Daniel V. Steenson, ISB #4332 Charles L. Honsinger, ISB #5240 S. Bryce Farris, ISB #5636 RINGERT LAW, CHTD. 455 S. Thirst St. P.O. Box 2773 Boise, Idaho 83701-2773 Telephone: (208) 342-4591 Facsimile: (208) 342-4657

Attorneys for Cross-Petitioner Blue Lakes Trout Farm, Inc.

IN THE DISTRICT COURT OF THE FIFTH JUDICIAL DISTRICT OF TH STATE OF IDAHO, IN AND FOR THE COUNTY OF GOODING

CLEAR SPRINGS FOODS, INC.,) Case No. 2008-0000444
Petitioner,)
VS.)
BLUE LAKES TROUT FARM, INC.,) SECOND AFFIDAVIT OF
Cross-Petitioner,) SUPPORT OF MOTION TO) ENFORCE ORDERS
VS.) ENFORCE ORDERS
IDAHO GROUND WATER APPROPRIATORS, INC., NORTH SNAKE GROUNDS WATER DISTRICT and MAGIC VALLEY GROUND WATER DISTRICT,))))
Cross-Petitioner,)
VS.)
IDAHO DAIRYMEN'S ASSOCIATION, INC.,))
Cross-Petitioner,))

SECOND AFFIDAVIT OF DANIEL V. STEENSON IN SUPPORT OF MOTION TO ENFORCE ORDERS - 1

VS.)
RANGEN, INC.,	·)
Cross-Petitioner,)
VS.)
DAVID R. TUTHILL, JR., in his capacity as Director of the Idaho Department of Water Resources, and THE DEPARTMENT OF WATER RESOURCES,))))))
Respondents.)
IN THE MATTER OF DISTRIBUTION OF WATER TO WATER RIGHTS NOS. 36-0413A, 36-04013B, and 36-07148,)))
(Clear Springs Delivery Call))
IN THE MATTER OF DISTRIBUTION OF WATER TO WATER RIGHTS NOS. 36-02356A, 36-07210, and 36-07427,))))
(Blue Lakes Delivery Call)) _) _)

STATE OF IDAHO)) ss COUNTY OF ADA)

DANIEL V. STEENSON, being first duly sworn upon his oath, deposes and says that:

1. I am an attorney of record for Cross-Petitioner Blue Lakes Trout Farm, Inc. ("Blue Lakes") in the above-captioned action, as well as attorney for Blue Lakes in proceedings before the Director of the Idaho Department of Water Resources ("Director") related to the Blue Lakes' water delivery call involved in the above-captioned action.

SECOND AFFIDAVIT OF DANIEL V. STEENSON IN SUPPORT OF MOTION TO ENFORCE ORDERS - 2

2. Exhibit A attached hereto is a true and correct copy of the complete transcript of the Deposition of Allan Haines Wylie, PH.D., taken on November 13, 2009.

Further your affiant sayeth naught.

Dated this \underline{b}^{+h} day of May, 2010.

Daniel V. Steenson

Ų day of May, 2010. Sworn to and subscribed before me this

Notary Public for Idaho Residing in <u>Dasis</u>, Idaho My Commission Expires: 2/20/14



SECOND AFFIDAVIT OF DANIEL V. STEENSON IN SUPPORT OF MOTION TO ENFORCE ORDERS - 3

CERTIFICATE OF SERVICE

I hereby certify that on this $\underline{\mu}$ day of May, 2010, I served a true and correct copy of the foregoing by delivering the same to each of the following individuals by the method indicated below, addressed as follows:

Deputy Clerk Gooding County District Court PO Box 27 Gooding, Idaho 83330

Snake River Basin Adjudication ATTN: Eric Wildman 253 3rd Ave. N. Twin Falls, ID 83303 <u>ewildman@srba.state.id.us</u>

Randall C. Budge Candice M. McHugh Racine, Olson, Nye, Budge & Bailey, Chtd. P.O. Box 1391 Pocatello, ID 83204 <u>rcb@racinelaw.net</u> cmm@rainelaw.net

Garrick L. Baxter Chris M. Bromley Deputy Attorneys General Idaho Department of Water Resources PO Box 83720 Boise, ID 83720-0098 garrick.baxter@idwr.idaho.gov chris.bromley@idwr.idaho.gov

Mike Creamer Jeff Fereday Givens Purlsey PO Box 2720 Boise, ID 83701-2720 jcf@givenspursley.com mcc@givenspursley.com [__] U.S. First Class Mail, Postage Prepaid

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SECOND AFFIDAVIT OF DANIEL V. STEENSON IN SUPPORT OF MOTION TO ENFORCE ORDERS- 4

Michael S. Gilmore Attorney General's Office PO Box 83720 Boise, ID 83720-0010 Mike.gilmore@ag.idaho.gov

J. Justin May May Sudweeks &Browning LLP 1419 W. Washington Boise, ID 83702 jimay@may-law.com

John K. Simpson Travis L. Thompson Paul L. Arrington BARKER, ROSHOLT and SIMPSON, LLP 113 Main Avenue West, Suite 303 P.O. Box 485 Twin Falls, ID 83303-0485 jks@idahowaters.com tlt@idahowaters.com pla@idahowaters.com

Robert E. Williams Fredericksen Williams Meservy P.O. Box 168 Jerome, ID 83338-0168 <u>rewilliams@cableone.net</u>

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1 Alternay

Daniel V. Steenson

SECOND AFFIDAVIT OF DANIEL V. STEENSON IN SUPPORT OF MOTION TO ENFORCE ORDERS- 5

EXHIBIT A

Page 1

BEFORE THE DEPARTMENT OF WATER RESOURCES

OF THE STATE OF IDAHO

IN THE MATTER OF DISTRIBUTION OF)
WATER TO WATER RIGHTS)
NOS. 36-04013A, 36-04013B, AND)
36-07148) Docket No.
(SNAKE RIVER FARM)) CM-MP-2009-004
(Water District Nos. 130 and 140))
Third Mitigation Plan)

DEPOSITION OF ALLAN HAINES WYLIE, PH.D.

NOVEMBER 13, 2009

REPORTED BY:

JEFF LaMAR, C.S.R. No. 640

Notary Public

	Page 2			Page 4
1	THE DEPOSITION OF ALLAN HAINES WYLIE, PH.D.,	1	I N D E X	
2	was taken on behalf of Clear Springs Foods. Inc.,	2		
3	at the offices of Barker, Rosholt & Simpson,	3	TESTIMONY OF ALLAN HAINES WYLIE, PH.D.	PAGE
4	1010 West Jefferson Street, Suite 102, Boise,	4	Examination by Mr. Simpson 6,141	
5	Idaho, commencing at 10:35 a.m. on November 13,	5	Examination by Mr. Steenson 93,146	
6	2009, before Jeff LaMar, Certified Shorthand	6	Examination by Mr. Bromley 129,148	
7	Reporter and Notary Public within and for the	7	Examination by Ms. McHugh 135	
8	State of Idaho, in the above-entitled matter.	8		
9		9	EXHIBITS	
10	APPEARANCES:	10	39 - Notice of Taking Deposition of Allan 6	
11	For Clear Springs Foods, Inc.:	11	Wylie, no Bates numbers	
12	BARKER, ROSHALT & SIMPSON LLP	12	40 - White Paper Technical Evaluation of 77	
13	BY MR. JOHN K. SIMPSON	13	Trim Line, dated 06/05/2009, no Bates	
14	1010 West Jefferson Street, Suite 102	14	numbers	
15	P.O. Box 2139	15	41 - Administrator's Memorandum from 90	
16	Boise, Idaho 83701-2139	16	G. Spackman to Water Management	
17	For North Snake Ground Water District and Magic	17	Division Staff, dated 01/21/2009, no	
18	Valley Ground Water District:	18	Bates numbers	
19	RACINE, OLSON, NYE, BUDGE & BAILEY, CHTD.	19	42 - Model uncertainty outline, Bates 94	
20	BY MS. CANDICE M. McHUGH	20	No. SRF 475	
21	101 Capitol Boulevard, Suite 208	21	43 - Definition of scientific method, no 94	
22	Boise, Idaho 83702	22	Bates numbers	
23	///	23	44 - Blue Lakes discharge graph, no Bates 112	
24	///	24	number	
25	///	25	///	
		The second s		
	Page 3			Page 5
1	Page 3	1	INDEX (Continued)	Page 5
1	Page 3 APPEARANCES (Continued)	1	I N D E X (Continued)	Page 5
1 2 3	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm:	1 2 3	INDEX (Continued)	Page 5
1 2 3 4	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED	1 2 3 4	I N D E X (Continued) EXHIBITS PAGE	Page 5
1 2 3 4 5	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR DANIEL V STEENSON	1 2 3 4 5	I N D E X (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers	Page 5
1 2 3 4 5 6	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR. DANIEL V. STEENSON 455 South Third Street	1 2 3 4 5 6	I N D E X (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers 46 - ESHMC Calibration Targets dated	Page 5
1 2 3 4 5 6 7	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR. DANIEL V. STEENSON 455 South Third Street P.O. Box 2773	1 2 3 4 5 6 7	I N D E X (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers 46 - ESHMC Calibration Targets, dated September 21-22, 2009, no Bates number	Page 5 120 123
1 2 3 4 5 6 7 8	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR. DANIEL V. STEENSON 455 South Third Street P.O. Box 2773 Boise, Idaho 83701	1 2 3 4 5 6 7 8	I N D E X (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers 46 - ESHMC Calibration Targets, dated September 21-22, 2009, no Bates numb	Page 5 120 123 pers
1 2 3 4 5 6 7 8 9	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR. DANIEL V. STEENSON 455 South Third Street P.O. Box 2773 Boise, Idaho 83701 For Idaho Department of Water Resources:	1 2 3 4 5 6 7 8 9	I N D E X (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers 46 - ESHMC Calibration Targets, dated September 21-22, 2009, no Bates numb	Page 5 120 123 pers
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1 2 3 4 5 6 7 8 9 10 11	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR. DANIEL V. STEENSON 455 South Third Street P.O. Box 2773 Boise, Idaho 83701 For Idaho Department of Water Resources: OFFICE OF ATTORNEY GENERAL BY MR. CHRIS M. BROMLEY	1 2 3 4 5 6 7 8 9 10	I N D E X (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers 46 - ESHMC Calibration Targets, dated September 21-22, 2009, no Bates numb	Page 5 120 123 pers
1 2 3 4 5 6 7 8 9 10 11	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR. DANIEL V. STEENSON 455 South Third Street P.O. Box 2773 Boise, Idaho 83701 For Idaho Department of Water Resources: OFFICE OF ATTORNEY GENERAL BY MR. CHRIS M. BROMLEY 322 East Front Street	1 2 3 4 5 6 7 8 9 10 11	I N D E X (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers 46 - ESHMC Calibration Targets, dated September 21-22, 2009, no Bates numb	Page 5 120 123 pers
1 2 3 4 5 6 7 8 9 10 11 12 13	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR. DANIEL V. STEENSON 455 South Third Street P.O. Box 2773 Boise, Idaho 83701 For Idaho Department of Water Resources: OFFICE OF ATTORNEY GENERAL BY MR. CHRIS M. BROMLEY 322 East Front Street P.O. Box 83720	1 2 3 4 5 6 7 8 9 10 11 12 13	I N D E X (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers 46 - ESHMC Calibration Targets, dated September 21-22, 2009, no Bates numb	Page 5 120 123 pers
1 2 3 4 5 6 7 8 9 10 11 12 13 14	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR. DANIEL V. STEENSON 455 South Third Street P.O. Box 2773 Boise, Idaho 83701 For Idaho Department of Water Resources: OFFICE OF ATTORNEY GENERAL BY MR. CHRIS M. BROMLEY 322 East Front Street P.O. Box 83720 Boise, Idaho 83720-0098	1 2 3 4 5 6 7 8 9 10 11 12 13 14	I N D E X (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers 46 - ESHMC Calibration Targets, dated September 21-22, 2009, no Bates numb	Page 5 120 123 pers
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$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\end{array} $	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR. DANIEL V. STEENSON 455 South Third Street P.O. Box 2773 Boise, Idaho 83701 For Idaho Department of Water Resources: OFFICE OF ATTORNEY GENERAL BY MR. CHRIS M. BROMLEY 322 East Front Street P.O. Box 83720 Boise, Idaho 83720-0098 Also Present: John Koreny Charles E. Brockway	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\11\\12\\13\\14\\15\\16\\17\end{array} $	INDEX (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers 46 - ESHMC Calibration Targets, dated September 21-22, 2009, no Bates numb	Page 5 120 123 pers
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$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\1\\1\\1\\2\\1\\4\\1\\5\\1\\6\\1\\7\\1\\8\\9\\2\\1\end{array} $	Page 3 APPEARANCES (Continued) For Blue Lakes Trout Farm: RINGERT LAW CHARTERED BY MR. DANIEL V. STEENSON 455 South Third Street P.O. Box 2773 Boise, Idaho 83701 For Idaho Department of Water Resources: OFFICE OF ATTORNEY GENERAL BY MR. CHRIS M. BROMLEY 322 East Front Street P.O. Box 83720 Boise, Idaho 83720-0098 Also Present: John Koreny Charles E. Brockway	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\0\\11\\12\\13\\14\\5\\16\\17\\18\\9\\21\end{array} $	INDEX (Continued) EXHIBITS PAGE 45 - Various discharge graphs, no Bates numbers 46 - ESHMC Calibration Targets, dated September 21-22, 2009, no Bates numb	Page 5 120 123 pers
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2 (Pages 2 to 5)

	Page 6		Page 8
1	ALLAN HAINES WYLIE PH D	1	Ω And on the second page of that notice
2	first duly sworn to tell the truth relating to	2	it identifies certain matters for which you're
3	said cause, testified as follows:	3	here today to testify on?
4		4	A. Yes.
5	EXAMINATION	5	O Okay. And with respect to that list
6	BY MR. SIMPSON:	6	of matters, are you presently able to testify as
7	O. Good morning, Mr. Wylie.	7	to those matters described in that document?
8	A. Good morning.	8	A. Yes. I looked through this the
9	O. My name is John Simpson, and I'm here	9	things you mention here.
10	today representing Clear Springs Foods in regards	10	O. Okav. Fair enough. Are there any
11	to the third mitigation plan filed by the ground	11	matters that are identified there which you don't
12	water districts.	12	believe that today you'll be able to testify to?
13	And we're going to mark as an exhibit,	13	A. No.
14	the notice, if we could. I believe that will be	14	O. Okay. Some background information,
15	39.	15	Mr. Wylie.
16	(Exhibit 39 marked.)	16	Do you recall generally your testimony
17	Q. (BY MR. SIMPSON): And for the record,	17	that you provided in the spring user delivery
18	Mr. Wylie, can you spell your last name for the	18	case? That is
19	record, please.	19	A. Yes.
20	A. W-y-l-i-e.	20	Q you recall giving testimony;
21	Q. And, Mr. Wylie, you've had your	21	correct?
22	deposition taken in a number of proceedings	22	A. Correct.
23	regarding the delivery calls in the Thousand	23	Q. And do you recall giving testimony
24	Springs reach; correct?	24	regarding the boundaries of the ESPA?
25	A. That's correct.	25	A. Yes.
	Page 7		Page 9
1		1	
	Q. Okay. And you re sini an employee of		Q. Okay. And with respect to that
2	A That's correct	2	hetware the ESDA and the Snake Diver in the
	A. That's correct.		Thousand Springs reach specifically? Maybe I
5	since your last deposition?	1	
5		1 5	should say generally do you recall as part of
16	A That's correct	5	should say, generally do you recall as part of that testimony describing the interface between
67	A. That's correct.	5 6 7	should say, generally do you recall as part of that testimony describing the interface between the ESPA and the Spake River and the Thousand
6 7 8	A. That's correct. Q. Okay. And you recall your last deposition was taken October of 20082 Does that	5 6 7 8	should say, generally do you recall as part of that testimony describing the interface between the ESPA and the Snake River and the Thousand Springs reach?
6 7 8 9	A. That's correct. Q. Okay. And you recall your last deposition was taken October of 2008? Does that sound right?	5 6 7 8 9	should say, generally do you recall as part of that testimony describing the interface between the ESPA and the Snake River and the Thousand Springs reach?
6 7 8 9 10	A. That's correct. Q. Okay. And you recall your last deposition was taken October of 2008? Does that sound right? A. That's plausible, yes. I didn't look	5 6 7 8 9	should say, generally do you recall as part of that testimony describing the interface between the ESPA and the Snake River and the Thousand Springs reach? A. Yes. O And that similar to other areas of the
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3 (Pages 6 to 9)

Page	10
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1	Garabedian?	1	Q. Okay. So the Banbury basalts have
2	A. Yes.	2	been recategorized into other names and further
3	Q. And it generally described the	3	describing or breaking down the Banbury basalts
4	boundaries of the ESPA; correct?	4	into distinct groups?
5	A. Yes.	5	A. Yes.
6	Q. Okay. And there's been some further	6	Q. Okay. But all those basalts are still
7	development of the boundaries of the ESPA in the	7	recognized as part of the ESPA?
8	Oakley Fan area; is that correct?	8	A. As Garabedian tried to define it,
9	A. Do you mean the Eastern Snake	9	they're quaternary basalts are what he called the
10	hydrologic modeling committee has different	10	Eastern Snake Plain Aquifer, and the tertiary
11	boundaries on the model than what Garabedian did?	11	the older tertiary-age basalts were not. He
12	Q. Yes.	12	believed there was very limited interaction
13	A. That's correct.	13	between the quaternary-age basalts and the
14	Q. Okay. And is one of the primary areas	14	tertiary-age basalts.
15	that Oakley Fan area?	15	Q. Uh-huh. The existing understanding by
16	A. It's different in the Oakley Fan area,	16	the modeling committee is that those basalts
17	correct.	17	formerly recognized as the Banbury basalts are
18	O. Okay. But with respect to the reaches	18	still recognized as part of the ESPA and
19	of the Snake River below Milner and its interface	19	considered such by the model?
20	with the ESPA, that hasn't changed over time, has	20	A. Perhaps, is the best answer to that.
21	it?	21	When the committee has decided that the edge is
22	A. How the river interacts with the	22	at the rim, so below the rim the any basalts.
23	aguifer below Milner is substantially the same	23	tertiary or quaternary, below the rim are not part
24	with the Department's model and the Garabedian	24	of the Eastern Snake Plain Aguifer.
25	model.	25	The heads in below the rim, whether
	D 11	-	
	Page II		Page 13
1	Q. Okay. Both the model and the	1	they're in unconsolidated sediments, quaternary
2	Department's understanding is that, as you	2	basalts, or tertiary basalts seem to reflect the
3	described just a moment ago, that the ESPA	3	elevation of the Snake River and not the elevation
4	discharges directly into the Snake River in the	4	of the Eastern Snake Plain Aquifer.
5	reaches below Milner Dam; correct?	5	Q. So in those lower basalts
6	A. That's correct.	6	A. Uh-huh.
7	Q. Okay. Mr. Wylie, in those areas of	7	Q formerly I'm having a problem,
8	the ESPA that are connected to the Snake River	8	because I recognized them as the Banbury basalts.
9	below Milner Dam, are you familiar with the	9	A. We can call them the "Banbury."
10	Banbury basalts?	10	Q. Let's just continue for ease of my
11	A. Yes.	11	lack of understanding to continue that.
12	Q. And that terminology described as the	12	Those Banbury basalts, water that
13	Banbury basalts?	13	discharges from those Banbury basalts, does it
14	A. I'm familiar with the terminology.	14	continue to discharge into the Snake River?
15	It's been remapped, and they're no longer called	15	A. Yes.
16	Banbury basalts.	16	Q. Okay. And so does some of that water
17	Q. Okay. What are they now called?	17	have as its source the ESPA?
18	A. There are different names. They were	18	A. In a roundabout way. If it came from
19	remapped recently by the Idaho Geological Survey.	19	the discharge from the ESPA, went into the Snake
20	Q. Okay.	20	River, and then moved from the Snake River into
21	A. They've broken them up into	21	these basalts below the rim, if that's what you're
22	formerly most old basalts, tertiary-age basalts,	22	talking about, then that's a distinct possibility.
23	were just classed as Banbury. And now they have	23	But if these basalts below the rim
24	different names for different groups of the older	24	had were flowing, had flowing wells, there was
	hanalta	25	a tendency for them to be artegion where the water

4 (Pages 10 to 13)

	Page 14		Page 16
1	came up above land surface, then the committee	1	A That's correct
2	would have felt that that was water that was	2	O Okay But would you not conclude that
3	coming directly from the ESPA through these older	2	there is still some interaction between the upper
Λ	hospita and then discharging. And that		and the lower begalta younger begalta and the
г 5	opposionally homony. One event la would be Plue	Г Т Г	lower bogolts in terms of water flow?
6	Usert Servings	6	Iower basaits in terms of water now?
7	The angle on other exercises that the exercise		A. It's it's probably also dampened
6	finere's another example that I'm aware		because there's a significant age difference
	of where there's a flowing well below the fiff.		there. There's likely a sediment deposit between
10	But for the most part, wells below the rim have	10	the younger basalts and the older basalts, also
	much lower neads. And the committee did looked		insulating.
	at a study by Dr. Dale Raiston where he collected		There's some instances that I know of
	elevations of wells in the Hagerman Valley and		coming down the grade, to the Buhl grade, you can
13	water levels from wells in the Hagerman Valley.	13	see that interface between the younger basalts and
14	And they don't rise up to the level of the Eastern	14	the older basalts. And there isn't much of a
15	Snake Plain Aquifer. They are more reflective of	15	sediment layer there.
10	the level of water in the river.	116	So we can't say conclusively that
	So the committee concluded that wells		there's always a sediment layer. But in many
18	below the rim aren't reflective and don't deplete	18	instances there is.
19	the Eastern Snake Plain Aquifer.	19	Q. Uh-huh.
20	Q. Okay. When you say "the committee,"	20	A. It's in most things like most
21	that's the ESPAM technical committee?	21	things hydrogeologic, it's not a clean cut. But
22	A. Yes.	22	there's a great deal of evidence suggesting it's
23	Q. Okay. Okay. And they reached that	23	not a strong communication.
24	conclusion when? In 2009 or in prior years?	24	Q. Okay. And that work you identified
25	A. Oh, certainly 2008.	25	references Dr. Ralston's investigation?
	Page 15		Page 17
1	Page 15 O. Okay.	1	Page 17 A. Yes.
1 2	Page 15 Q. Okay. A. The summer of 2008.	1 2	Page 17 A. Yes. Q. Okay. Is that a document that you
1 2 3	Page 15 Q. Okay. A. The summer of 2008. O. Okay. So the reflection of the ground	1 2 3	Page 17 A. Yes. Q. Okay. Is that a document that you have?
1 2 3 4	Page 15 Q. Okay. A. The summer of 2008. Q. Okay. So the reflection of the ground water elevations in the basalts below the canyon	1 2 3 4	Page 17 A. Yes. Q. Okay. Is that a document that you have? A. It's on the modeling committee the
1 2 3 4 5	Page 15 Q. Okay. A. The summer of 2008. Q. Okay. So the reflection of the ground water elevations in the basalts below the canyon rim is, in your view, more reflective of the river	1 2 3 4 5	Page 17 A. Yes. Q. Okay. Is that a document that you have? A. It's on the modeling committee the ESHMC web page.
1 2 3 4 5 6	Page 15 Q. Okay. A. The summer of 2008. Q. Okay. So the reflection of the ground water elevations in the basalts below the canyon rim is, in your view, more reflective of the river elevation than it is necessarily the elevation	1 2 3 4 5 6	Page 17 A. Yes. Q. Okay. Is that a document that you have? A. It's on the modeling committee the ESHMC web page. Q. Okay. Fair enough. Dr. Wylie, I want
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5 (Pages 14 to 17)

1	Page 18		Page 20
1	in that calculation or analysis?	1	Q. (BY MR. SIMPSON): Well, let me just
2	A. Yes.	2	finish that.
3	Q. Okay.	3	In your view, since you identified
4	MS. McHUGH: I'm just going to object to	4	that the existing spring percentage analysis was
5	this line of questioning as being not relevant for	5	not rigorous, would you support a more rigorous
6	the December 7th hearing, understanding that maybe	6	analysis?
7	it's relevant for some future hearing.	7	A. I'm quite content leaving it as an
8	Q. (BY MR. SIMPSON): Do you recall that	8	administrative decision, that as long as the
9	your statement in that case was that that analysis	9	committee feels the best thing to do is to predict
10	was not rigorous?	10	to the reach, then the next director or the
11	A. Yes.	11	current director, or whatever, is has their
12	Q. Okay. And in fact, didn't you admit	12	discretion on how to predict to the spring, what
13	in that testimony that you could not defend it?	13	kind of an adjustment necessary to go to the
14	A. Yes.	14	spring.
15	Q. And based upon those statements, would	15	Q. Okay. Is it still your position that
16	it be fair to say that a more rigorous analysis	16	you wouldn't defend the spring percentage method?
17	might be one easier to defend?	17	A. I would not, no.
18	A. Oh, I view that as a post-modeling	118	Q. Okay. Have you had an opportunity to
19	administrative adjustment. And I don't think I'm	19	review the regression analysis offered for review
20	required to defend it.	20	by Dr. Brockway?
21	Q. Fair enough. I'm not here today		A. Yes. $(1, 1)$
22	asking you to defend it.	22	Q. Okay. Initially is that analysis more
23	But what I am asking is that because	23	rigorous from your perspective than the spring
24	of your acknowledgment that it wasn't a rigorous	24	percentage method?
25	analysis, would you agree it was pernaps at that	125	A. It's we talked, I believe the last
	Page 19		Page 21
			5
1	point in time an analysis that had to be completed	1	hearing, about Laura Janczak's thesis. And Eric
1 2	point in time an analysis that had to be completed in terms of the administrative hearing process?	1 2	hearing, about Laura Janczak's thesis. And Eric Harmon, yes, did a similar regression analysis.
1 2 3	point in time an analysis that had to be completed in terms of the administrative hearing process?A. Director Dreher felt the need to	1 2 3	hearing, about Laura Janczak's thesis. And Eric Harmon, yes, did a similar regression analysis. And that was presented to the hearing officer.
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$\begin{array}{c}1\\2&3\\4&5\\6&7\\8&9\\0&11\\2&3&4\\1&1&5\\1&1&1&2\\2&2&3&4\\2&5\end{array}$	 point in time an analysis that had to be completed in terms of the administrative hearing process? A. Director Dreher felt the need to supply that analysis. Q. Okay. And if there was a different or a more rigorous analysis of the relationship between actions on the aquifer and the results showing up in individual springs, is that something that you would entertain and perhaps defend? MR. BROMLEY: Calls for a legal conclusion. THE WITNESS: Much of much of what I do is at the request of the director. And, you know, I might be able to dream up something, but it might not be acceptable to whoever the next director might be. So I'm reluctant to say something that might come up would be acceptable. Q. (BY MR. SIMPSON): Okay. A. But it's possible that something more technically defensible could be presented. But I can't say that the Department would adopt it. Q. Would you not recognize that if there is something more scientifically defensible it should be considered, in your view? MR. BROMLEY: Calls for a legal conclusion. 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\9\\20\\22\\23\\24\\25\end{array} $	 hearing, about Laura Janczak's thesis. And Eric Harmon, yes, did a similar regression analysis. And that was presented to the hearing officer. Q. Right. And the Laura Janczak analysis you referenced in your prior deposition taken a year ago? A. Correct. Q. Okay. And upon request by counsel for ground water districts, you provided them a copy of that analysis, if you recall? A. I don't recall that, but Q. Okay. And is the point of your response that that analysis by Ms. Janczak was similar to what Dr. Brockway's regression analysis was? A. The head in the aquifer versus discharge in the spring. Q. Okay. And generally speaking, do you agree conceptually with that relationship? A. Conceptually, yes. Q. Okay. And with respect to Ms. Janczak's work, did you agree with the work that she completed? A. Agree with? I O. Well, you reviewed it?

6 (Pages 18 to 21)

1 A. Yes. I wasn't on her committee, so I 2 didn't have any 3 Q. But you reviewed the document that you 4 had available to you of her work; correct? 5 A. Correct, yes. 6 Q. Okay, As you sit here, were there 7 portions of that work that you din outgarece with? 8 A. I didn't I don't have any problem 9 were unvise in other parts. But the regression analysis that she did. I 10 thought there were striches that as be made that 11 were unvise in other parts. But the regression analysis is that she did. I 12 q. Okay. Would you agree that this 13 regression analysis that she did. I 14 the relationship between spring flows and ground 15 including Dr. Brockway, more closely represents 16 spring percentage calculation? 17 Q. Nay. So how would we get how 18 applied to all spring procentage - which was a linear 19 A. Correct. 20 Q. And assume that that linear aspect 21 applied to all spring flows in relationship to there and that would be concerdian the spring gret maity for that waset beardiffer with the spri		Page 22		Page 24
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7 (Pages 22 to 25)

	Page 26		Page 28
1	O. You're talking about the Brockway	1	of well data regarding acuifer levels at that
2	analysis: correct?	2	particular well?
3	A. Yes.	3	A. Yes, lots of measurements.
4	O. Okav.	4	O. Okay. And by "lots," that's a pretty
5	A. So you'd have to find a well with a	5	technical term, can you give me a little more
6	lot of sufficient dataset, and then you'd have	6	definition?
7	to be able to have the model predict head changes	7	A. Let's say at least quarterly
8	at that well pretty accurately. And, you know,	8	measurements near the rim. The Department, has
9	that would be that would be something I would	9	since calibration of version 1 of the model, has
10	want to be confident in before I would endorse	10	started collecting more water-level measurements
11	endorse this.	11	along that Thousand Spring reach.
12	O. Okay. So you've identified a couple	12	O. Okay. But isn't it true that whatever
13	reservations.	13	data was associated with the wells for which the
14	I'll describe them as	14	data was put into the model, the model was
15	A. Yes	15	calibrated to that data?
16	$\Omega_{\rm r}$ first being having a well with a	16	A. The model was calculated to whatever
17	sufficient dataset: correct?	17	data we had.
18	A Yes	18	O Right. So if a well had 10 years of
19	O And then having	19	history on annual measurements, the model was
20	A. And co-located.	20	still calibrated to that well with those annual
21	O. Okay. And "co-located" meaning?	21	measurements: correct?
22	A. Close very close to the spring	22	A Correct.
23	O. Okay. And the second reservation was	23	O. Or if it had 20 years of history with
24	that the model had the ability to predict changes	24	measurements taken semiannually, the model was
25	in head at that particular well?	25	calibrated to that well; correct?
	Page 27		Page 29
1	Page 27	1	Page 29
1	Page 27 A. Correct.	1	Page 29 A. Correct.
1 2 3	Page 27 A. Correct. Q. Okay. And does the model have the ability to predict changes in head in particular	1 2 3	Page 29 A. Correct. Q. So whatever the dataset was, the model was calibrated to it?
1 2 3 4	Page 27 A. Correct. Q. Okay. And does the model have the ability to predict changes in head in particular wells within the ESPA as the model's calibrated?	1 2 3 4	Page 29 A. Correct. Q. So whatever the dataset was, the model was calibrated to it? A. That's correct
1 2 3 4 5	A. Correct. Q. Okay. And does the model have the ability to predict changes in head in particular wells within the ESPA as the model's calibrated?	1 2 3 4 5	Page 29 A. Correct. Q. So whatever the dataset was, the model was calibrated to it? A. That's correct. Q. So that if there's a limitation in a
1 2 3 4 5 6	A. Correct. Q. Okay. And does the model have the ability to predict changes in head in particular wells within the ESPA as the model's calibrated? A. Version 1.1? Q. Well the latest version	1 2 3 4 5 6	Page 29 A. Correct. Q. So whatever the dataset was, the model was calibrated to it? A. That's correct. Q. So that if there's a limitation in a dataset perhaps that's simply the lack of data
1 2 3 4 5 6 7	A. Correct. Q. Okay. And does the model have the ability to predict changes in head in particular wells within the ESPA as the model's calibrated? A. Version 1.1? Q. Well, the latest version. A. Well version 1.1 is what we're	1 2 3 4 5 6 7	Page 29 A. Correct. Q. So whatever the dataset was, the model was calibrated to it? A. That's correct. Q. So that if there's a limitation in a dataset, perhaps that's simply the lack of data, but the model was still calibrated to the best
1 2 3 4 5 6 7 8	A. Correct. Q. Okay. And does the model have the ability to predict changes in head in particular wells within the ESPA as the model's calibrated? A. Version 1.1? Q. Well, the latest version. A. Well, version 1.1 is what we're working on	1 2 3 4 5 6 7 8	Page 29 A. Correct. Q. So whatever the dataset was, the model was calibrated to it? A. That's correct. Q. So that if there's a limitation in a dataset, perhaps that's simply the lack of data, but the model was still calibrated to the best dataset that you had available to you: right?
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1 recall specifically where those wells were in 1 A. The - their - the existence of spring complexes is not complex - the existence of spring complexes is not more of the 2 proximity to the Snake River Farms, would that, in your view, be a close enough proximity? 0 Okay. If they were in the next cell 0 Okay. But would you agree with me 10 adjacent or next cells adjacent to those cells 0 Okay. If they were in the next cell 0 Okay. 0 11 A. That's orrect. 0 Okay. But would you agree with me 12 adjacent or next cells adjacent to those cells 10 A. But maybe I'm just dense. 12 close ato the cargon rim, would that be in close 11 D. Okay. The would depend on where 13 A. The's chart would depend on where 13 Spring the more that analysis is going to - 14 Considered in coming up to the conclusion that the 14 the same conductants, the robustness with 15 math spring disacharge responds. 15 and where mitiape out the source of water for snake River Farms are a spring 20 And that springs in a reach have 16 which the spring precentage 20 And the's spring the more that the source of water for snake River Farms are a spring 2		Page 30		Page 32
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9 (Pages 30 to 33)

	Page 34		Page 36
1	like my job. I'm not inclined to put a director.	1	O. So would it be fair to say the only
2	future director in a box Post-modeling	2	limitation in that analysis that you observed in
3	analysis post-modeling administrative	3	your review of it, was that it had a limited time
4	adjustments in my view are the job of the	4	frame in terms of the data collected?
5	director	5	A And ves.
6	O (BY MR. SIMPSON). Well, if asked to	6	O Okay.
7	review the merits of a regression analysis by a	7	A Yes And that's just the way the data
8	post-administrative-order director, would you	8	is.
9	think that analysis has merit?	9	O. That's fairly consistent with all the
10	A It as I said, it has an appeal	10	data on the ESPA, where you'd always like to have
11	ves.	11	more data to put into the model: correct?
12	O. Okay. With respect to Dr. Brockway's	12	A. Yes, generally modelers would like
13	regression analysis at Snake River Farms and at	13	more data.
14	that complex, does it, in your view, represent a	14	O. Okav. If you know, Dr. Wylie, are
15	relationship between spring flows at the Snake	15	there any other procedures that have been
16	River complex and ground water level changes in	16	identified to compute individual flow impacts?
17	the ESPA?	17	A. There are analyses analytical
18	A. Yes.	18	solutions.
19	Q. Okay. Is it one that's scientifically	19	Q. Okay. Have you attempted to use any
20	based?	20	of those other procedures?
21	A. I didn't see a problem with that.	21	A. Not not for Snake River Farms.
22	Q. Okay. Is it based upon sound science?	22	I've done them in other instances.
23	A. I thought it was okay, yes.	23	Q. Okay. Have you used a similar
24	Q. You didn't find any problem, from your	24	regression analysis that Dr. Brockway identified
25	perspective, with that analysis?	25	at any other complex or in any other reach of the
	Page 35		Page 37
1	Page 35 A. No.	1	Page 37 Snake River?
1 2	Page 35 A. No. O. Okay.	12	Page 37 Snake River? A. I've I've used the staging aquifer
1 2 3	Page 35 A. No. Q. Okay. MR. BROCKWAY: Do you want me to leave?	1 2 3	Page 37 Snake River? A. I've I've used the staging aquifer spring discharge. With wells when I was at the
1 2 3 4	Page 35 A. No. Q. Okay. MR. BROCKWAY: Do you want me to leave? MR. SIMPSON: No. I'm hoping he'll tell	1 2 3 4	Page 37 Snake River? A. I've I've used the staging aquifer spring discharge. With wells when I was at the University of Idaho, I had a series of transducers
1 2 3 4 5	Page 35 A. No. Q. Okay. MR. BROCKWAY: Do you want me to leave? MR. SIMPSON: No. I'm hoping he'll tell the truth about it.	1 2 3 4 5	Page 37 Snake River? A. I've I've used the staging aquifer spring discharge. With wells when I was at the University of Idaho, I had a series of transducers in wells along the rim. And we had we gauged
1 2 3 4 5 6	Page 35 A. No. Q. Okay. MR. BROCKWAY: Do you want me to leave? MR. SIMPSON: No. I'm hoping he'll tell the truth about it. MS. McHUGH: I think you were trying to get	1 2 3 4 5 6	Page 37 Snake River? A. I've I've used the staging aquifer spring discharge. With wells when I was at the University of Idaho, I had a series of transducers in wells along the rim. And we had we gauged some springs and used USGS gauge data. And that
1 2 3 4 5 6 7	Page 35 A. No. Q. Okay. MR. BROCKWAY: Do you want me to leave? MR. SIMPSON: No. I'm hoping he'll tell the truth about it. MS. McHUGH: I think you were trying to get him to adopt it.	1 2 3 4 5 6 7	Page 37 Snake River? A. I've I've used the staging aquifer spring discharge. With wells when I was at the University of Idaho, I had a series of transducers in wells along the rim. And we had we gauged some springs and used USGS gauge data. And that was either shortly before or shortly after Laura
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10 (Pages 34 to 37)

	Page 38		Page 40
1	A It was after Laura's thesis because I	1	O And I think you just identified that
2	then went to work for the Department	2	portion of the aquifer that portion of the
3	O All right	3	acuifer where that well was located correct?
4	A But I still probably somewhere have	4	A Correct
5	that data	5	O Okay And so with respect to those
6	O Okay Well if you could find that	6	wells that you were utilizing did you have a
7	for us that would be great	7	history of data associated with those wells?
8	A My main interest was which wells	8	A Pretty short history Two three
9	worked best with which springs and in an attempt	9	vears
10	to figure out which part of the aquifer was	110	Ω Okay But in terms of for that study
11	influencing which springs	11	that was an adequate dataset for you to complete
12	O Okay And so when you said you wanted	12	that regression analysis that you were working on?
13	to find out which wells were influencing which	13	A Ves
14	springs and you completed the regression	14	Ω Okay
15	analysis?	115	Δ One of the limitations of a regression
16	Δ Vec	16	analysis is that it's not a physically based
17	O In order to help you make that	17	model So you become very nervous if you're
18	determination did you have a certain criteria	18	extrapolating much beyond your dataset
19	with respect to that relationship that indicated	19	Ω We don't want to be pervous
20	to you there was you know a good relationship or	20	Doctor what do you believe is the
21	a very good relationship between the well and the	21	uncertainty in the FSPAM relative to simulations
22	spring? What numbers were you looking at I	22	of Snake River reach gains?
23	guess?	23	A The river?
24	A. You could very plainly see a	24	O Yeah, reach gains of the river.
25	hysteresis develop. That stage in the aquifer	25	A. The analysis that I gave to former
	Page 30	1	
-		-	raye 41
1	didn't do a very good job forecasting discharge in	1	director Karl Dreher says 10 percent.
1 2	didn't do a very good job forecasting discharge in the spring.	1 2	director Karl Dreher says 10 percent. Q. Okay. And you still believe that
1 2 3	didn't do a very good job forecasting discharge in the spring. In some instances discharge in the	1 2 3	director Karl Dreher says 10 percent. Q. Okay. And you still believe that today?
1 2 3 4	didn't do a very good job forecasting discharge in the spring. In some instances discharge in the spring would lead to change in the aquifer, and	1 2 3 4	director Karl Dreher says 10 percent. Q. Okay. And you still believe that today? A. That's as good a number as we have
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11 (Pages 38 to 41)

	Page 42		Page 44
1	in a reach? Certainly if the reach is small	1	A. That would be to have it be plus or
2	enough and the stage in the river is fairly	2	minus a tenth of a foot, you would have to have
3	constant.	3	pretty shallow wells, and they would have to all
4	O. (BY MR. SIMPSON): And so those are	4	be surveyed.
5	the very same reasons why it's applicable as	5	Q. Was that accuracy better than plus or
6	between a spring and aquifer level changes?	6	minus 10 percent?
7	A. Yes.	7	A. Probably.
8	Q. Okay. Do you believe that the	8	Q. Better than plus or minus 5 percent?
9	accuracy in the simulation of water levels in the	9	A. I would guess more like plus or minus
10	ESPA is greater or less than the accuracy in the	10	2 percent.
11	simulations of the Snake River reach gains?	11	Q. Okay. Fair enough. You identified
12	A. I used to know this. They the	12	some work that you did after Ms. Janczak completed
13	output from the calibration run gives you the	13	her work, and regarding the relationship or
14	statistics. And I'm not I'm not recalling I	14	correlating between individual spring flows and
15	believe that the statistics for the head matches	15	water levels.
16	were better. It makes sense. There's a lot less	16	Are there other examples in which
17	noise in the head data than in the reach gains.	17	you've completed that work, other than what you've
18	Q. Well, what is the accuracy of the	18	just described for us?
19	measurements of water levels in the ESPA which	19	A. I don't believe so.
20	were used to calibrate the model?	20	Q. Okay. Other than reviewing
21	A. The water-level measurements by	21	Dr. Brockway's regression analysis and
22	convention are widely believed to be within a	22	Ms. Janczak's analysis, do you know of other
23	hundredth of a foot. The elevation of the wells	23	regression analyses that were undertaken?
24	is less certain. The wells that weren't surveyed,	24	A. Eric Harmon's.
25	we picked elevations off of digital elevation	25	Q. Okay. And other than Mr. Harmon's,
	Page 43		Page 45
1	Page 43 models.	1	Page 45 any others?
1 2	Page 43 models. And we did an analysis where we	1 2	Page 45 any others? A. Presumably, since that very equation
1 2 3	Page 43 models. And we did an analysis where we compared surveyed wells with the elevations	1 2 3	Page 45 any others? A. Presumably, since that very equation is used in McDonald and Harbaugh Modflow I'm
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1 2 3 4 5	Page 43 models. And we did an analysis where we compared surveyed wells with the elevations obtained from the digital elevation models. And they were within 2 feet, 2.3 feet, I believe.	1 2 3 4 5	Page 45 any others? A. Presumably, since that very equation is used in McDonald and Harbaugh Modflow I'm sorry, Modflow, the it's been and Modflow and written in the '80s.
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$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\1\\1\\1\\2\\1\\3\\1\\4\\5\\1\\6\\1\\7\\1\\8\\9\\0\end{array} $	Page 43 models. And we did an analysis where we compared surveyed wells with the elevations obtained from the digital elevation models. And they were within 2 feet, 2.3 feet, I believe. And then there's the issue of well trueness, which is I've seen where a well wells are rarely perfectly straight down. They typically wander around in kind of like a corkscrew. And if the driller isn't very careful, those vertical corrections, I've seen them around 8 feet. So throwing all of that together, the estimate on water levels would depend on how deep the well is. The deeper the well is, the more problem you have with the trueness, and whether or not the well was surveyed or elevation was picked off the digital elevation model. Q. In terms of the accuracy of the water	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\19\\20\end{array} $	Page 45 any others? A. Presumably, since that very equation is used in McDonald and Harbaugh Modflow I'm sorry, Modflow, the it's been and Modflow and written in the '80s. 1989? MR. BROCKWAY: Around there. THE WITNESS: You know, that must have come from somebody's observations, so the technique Q. (BY MR. SIMPSON): It's pretty widely accepted? A. Correct. Q. Okay. If you were told that a correlation between a historical target spring flow and a USGS observation well had a linear R2 of .91, would that be a good correlation? A. Yes. Q. And that would be consistent with your previous statement that an R2 above .8 would be a
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$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\9\\20\\22\\22\\22\\22\\22\\22\\22\\22\\22\\22\\22\\22\\$	Page 43 models. And we did an analysis where we compared surveyed wells with the elevations obtained from the digital elevation models. And they were within 2 feet, 2.3 feet, I believe. And then there's the issue of well trueness, which is I've seen where a well wells are rarely perfectly straight down. They typically wander around in kind of like a corkscrew. And if the driller isn't very careful, those vertical corrections, I've seen them around 8 feet. So throwing all of that together, the estimate on water levels would depend on how deep the well is. The deeper the well is, the more problem you have with the trueness, and whether or not the well was surveyed or elevation was picked off the digital elevation model. Q. In terms of the accuracy of the water levels in the ESPA to calibrate the model, was that accuracy identified as a tenth of a foot, plus or minus a tenth of a foot?	1 2 3 4 5 6 7 8 9 10 11 23 14 15 16 17 18 9 20 21 22 22	Page 45 any others? A. Presumably, since that very equation is used in McDonald and Harbaugh Modflow I'm sorry, Modflow, the it's been and Modflow and written in the '80s. 1989? MR. BROCKWAY: Around there. THE WITNESS: You know, that must have come from somebody's observations, so the technique Q. (BY MR. SIMPSON): It's pretty widely accepted? A. Correct. Q. Okay. If you were told that a correlation between a historical target spring flow and a USGS observation well had a linear R2 of .91, would that be a good correlation? A. Yes. Q. And that would be consistent with your previous statement that an R2 above .8 would be a good correlation; correct? A. Correct. Q. Do you believe it would be possible to actionate individual carries of actions the
$1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 5 \\ 16 \\ 17 \\ 18 \\ 9 \\ 20 \\ 22 \\ 23 \\ 4 \\ 15 \\ 16 \\ 17 \\ 18 \\ 9 \\ 20 \\ 22 \\ 23 \\ 4 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 $	Page 43 models. And we did an analysis where we compared surveyed wells with the elevations obtained from the digital elevation models. And they were within 2 feet, 2.3 feet, I believe. And then there's the issue of well trueness, which is I've seen where a well wells are rarely perfectly straight down. They typically wander around in kind of like a corkscrew. And if the driller isn't very careful, those vertical corrections, I've seen them around 8 feet. So throwing all of that together, the estimate on water levels would depend on how deep the well is. The deeper the well is, the more problem you have with the trueness, and whether or not the well was surveyed or elevation was picked off the digital elevation model. Q. In terms of the accuracy of the water levels in the ESPA to calibrate the model, was that accuracy identified as a tenth of a foot, plus or minus a tenth of a foot? A. I don't think that the committee diameted that	1 2 3 4 5 6 7 8 9 10 11 23 4 5 6 7 8 9 10 11 23 14 15 16 17 18 9 20 21 22 34	Page 45 any others? A. Presumably, since that very equation is used in McDonald and Harbaugh Modflow I'm sorry, Modflow, the it's been and Modflow and written in the '80s. 1989? MR. BROCKWAY: Around there. THE WITNESS: You know, that must have come from somebody's observations, so the technique Q. (BY MR. SIMPSON): It's pretty widely accepted? A. Correct. Q. Okay. If you were told that a correlation between a historical target spring flow and a USGS observation well had a linear R2 of .91, would that be a good correlation? A. Yes. Q. And that would be consistent with your previous statement that an R2 above .8 would be a good correlation; correct? A. Correct. Q. Do you believe it would be possible to estimate individual spring-flow impacts using the ESDAM aimulated around water laws a surger.
$1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 1 \\ 1 \\ 2 \\ 1 \\ 3 \\ 1 \\ 4 \\ 1 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 1 \\ 3 \\ 1 \\ 5 \\ 1 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2$	Page 43 models. And we did an analysis where we compared surveyed wells with the elevations obtained from the digital elevation models. And they were within 2 feet, 2.3 feet, I believe. And then there's the issue of well trueness, which is I've seen where a well wells are rarely perfectly straight down. They typically wander around in kind of like a corkscrew. And if the driller isn't very careful, those vertical corrections, I've seen them around 8 feet. So throwing all of that together, the estimate on water levels would depend on how deep the well is. The deeper the well is, the more problem you have with the trueness, and whether or not the well was surveyed or elevation was picked off the digital elevation model. Q. In terms of the accuracy of the water levels in the ESPA to calibrate the model, was that accuracy identified as a tenth of a foot, plus or minus a tenth of a foot? A. I don't think that the committee discussed that.	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\19\\20\\21\\22\\3\\24\\25\end{array} $	Page 45 any others? A. Presumably, since that very equation is used in McDonald and Harbaugh Modflow I'm sorry, Modflow, the it's been and Modflow and written in the '80s. 1989? MR. BROCKWAY: Around there. THE WITNESS: You know, that must have come from somebody's observations, so the technique Q. (BY MR. SIMPSON): It's pretty widely accepted? A. Correct. Q. Okay. If you were told that a correlation between a historical target spring flow and a USGS observation well had a linear R2 of .91, would that be a good correlation? A. Yes. Q. And that would be consistent with your previous statement that an R2 above .8 would be a good correlation; correct? A. Correct. Q. Do you believe it would be possible to estimate individual spring-flow impacts using the ESPAM-simulated ground water levels at specific USCS well location; correct

12 (Pages 42 to 45)

1equations between water levels in spring discharge1was to the spring as well? Isn't it true the2to estimate discharge impacts?2R-squared value is the primary indicator of3A. We've discussed my unease with certain3relationship between the well and the spring4aspects of that.4A. The R-squared tells you how we5Q. The two items that you identified?5of the apring	time of the
 2 to estimate discharge impacts? 3 A. We've discussed my unease with certain 4 aspects of that. 5 Q. The two items that you identified? 2 R-squared value is the primary indicator or relationship between the well and the spring 3 A. The R-squared tells you how we in this case, aquifer had explained the discontinuous of the apring 	of the
3 A. We've discussed my unease with certain 3 relationship between the well and the spr. 4 aspects of that. 3 A. The R-squared tells you how we 5 Q. The two items that you identified? 5 in this case, aquifer had explained the dis	ng flow?
4 aspects of that. 4 A. The R-squared tells you how we 5 Q. The two items that you identified? 5 in this case, aquifer had explained the dis 6 A. Correct 6 of the antigue of the	10 10 W = 1
5 Q. The two items that you identified? 6 A. Correct	1 the
6 A Compatibility of dominical 6 of the aprima	charge
7 O Right Okay Other than those two 7 O Okay And this morning we disc	ussed
8 items you believe it would be possible? 8 one of the reservations or concerns you w	ould have
9 A Certainly other than those two	s how
10 things it has an appeal yes	110'
11 0 And if those two items are reconciled 11 isn't that right?	us,
12 then would your appeal be even stronger? 12 Δ That's correct	
12 then would your appear of even stronger: 12 A. That's context. 13 A. Derbang. It may never even ide my 13 O. And if you had say a 24 year de	taset
14 appeal for this job though 14 appeal for this job though	uld you
15 MP SIMPSON: With that lat's take a lunch 15 consider that a pretty good dataset? Was	that on
16 broals	ulat all
10 break. 17 (Lunch record)	voll I
18 MP_SIMPSON: Pools on the recent 18 mass?	
10 IVIR. SIMIPSON. Dack on the record. 10 guess: 10 Allon I'm glad you had a good 10 O Irrespective of whether it's a pure	had
20 sondwich at lunch	iped
20 sandwich at funch. 21 Wen of a nonpulped wen, given that its	un and
21 In have you look at what is 21 observation wen, USOS observation wen	would
22 Appendix 2 to D1. Blockway's report that he med 22 that be a good dataset?	
2.5 In this matter. And it's the regression analysis. 2.5 A. The time span is good.	
24 And just, is that the regression 24 Q. Okay.	
Page 47	Page 49
1 Dr. Brockway's work? Does that look familiar? 1 very comfortable with that. And if it has	a good
2 A. Yes. 2 R-squared, then it's likely an unpumped w	ell.
3 Q. Okay. So that appears to be the 3 Q. Now, this morning you explained	l that
4 document that we've been referring to this 4 on at least one occasion you had an opport	tunity to
5 morning? 5 use the regression analysis on the evaluat	on you
6 A. That's correct. 6 did on certain wells to spring flows.	
7 Q. Okay. And then with respect to that 7 Do you recall that?	ļ
8 same appendix, Appendix 2 to Dr. Brockway's 8 A. That's correct.	
9 report, and this is figure 2. 9 Q. Okay. And do you recall genera	ly the
10 And can you see on there where it's 10 time frame that would have been? Would	that have
11 identified the well that Dr. Brockway reviewed in 11 been 2004? 2005? 2006?	
12 terms of his regression analysis and its [12] A. I went to work for the Department	nt in
13 relationship to the Snake River Farms springs? Do 13 2004. So it would be somewhere between	the late
14 you recall that figure? 14 '90s and 2004.	
15 A. I don't recall this figure, but it [15 Q. Okay. Okay. And, Allan, if you	
16 looks as if the well is very close to the spring. 16 personally felt there was a scientifically	
17 Q. Okay. So in terms of proximity and 17 justifiable procedure which might better e	stimate
18 the discussion we had this morning, the R2 the 18 the spring flows resulting from actions on	the
19 "R2"? R-squared value [19] aquifer, would you take that procedure or	that
20 MR. BROMLEY: D2. 20 analysis to the Department for consideration	on?
21 MR. BROCKWAY: R2D2. 21 A. I would I don't know.	
22 Q. (BY MR. SIMPSON): We'll stick with 22 Q. Well, that excuse me. Go aher	ıd.
23R-squared for a while.23A. In I try to not get involved in	
24 But the R-squared value would 24 what I consider administrative decisions.	And
25 definitely be an indicator of how close the well 25 there are administrative decisions that are	made

13 (Pages 46 to 49)

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	Page 50		Page 52
1	that I think could be made better, I guess. But	1	confidence. Probably look at more than one well.
2	they're administrative decisions, and if they want	2	O. But that
3	my input, they know where to find me.	3	A. As with intercontinental ballistic
4	And I think my job is to do answer	4	missiles, space flight, firearms, darts, the
5	the technical questions that they ask me, and they	5	smaller the target, the greater the uncertainty.
6	ask me plenty of technical questions. I have	6	So I would if it were really important I would
7	O You have plenty to do?	7	probably look at more than one thing
8	A L have plenty to do	8	Ω Do the R-squared values does that
9	0 Okay	9	raise the level of confidence?
10	A I don't	10	A Assuming the model were able to I
11	O Well with respect to the spring	11	was convinced the model were able to predict the
12	percentage is that one of those decisions that	12	head change in that area then I would be very
13	you feel could be made better?	13	comfortable given the R-squareds that I've seen
14	A I don't know You've obviously	14	O Okay And have you looked at all to
15	thought about it a lot more than I have I know	1.5	determine with respect to the model, the model's
16	it's a concern for the spring users	16	ability to determine changes in head in that area?
17	O Well would you agree that in any work	17	A No
18	done by the Department the Department endeavors	18	Ω Okay So as you sit here today you
19	to use the best science available?	19	haven't addressed that question?
20	A As with a lot of legal and policy	20	A No
21	things I think a lot of decisions get made	21	Ω Okay And do you have any reason to
22	because that's the way they've been made before	22	believe that the model doesn't reflect accurately
23	O So your answer to that is sometimes	23	the head changes in that area of the aquifer?
24	ves, sometimes no, with respect to using the best	24	A. It's certainly possible that it
25	science: is that correct?	25	doesn't. I I can't tell vou whether it does or
		1	
	Page 51		Page 53
1	Page 51	1	Page 53
1	Page 51 A. I try to use the best science I know	1	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's
1 2 3	Page 51 A. I try to use the best science I know how to do to answer the questions that I'm asked.	1 2 3	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing
1 2 3	Page 51 A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to rafine or continue to develop the relationship	1 2 3	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing.
1 2 3 4 5	Page 51 A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the acuifer levels and spring flows at	1 2 3 4 5	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing.
1 2 3 4 5 6	Page 51 A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the aquifer levels and spring flows at Snake River Farms, would you use the regression	1 2 3 4 5 6	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing. Q. Allan, are you generally familiar with the shortfalls being observed in a number of the
1 2 3 4 5 6 7	Page 51 A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the aquifer levels and spring flows at Snake River Farms, would you use the regression analysis based upon the information that you've	1 2 3 4 5 6 7	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing. Q. Allan, are you generally familiar with the shortfalls being observed in a number of the water rights spring water rights in the Thousand
1 2 3 4 5 6 7 8	Page 51 A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the aquifer levels and spring flows at Snake River Farms, would you use the regression analysis, based upon the information that you've reviewed in coming to this deposition today?	1 2 3 4 5 6 7 8	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing. Q. Allan, are you generally familiar with the shortfalls being observed in a number of the water rights, spring water rights in the Thousand Springs reach from purely a numbers standpoint
1 2 3 4 5 6 7 8 9	A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the aquifer levels and spring flows at Snake River Farms, would you use the regression analysis, based upon the information that you've reviewed in coming to this deposition today?	1 2 3 4 5 6 7 8 9	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing. Q. Allan, are you generally familiar with the shortfalls being observed in a number of the water rights, spring water rights in the Thousand Springs reach, from purely a numbers standpoint, the volume of water that's short?
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1 2 3 4 5 6 7 8 9 10 11	A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the aquifer levels and spring flows at Snake River Farms, would you use the regression analysis, based upon the information that you've reviewed in coming to this deposition today? A. The if the question was and my job was to correlate a stage in the aquifer and discharge at Clear Lakes I would use a regression	1 2 3 4 5 6 7 8 9 10	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing. Q. Allan, are you generally familiar with the shortfalls being observed in a number of the water rights, spring water rights in the Thousand Springs reach, from purely a numbers standpoint, the volume of water that's short? A. No. O. The discharge amounts that are short?
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1 2 3 4 5 6 7 8 9 10 11 12 13 14	A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the aquifer levels and spring flows at Snake River Farms, would you use the regression analysis, based upon the information that you've reviewed in coming to this deposition today? A. The if the question was and my job was to correlate a stage in the aquifer and discharge at Clear Lakes, I would use a regression analysis. Q. Well, if I were to come to you and say, "Allan, I want you to estimate the spring	1 2 3 4 5 6 7 8 9 10 11 12 13 14	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing. Q. Allan, are you generally familiar with the shortfalls being observed in a number of the water rights, spring water rights in the Thousand Springs reach, from purely a numbers standpoint, the volume of water that's short? A. No. Q. The discharge amounts that are short? A. No. I am aware that they're short and they're still going down. O. That the aquifer levels are still
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$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\19\\20\\21\end{array} $	 Page 51 A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the aquifer levels and spring flows at Snake River Farms, would you use the regression analysis, based upon the information that you've reviewed in coming to this deposition today? A. The if the question was and my job was to correlate a stage in the aquifer and discharge at Clear Lakes, I would use a regression analysis. Q. Well, if I were to come to you and say, "Allan, I want you to estimate the spring flows or the change in spring flows to Snake River Farms as a result of actions taken on the aquifer," would you utilize the regression analysis? A. I might. I would have to look at how well the model did at predicting heads at one of the wells, probably one of the wells Dr. Brockway 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\19\\20\\21\end{array} $	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing. Q. Allan, are you generally familiar with the shortfalls being observed in a number of the water rights, spring water rights in the Thousand Springs reach, from purely a numbers standpoint, the volume of water that's short? A. No. Q. The discharge amounts that are short? A. No. I am aware that they're short and they're still going down. Q. That the aquifer levels are still going down? A. Yes. Q. And the corresponding spring flows are still going down? A. (No audible response.) Q. So we still haven't reached equilibrium; would that be a true reflection?
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22	 Page 51 A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the aquifer levels and spring flows at Snake River Farms, would you use the regression analysis, based upon the information that you've reviewed in coming to this deposition today? A. The if the question was and my job was to correlate a stage in the aquifer and discharge at Clear Lakes, I would use a regression analysis. Q. Well, if I were to come to you and say, "Allan, I want you to estimate the spring flows or the change in spring flows to Snake River Farms as a result of actions taken on the aquifer," would you utilize the regression analysis? A. I might. I would have to look at how well the model did at predicting heads at one of the wells, probably one of the wells Dr. Brockway used. 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\19\\20\\21\\22\end{array} $	Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing. Q. Allan, are you generally familiar with the shortfalls being observed in a number of the water rights, spring water rights in the Thousand Springs reach, from purely a numbers standpoint, the volume of water that's short? A. No. Q. The discharge amounts that are short? A. No. I am aware that they're short and they're still going down. Q. That the aquifer levels are still going down? A. Yes. Q. And the corresponding spring flows are still going down? A. (No audible response.) Q. So we still haven't reached equilibrium; would that be a true reflection? A. I wouldn't in one sense we have to
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$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\9\\20\\21\\22\\23\\24\end{array} $	 Page 51 A. I try to use the best science I know how to do to answer the questions that I'm asked. Q. Okay. So if I were to ask you to refine or continue to develop the relationship between the aquifer levels and spring flows at Snake River Farms, would you use the regression analysis, based upon the information that you've reviewed in coming to this deposition today? A. The if the question was and my job was to correlate a stage in the aquifer and discharge at Clear Lakes, I would use a regression analysis. Q. Well, if I were to come to you and say, "Allan, I want you to estimate the spring flows or the change in spring flows to Snake River Farms as a result of actions taken on the aquifer," would you utilize the regression analysis? A. I might. I would have to look at how well the model did at predicting heads at one of the wells, probably one of the wells Dr. Brockway used. One thing I could do is recalibrate the model with the added weight on water levels in 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\9\\20\\22\\23\\24\end{array} $	 Page 53 not. But the model is better in some places than others. If you need it to do one thing, it's possible to make it really, really good at doing that one thing. Q. Allan, are you generally familiar with the shortfalls being observed in a number of the water rights, spring water rights in the Thousand Springs reach, from purely a numbers standpoint, the volume of water that's short? A. No. Q. The discharge amounts that are short? A. No. I am aware that they're short and they're still going down. Q. That the aquifer levels are still going down? A. Yes. Q. And the corresponding spring flows are still going down? A. (No audible response.) Q. So we still haven't reached equilibrium; would that be a true reflection? A. I wouldn't in one sense we have to be in equilibrium all the time. Q. Daily at the particular moment we're

14 (Pages 50 to 53)

	Page 54		Page 56
1	A. Correct.	1	I'm a little less clear recollecting what that
2	O. But given the fact that the spring	2	showed.
3	flows	3	But I don't think it showed that one
4	A. They haven't stabilized.	4	wet year was going to turn it around. There's a
5	Q. Right. Then the general trend in the	5	lot of water lost in storage when you get these
6	aquifer is still in decline; correct?	6	kinds of declines. So replenishing the aquifer is
7	A. Correct.	7	not a trivial thing. There's a lot of water lost
8	Q. And is that what the version 1.0	8	in storage.
9	version of the model would have predicted?	9	Q. Same could be said for pumping, isn't
10	A. Yes.	10	that true, that through pumping there's a lot of
11	Q. That we would still concede declines?	11	water lost to storage?
12	A. Yes, we did a drought scenario.	12	A. That's that's how one of the
13	Q. Uh-huh.	13	primary ways it gets lost, yes.
14	A. And in that drought scenario, it said	14	Q. Okay.
15	that if we continued to be in a drought that water	115	A. There's less recharge and more
10	levels would continue to decline.	110	pumping.
10	Q. Okay. Are we still in a drought?	10	Q. You've, have you not, reviewed the
	A. We had a good year.		lower hydrographs that snow continuing ground water
20	Q. Last year?	20	A L have yeah
20	A. ICS. O How about the year hefere?	21	A. Thave, yeah.
$\frac{21}{22}$	Q. How about the year before: Δ It was average	22	reasons for the these continued declines?
22	A. It was average. O Okay And the year before that?	23	A Primarily drought and there's changes
24	A Drought	24	in irrigation practices. The farmers have to get
25	O So we've had one dry year in the last	25	by with less water, so they have to change their
	Page 55		Page 57
-	Page 55	1	Page 57
1	Page 55 three; correct?	1	Page 57 irrigation practices.
1 2 3	Page 55 three; correct? A. Yes.	1 2 3	Page 57 irrigation practices. Q. And would that also mean increased pumping as well in changing irrigation practices?
1 2 3 4	Page 55 three; correct? A. Yes. Q. Okay. A. Seven dry years in the last ten or	1 2 3 4	Page 57 irrigation practices. Q. And would that also mean increased pumping as well in changing irrigation practices? A. It's a combination of increases in
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1 2 3 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 4 5 6 7 8 9 0 112 13 14 5 6 7 8 9 0 112 13 14 5 6 7 8 9 0 112 14 5 16 7 8 9 0 112 14 5 16 7 8 9 0 112 12 14 5 16 7 8 9 0 112 12 14 5 16 7 8 9 0 112 12 14 15 16 17 18 19 10 12 12 10 12 12 12 12 12 12 12 12 12 12 12 12 12	 Page 55 three; correct? A. Yes. Q. Okay. A. Seven dry years in the last ten or something like that. Q. Was that reflection of the last three years, was that in the drought scenario A. No. Q as the model described it? So in the drought scenario, as you've described, did this drought scenario identify year after year of drought? A. Yes. Q. Okay. So the drought scenario isn't reflective of what we've observed with respect to weather patterns over the last period of time; correct? At least over the last three years. A. The drought scenario, I believe, was three additional years of drought. The model finished in our calibration data set went to 2002. So that scenario said that with three additional years of drought, water levels would decline. And we did one with if we had a wet 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\2\\13\\14\\15\\16\\17\\18\\9\\20\\21\\22\\23\\24\end{array} $	Page 57 irrigation practices. Q. And would that also mean increased pumping as well in changing irrigation practices? A. It's a combination of increases in pumping and less incidental recharge. You got to fix the leaky canals if you're going to get water to the last guy on the ditch. And if you're flood irrigating and there's less water, you got to learn how to get by with less water, convert to sprinklers. All these things conspire to result in declines in the aquifer. Q. And you identified changes in surface water practices. And you would agree, wouldn't you not, that increasing in ground water pumping would also be a factor? A. Oh, yes. Q. Okay. Do you believe that aquifer levels are going to continue to decline? A. Well, there has to be an end to it. I mean Q. When there's no more water? Is that what you mean? A. Well, let's say for the foreceently
$1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 11 \\ 12 \\ 14 \\ 15 \\ 6 \\ 17 \\ 18 \\ 9 \\ 21 \\ 22 \\ 23 \\ 4 \\ 5 \\ 22 \\ 23 \\ 4 \\ 5 \\ 22 \\ 23 \\ 25 \\ 25 \\ 25 \\ 25 \\ 25 $	Page 55 three; correct? A. Yes. Q. Okay. A. Seven dry years in the last ten or something like that. Q. Was that reflection of the last three years, was that in the drought scenario A. No. Q as the model described it? So in the drought scenario, as you've described, did this drought scenario identify year after year of drought? A. Yes. Q. Okay. So the drought scenario isn't reflective of what we've observed with respect to weather patterns over the last period of time; correct? At least over the last three years. A. The drought scenario, I believe, was three additional years of drought. The model finished in our calibration data set went to 2002. So that scenario said that with three additional years of drought, water levels would decline. And we did one with if we had a wet year how would that impact it. And I don't	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\23\\14\\15\\16\\17\\18\\9\\20\\22\\23\\24\\25\end{array} $	Page 57 irrigation practices. Q. And would that also mean increased pumping as well in changing irrigation practices? A. It's a combination of increases in pumping and less incidental recharge. You got to fix the leaky canals if you're going to get water to the last guy on the ditch. And if you're flood irrigating and there's less water, you got to learn how to get by with less water, convert to sprinklers. All these things conspire to result in declines in the aquifer. Q. And you identified changes in surface water practices. And you would agree, wouldn't you not, that increasing in ground water pumping would also be a factor? A. Oh, yes. Q. Okay. Do you believe that aquifer levels are going to continue to decline? A. Well, there has to be an end to it. I mean Q. When there's no more water? Is that what you mean? A. Well, let's say for the foreseeable future yes

15 (Pages 54 to 57)

	Page 58		Page 60
1	O. And by "foreseeable," you mean 5, 10,	1	implementation of a trim line.
2	15 years?	2	Do you recall that testimony.
3	A. Five years, let's say.	3	generally?
4	O Okay. A minimum of five years?	4	A. I recall testimony on the trim line.
5	A I would expect them to continue	5	Ves
6	declining for something like five years	6	O And that it was a reflection of model
7	O Okay And have you expressed that	7	uncertainty?
8	opinion to your supervisors at the Department?	8	Δ That's the way the director defined
g	A I've said that it looks to me like we	g	it right
10	A. I've sald that it looks to he like we have to do compething or the aprings are going to	10	Ω And would you define it that way? Is
11	nave to do something of the springs are going to	11	the trim line a reflection of model uncertainty?
12	go any. Ω and what's been the regression to	12	A That's that's the way it's defined
12 12	Q. Okay. And what's been the response to	12	A. That's that's the way it's defined,
11	that?	11	So yes.
14	A. I guess an agreement that it looks	1 5	Q. Okay. Earlier you talked about
16	O LT has Kind of a life he is 19	10	recharge, you know, recharge errorts. And those
17	Q. Un-nun. Kind of a "So be it"?	17	recharge efforts, you identified the fail recharge
1/ 10	A. NO.		and those efforts.
10	MR. BROMLEY: Objection. Form.	10	Would those be artificial recharge
19	THE WITNESS: My supervisors aren't in a	19	efforts, that is, they're not naturally-occurring
20	policy-making position.	20	recharge, are they not?
	Q. (BY MR. SIMPSON): So in response to		A. That's correct.
22	you raising that issue or that discussion with you	22	Q. Okay. So also would seepage losses
23	and your supervisors, after that it goes up to a	23	through canals, that likewise would be artificial
24	policy decision? Is that what you're saying?	24	recharge, as opposed to natural recharge; correct?
25	A. Perhaps one response to this would be	25	A. Those are recharge due to man's
	Page 59		Page 61
1	a concerted effort to increase the recharge that	1	activity
~			activity.
2	happened this year and getting more recharge not	2	O Right
2 3	happened this year and getting more recharge, not only in the spring but in the fall. The water	2	Q. Right. A Is that what you mean by "artificial"?
2 3 4	happened this year and getting more recharge, not only in the spring, but in the fall. The water boards paying canal companies money to run water	2 3 4	Q. Right.A. Is that what you mean by "artificial"?Q. Would that be fair to say artificial
2 3 4 5	happened this year and getting more recharge, not only in the spring, but in the fall. The water boards paying canal companies money to run water on the shoulders of the season. And there was	2 3 4 5	 Q. Right. A. Is that what you mean by "artificial"? Q. Would that be fair to say, artificial would be the result of man-induced recharge as
2 3 4 5 6	happened this year and getting more recharge, not only in the spring, but in the fall. The water boards paying canal companies money to run water on the shoulders of the season. And there was Lknow there was an effort to try to get more of	2 3 4 5 6	 Q. Right. A. Is that what you mean by "artificial"? Q. Would that be fair to say, artificial would be the result of man-induced recharge as opposed to precipitation or tributary underflow or
2 3 4 5 6 7	happened this year and getting more recharge, not only in the spring, but in the fall. The water boards paying canal companies money to run water on the shoulders of the season. And there was I know there was an effort to try to get more of the a higher percentage of the late-season	2 3 4 5 6 7	 Q. Right. A. Is that what you mean by "artificial"? Q. Would that be fair to say, artificial would be the result of man-induced recharge as opposed to precipitation or tributary underflow or river losses or those activities which would be
2 3 4 5 6 7 8	happened this year and getting more recharge, not only in the spring, but in the fall. The water boards paying canal companies money to run water on the shoulders of the season. And there was I know there was an effort to try to get more of the a higher percentage of the late-season recharge in the lower part of the aquifer	2 3 4 5 6 7 8	 Q. Right. A. Is that what you mean by "artificial"? Q. Would that be fair to say, artificial would be the result of man-induced recharge as opposed to precipitation or tributary underflow or river losses or those activities which would be natural recharge?
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2 3 4 5 6 7 8 9 10 11 12 13	happened this year and getting more recharge, not only in the spring, but in the fall. The water boards paying canal companies money to run water on the shoulders of the season. And there was I know there was an effort to try to get more of the a higher percentage of the late-season recharge in the lower part of the aquifer. So I don't know certainly a "so be it" attitude is not not what I would expect. I expect that people are taking notice and trying to do things.	2 3 4 5 6 7 8 9 10 11 12 13	 Q. Right. A. Is that what you mean by "artificial"? Q. Would that be fair to say, artificial would be the result of man-induced recharge as opposed to precipitation or tributary underflow or river losses or those activities which would be natural recharge? A. Recharge if we're going to call recharge due to man's activities artificial, then it would be artificial recharge. Q. Okay. Well, would you agree that artificial recharge would be recharge induced by
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16 (Pages 58 to 61)

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1	during the irrigation season would be due to canal	1	has uncertainty
2	losses during the irrigation season would be	2	O But wouldn't it be fair to say that
3	artificial and Lagree	3	you identify a calculated method for taking into
Δ	Ω	4	account model uncertainty which was and still
5	model uncertainty and the calculation of the trim	5	today is unknown?
6	line in relationship to the river gauges	6	Δ And will be There are ways to get a
7	A Vec	7	reasonable get a more defensible estimate for
ģ	Λ . 105.	l g	uncertainty but it will never be
a	Vour view, similar to what you described the	a	O You'll never know exactly the degree
10	spring percentage as not being a rigorous	110	of uncertainty?
11	spring percentage as not being a rigorous	111	A Vou'll never know exectly what the
1^{\perp}	A The my analysis that I provided to	12	A. Toull level know exactly what the
12	A. The my analysis that I provided to Director Drobor on uncortainty for version 1 of	13	O Pight
11	the model was not rigorous	11	Q. Night.
15	O Olizy So literation than because it	115	A until you don't need the model.
16	Q. Okay. So likewise, then, because it	116	Q. Would you agree that the EEDA on a nexticular
17	A The willing to defend it as a	17	pullipling from each well in the ESFA of a particular
10	A. I'm willing to defend it as a	10	reach has the same level of uncertainty under your
10	placeholder.	10	MS Mallicity in acting to altigate again on
20	Q. Okay.	20	MS. MCHOOH. The going to object again on
20	A. As soon as in this instance, as	20	relevance for this hearing, this line of
∠⊥ 22	soon as the committee's ever able to provide a	21	questioning on model uncertainty and all of that.
22	O Oliver And he learning that one.	22	MR. SIMPSON: Well, I guess at this point
23	Q. Okay. And by "committee," you mean	23	The just say that the hearing officer opened up
24	A Vec	24	here to day. So
2.5	A. Its.	125	nere iouay. So
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1	Page 63 Q. Okay. And have you been at ESPAM	1	Page 65 MS. McHUGH: I just want to make sure that
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$\begin{array}{c}1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\5\\16\\17\\18\\9\\20\\22\\23\\4\\22\\23\\4\\22\\23\\4\\22\\23\\4\\22\\23\\24\\22\\23\\24\\22\\23\\24\\22\\23\\24\\22\\23\\24\\24\\22\\23\\24\\24\\22\\23\\24\\24\\24\\24\\24\\24\\24\\24\\24\\24\\24\\24\\24\\$	Page 63 Q. Okay. And have you been at ESPAM committee meetings where Sean Vincent and other Department employees have recognized that there's no relationship between model uncertainty and the river gauges? A. No, I have not. Q. You haven't been to those meetings? A. I've heard Mr. Koreny claim that, but I've not really Q. You haven't heard Sean say that directly? A. No. Q. Okay. Isn't it true that the trim line as used in the order is not scientifically based, but based upon the fact that, scientifically speaking, the model isn't 100 percent accurate? A. Well, it's true that the model is not 100 percent accurate. Q. Then is the calculation of the trim line scientifically based or is it just a calculated representation of uncertainty at the river gauges? A. Director Dreher tied the trim line to	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\19\\20\\21\\22\\23\\24\end{array} $	 Page 65 MS. McHUGH: I just want to make sure that my objection with regards to relevancy to the December 7th hearing is on the record. MR. SIMPSON: Okay. Q. Did that give you some time to think about it, or do you want to offer an opinion on that issue too? A. Could you restate your question? I can't understand it the way you state it. Q. Okay. Would you agree that the effect of pumping from each well in the ESPA on a particular reach has the same level of uncertainty under your calculated method? A. So are you asking that this simplistic uncertainty analysis is not spatially or temporally varying, and that a more rigorous analysis would be spatially and temporally varying uncertainty? Q. Well, with respect to your present analysis, the 10 percent, isn't it true that each well and the effect of each well and the pumping at that well is either plus or minus at the river gauges because of the lack of complete certainty as to the reading at the particular river gauge?

17 (Pages 62 to 65)

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	Page 66		Page 68
1	you're trying to drive at, and I'll try to answer	1	away, it will likewise under the present analysis
2	both One is that if the river reach is expanded	2	have a plus or minus 10 percent?
3	if the reaches are combined so they're all one	3	A. That's correct.
4	reach then the impact of a well on the river is	4	O. Okay. So that plus or minus
5	going to be 100 percent All depletions are	5	10 percent, as you've described it is really
6	eventually realized in the river Okay? That's	6	applicable throughout the whole Eastern Snake
7	one possibility	7	Plain: correct?
8	O Okay	8	A Correct
9	A = - that your question might be going	9	O Okay
10	at	10	A It's not spatially or temporally
111	And two if and when we do a rigorous	11	varving
12	uncertainty analysis it should show that	12	O Right Would you agree that each well
13	uncertainty is both spatially and temporally	13	pumping on the ESPA has had some or will have some
14	varving	14	depletive effect on the reaches of the Snake
15	So if we look at reach A some	15	River, including the Buhl to Thousand Springs
16	portions of the aquifer will the impact on that	16	reach?
17	reach will be more certain than others And if we	17	A. Each well pumping on the ESPA has an
18	look in time, over time that uncertainty will vary	18	impact. 100 percent of its impact's realized
19	how those impacts are realized at the reach.	19	on
20	O. Okay. You're identifying the fact if	20	O. One of the reaches?
21	your placeholder is replaced with a rigorous	21	\overrightarrow{A} one or all of the reaches.
22	analysis of uncertainty	22	Q. Okay.
23	A. Uh-huh.	23	A. They there are responses carried
24	O it will look at the spatial and	24	out to five decimal places. There are cells that
25	temporal effects; right?	25	have zero impact on some reaches. So not every
		1	
	Page 67		Page 69
1	Page 67	1	Page 69 reach is impacted by every cell. Most cells do
1	Page 67 A. Right. O With respect to the 10 percent model	1	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places
1 2 3	Page 67 A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your	1 2 3	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places.
1 2 3 4	Page 67 A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges'	1 2 3 4	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places. Q. Every reach? A. Every reach. Not all
1 2 3 4 5	A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges' ability to measure changes	1 2 3 4 5	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places. Q. Every reach? A. Every reach. Not all. Q. And so within any particular cell the
1 2 3 4 5 6	A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges' ability to measure changes A. Uh-huh	1 2 3 4 5 6	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places. Q. Every reach? A. Every reach. Not all. Q. And so within any particular cell, the number of wells in there, when added together
1 2 3 4 5 6 7	 Page 67 A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges' ability to measure changes A. Uh-huh. Q is that temporally and spatially 	1 2 3 4 5 6 7	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places. Q. Every reach? A. Every reach. Not all. Q. And so within any particular cell, the number of wells in there, when added together, would likewise have a depletive effect on some or
1 2 3 4 5 6 7 8	A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges' ability to measure changes A. Uh-huh. Q is that temporally and spatially accurate?	1 2 3 4 5 6 7 8	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places. Q. Every reach? A. Every reach. Not all. Q. And so within any particular cell, the number of wells in there, when added together, would likewise have a depletive effect on some or all of the reaches?
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$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\1\\1\\2\\1\\1\\1\\5\\1\\6\\1\\7\\1\\8\\9\\0\end{array} $	 A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges' ability to measure changes A. Uh-huh. Q is that temporally and spatially accurate? A. No, it's simplistic. Q. Simplistic? A. It's a simplistic, nonrigorous. I think we've identified that. Q. We've agreed on that point. Sure. So in that respect if you have a well that's, say, 2 miles away from a spring reach and you're looking at the effect of that pumping on a river reach, the certainty of the effect of that well on the river reach will have a plus or minus 10 percent attached to it; correct? 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\0\\11\\12\\13\\14\\15\\16\\17\\18\\9\\2\end{array} $	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places. Q. Every reach? A. Every reach. Not all. Q. And so within any particular cell, the number of wells in there, when added together, would likewise have a depletive effect on some or all of the reaches? A. That's correct. Q. Based upon what you've just described, with respect to each well pumping in the ESPA, wouldn't it be a more accurate reflection of uncertainty if each well in the ESPA were assigned the same level of uncertainty as opposed to assigning uncertainty based solely upon the distance from a particular reach? A. They are assigned a constant uncertainty at the current time. Q. Okay. So isn't that a reflection of the uncertainty of the river gauges?
$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\2\\13\\14\\15\\16\\17\\18\\9\\20\\1\end{array} $	 A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges' ability to measure changes A. Uh-huh. Q is that temporally and spatially accurate? A. No, it's simplistic. Q. Simplistic? A. It's a simplistic, nonrigorous. I think we've identified that. Q. We've agreed on that point. Sure. So in that respect if you have a well that's, say, 2 miles away from a spring reach and you're looking at the effect of that pumping on a river reach, the certainty of the effect of that well on the river reach will have a plus or minus 10 percent attached to it; correct? A. And if you're looking at a well that's 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\23\\14\\15\\16\\17\\18\\9\\20\\21\\\end{array} $	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places. Q. Every reach? A. Every reach. Not all. Q. And so within any particular cell, the number of wells in there, when added together, would likewise have a depletive effect on some or all of the reaches? A. That's correct. Q. Based upon what you've just described, with respect to each well pumping in the ESPA, wouldn't it be a more accurate reflection of uncertainty if each well in the ESPA were assigned the same level of uncertainty as opposed to assigning uncertainty based solely upon the distance from a particular reach? A. They are assigned a constant uncertainty at the current time. Q. Okay. So isn't that a reflection of the uncertainty of the river gauges? A. That is a reflection of the
$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\23\\14\\15\\16\\17\\18\\9\\20\\22\\22\\22\\22\\22\\22\\22\\22\\22\\22\\22\\22\\$	 A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges' ability to measure changes A. Uh-huh. Q is that temporally and spatially accurate? A. No, it's simplistic. Q. Simplistic? A. It's a simplistic, nonrigorous. I think we've identified that. Q. We've agreed on that point. Sure. So in that respect if you have a well that's, say, 2 miles away from a spring reach and you're looking at the effect of that pumping on a river reach, the certainty of the effect of that well on the river reach will have a plus or minus 10 percent attached to it; correct? A. Correct. Q. And if you're looking at a well that's 5 miles away from the river reach, it will have 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\23\\14\\15\\16\\7\\8\\9\\0\\21\\22\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2$	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places. Q. Every reach? A. Every reach. Not all. Q. And so within any particular cell, the number of wells in there, when added together, would likewise have a depletive effect on some or all of the reaches? A. That's correct. Q. Based upon what you've just described, with respect to each well pumping in the ESPA, wouldn't it be a more accurate reflection of uncertainty if each well in the ESPA were assigned the same level of uncertainty as opposed to assigning uncertainty based solely upon the distance from a particular reach? A. They are assigned a constant uncertainty at the current time. Q. Okay. So isn't that a reflection of the uncertainty of the river gauges? A. That is a reflection of the uncertainty of the river gauges, correct.
$\begin{array}{c}1\\2\\3\\4\\5\\6\\7\\8\\9\\0\\11\\12\\14\\15\\16\\17\\8\\9\\21\\22\\3\\\end{array}$	 Page 67 A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges' ability to measure changes A. Uh-huh. Q is that temporally and spatially accurate? A. No, it's simplistic. Q. Simplistic? A. It's a simplistic, nonrigorous. I think we've identified that. Q. We've agreed on that point. Sure. So in that respect if you have a well that's, say, 2 miles away from a spring reach and you're looking at the effect of that pumping on a river reach, the certainty of the effect of that well on the river reach will have a plus or minus 10 percent attached to it; correct? A. Correct. Q. And if you're looking at a well that's 5 miles away from the river reach, it will have the same plus or minus 10 percent; correct? 	1 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 4 5 6 7 8 9 0 11 2 3 1 1 2 3 4 5 1 1 2 3 1 1 2 3 1 1 1 2 3 1 1 1 2 3 1 1 1 2 3 1 1 1 1	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places. Q. Every reach? A. Every reach. Not all. Q. And so within any particular cell, the number of wells in there, when added together, would likewise have a depletive effect on some or all of the reaches? A. That's correct. Q. Based upon what you've just described, with respect to each well pumping in the ESPA, wouldn't it be a more accurate reflection of uncertainty if each well in the ESPA were assigned the same level of uncertainty as opposed to assigning uncertainty based solely upon the distance from a particular reach? A. They are assigned a constant uncertainty at the current time. Q. Okay. So isn't that a reflection of the uncertainty of the river gauges? A. That is a reflection of the uncertainty of the river gauges, correct. Q. Right. So then with respect to the
$1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 16 \\ 17 \\ 18 \\ 9 \\ 21 \\ 22 \\ 23 \\ 4 \\ 5 \\ 10 \\ 12 \\ 22 \\ 23 \\ 4 \\ 5 \\ 10 \\ 12 \\ 22 \\ 23 \\ 4 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 \\ 10 $	 Page 67 A. Right. Q. With respect to the 10 percent model uncertainty that you've identified through your reference to the river gauge and the river gauges' ability to measure changes A. Uh-huh. Q is that temporally and spatially accurate? A. No, it's simplistic. Q. Simplistic? A. It's a simplistic, nonrigorous. I think we've identified that. Q. We've agreed on that point. Sure. So in that respect if you have a well that's, say, 2 miles away from a spring reach and you're looking at the effect of that pumping on a river reach, the certainty of the effect of that well on the river reach will have a plus or minus 10 percent attached to it; correct? A. Correct. Q. And if you're looking at a well that's 5 miles away from the river reach, it will have the same plus or minus 10 percent; correct? A. That's correct. 	$1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 1 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2$	Page 69 reach is impacted by every cell. Most cells do impact within five decimal places. Q. Every reach? A. Every reach. Not all. Q. And so within any particular cell, the number of wells in there, when added together, would likewise have a depletive effect on some or all of the reaches? A. That's correct. Q. Based upon what you've just described, with respect to each well pumping in the ESPA, wouldn't it be a more accurate reflection of uncertainty if each well in the ESPA were assigned the same level of uncertainty as opposed to assigning uncertainty based solely upon the distance from a particular reach? A. They are assigned a constant uncertainty at the current time. Q. Okay. So isn't that a reflection of the uncertainty of the river gauges? A. That is a reflection of the uncertainty of the river gauges, correct. Q. Right. So then with respect to the trim line, is that an additional uncertainty

18 (Pages 66 to 69)

2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 14 5 16 17 18 9 20 21 22 3 24 25	 A. No. Q. Do you understand my question? A. The way I see it is that I told Director Dreher that if he was going to deploy the model, he had to acknowledge uncertainty somehow. Q. So did you make that policy decision? A. I told the director that it was important to acknowledge uncertainty Q. Okay. A if he was going to deploy the model. And Director Dreher chose to do it with the trim line. Q. Okay. I have a follow-up to a question I asked you. Have you been at any ESPAM technical committee meetings where Mr. Vincent identified that the trim line is not based upon model uncertainty? A. No, I don't recall that at all. Q. Okay. Mr. Wylie, did IWRRI or IDWR perform a sensitivity analysis of the model to determine uncertainty? A. As a result of a calibration run with the software we use, there's a sensitivity 	2 3 4 5 6 7 8 9 0 11 12 13 4 5 6 7 8 9 0 11 12 13 4 5 6 7 8 9 0 11 12 13 4 5 6 7 8 9 0 11 12 13 4 5 6 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2 2	 different if the model were calibrated to those wells in those cells, that uncertainty is much less, say 2 percent, as you described previously? A. So if instead of predicting reach gains Q. Right. A we were predicting water level in the aquifer, what would the uncertainty be? Q. Wouldn't that uncertainty be the accuracy of the water levels in those observation wells or that well data? A. I don't know. It's certain that the water levels would play a key role since that's the metric that we're trying to predict. When we are trying to predict reach gains, the uncertainty in the gauges plays a more key role. Q. Well, you wouldn't try to assert that the accuracy in measuring water-level changes in those wells was plus or minus 10 percent, would you? A. I haven't. Q. But would you agree that that would be
	Page 71		Page 73
1	analysis printed out. And I don't believe that	1	uncertainty attached to the river gauge as you
2	that played much of a role in my when I came up	2	would to a water-level change?
3	with the 10 percent.	3	A. So if we're in a situation where water
4	I did some other analyses, and they	4	levels are the key and we need to get uncertainty
5	consisted mostly of where I would ask try to	5	for water levels, I would do and I believe you
6	recalibrate the model and see how much I could	6	pressed me on this in the A & B hearing, and I
7	change what model cells were contributing mostly	7	I would do different analyses than I have, and I'm
8	to the reach to try to change the response	8	sure I would come up with different conclusions.
9	functions, ask the model to change the response	9	And I would bring these conclusions to
10	functions.	10	the director, whoever that would be, and because
	And the result of that, that there was		presumably I would have implored the director "We
12	an average kind of an average of right around	12	need to address uncertainty in this matter if the
13	10 percent. Of course, it was spatially variable,	113	model's going to be used this way." And then some
14	and I was just looking at steady-state response		kind of a decision would be made by the director.
15	functions, not transient.	15	Q. Well, if in fact
10	But the fact that I could only change	10	A. But it would, in fact, no doubt
	them well, my recollection is some of them were		reflect more of the uncertainty in water levels
	changing around 20 percent, but they weren't in		than the uncertainty in river gains.
20	areas that there was much irrigation. But most of	20	Q. In fact, didn't Gary Jonnson look at
21	ine cents that were where there was much	21	if you recharged in certain counties what the
22	O Okoy If you were using the model to	22	A Ves
22	Q. Okay. If you were using the model to	22	$ \begin{array}{ccc} \Lambda, & 1 \ \nabla \delta, \\ \Omega, & V = 0 \end{array} $
24	cells on the ESPA as a result of actions taken on	24	yater model from a countravide perspective actions
25	the ESPA as opposed to looking at changes in the	25	taken in one county - i.e. recharge and what
<u> </u>	The Los A as opposed to tooking at changes in the	120	and in one county i.e., icenarge and what

19 (Pages 70 to 73)

	Page 74		Page 76
1	the effect would be in other areas of the aquifer	1	answer? Sure. You can look at it, because it's
$\frac{1}{2}$	in other counties: correct?	2	got the answer at the bottom.
3	A Correct	3	MR. BROCKWAY: Does that become an exhibit?
4	Ω And just looking at that analysis the	4	O (BY MR SIMPSON): The last one
5	uncertainty of those results that were described	5	Δ Veah
6	through the modeling of those actions, would it be	6	MS McHIIGH: And just for the record
	reasonable to conclude that these were at a level	7	Dr. Wylie is looking at a handwritten note from
	of cortainty plus or minus 2 percent because	8	Dr. Brochway to Mr. Simpson
a	that's the uncertainty of the ground water level	a	THE WITNESS: Okay So as best L can
10	manufacture and the ground water level	10	figure the question is if you run a simulation
11	A If I were going to dealars on	11	any a baseline detects and then you run a
1^{\perp}	A. If I were going to declare an	12	say a baseline dataset, and men you run a
1 2	uncertainty for water levels, the model's ability	12	simulation with some kind of a freament that
	to predict water levels, I would do some model	11	would result in a change in, in this case, pumping
	runs, I would try to ask the model to change	15	stress on the aquifer, and you difference those
10	things, and see now well it could still match	15	two simulations, then the question is is there
10	water levels in river gains. And how it had to	17	less uncertainty in that difference than there is
	change water how it had to what adjustments		in the prediction? Is that the question,
18	it had to make in order to do that.	10	Mr. Simpson?
19	And there's in the analysis, it	119	Q. (BY MR. SIMPSON): Well, that may have
20	gives a standard deviation and a mean for how well	20	been the question, but I have moved on from that
21	it matches all the water levels. And you can look	21	for obvious reasons, some of which being the
22	at that. And you can ask it to recalibrate and	22	author of it.
23	see how well it continues to match those	23	A. Models are generally better at
24	statistics.	24	predicting differences than
25	And from that I could come up with	25	MR. SIMPSON: Okay. I'm going to mark what
	Page 75		Page 77
1	that's one possible way, just one possible way I	1	will be the next exhibit, 40.
2	could do that. I haven't done any of that yet.	2	We can go off the record for a few
3	O. Okay. Dr. Wylie, is all of Water	3	minutes.
4	District 130 included within the trim line area	4	(Recess.)
5	for Clear Springs?	5	(Exhibit 40 marked.)
6	A. I don't believe so.	6	MR. SIMPSON: Back on the record.
7	O. Okay. Why not?	7	O. Allan, you've been handed
8	A Because some of it falls out of the	8	Exhibit No. 40.
9	some of it is less than 10 percent response on the	9	Do you recognize that document?
10	Devil's Washbowl to Buhl reach.	10	A. Yes.
11	O Would the model simulations of	11	O Okay. And have you seen that document
12	differences in reach gains due to changes in	12	in committee meetings for ESPAM?
13	pumping be less than the simulation of absolute	13	A Yes
14	values?	14	O Okay And prior to today and prior to
15	A Can you try that one again?	15	this week have you reviewed that document?
16	O Would the model simulations of	16	Δ Ves
17	differences in reach gains due to changes in	17	Ω And is it true that at least a part of
18	numping be less than the simulation of absolute	18	that document is what you've discussed earlier
	values? I et's try this one more time	19	today the basis for some of the answers and some
	Would the uncertainty in the model	20	of the questions that were posed to you earlier
21	simulations of differences in reach going due to	21	today?
22	changes in pumping he less than the simulation of	22	A This document been't abanced my mind
22	absolute values?	23	on anything
20	A Cap Llook at that?	20	O Okay Wall lat's just so through it
25	Ω . Volument to look at that for the	25	On the second page of this document, it has a
20	2. 100 want to 100K at that 101 the	20	on the second page of this document, it has a
			20 (Pages 74 to 77)

	Page 78		Page 80
1	reference to the director's letter. And I think	1	A. That's what it says, yeah.
2	that that's included in the packet back there. If	2	O. So would it be fair to say that where
3	you thumb through it, you would have found it.	3	the "no effect" standard was used, that would be
4	A. Yeah, I found it.	4	identified by the ground water model and the
5	O. And does that letter identify that the	5	running of the ground water model?
6	purpose of the trim line or the clip was to avoid	6	A. Well, to five or six significant
7	curtailing ground water users who may have no	7	digits, sure.
8	effect on enhancing reach gains?	8	O. Right. But that's what the model
9	A. Would that be in the quotes from the	9	would show is if that were the standard to five or
10	hearing officer?	10	six significant digits, those cells would have no
11	O. Well, if you look on page 2 of the	11	effect on certain reaches of the river: correct?
12	document. All right. And if you look up towards	12	A. Correct.
13	the top there, do you see the first full	13	O. And otherwise, every cell would have
14	paragraph or excuse me, it looks like it is the	14	an effect on reaches of the Snake River: correct?
15	second paragraph that starts with "The Director's	15	A. If the reaches are big enough, every
16	letter explains that"?	16	cell has an impact, correct.
17	A. Yes.	17	O. Okay. And in the Buhl to Thousand
18	O. And do you see the sentence in italics	18	Springs reach, is that a big enough cell, as you
19	there in quotes?	19	described or big enough reach? Excuse me.
20	A. Yes.	20	A. It's one of the smaller reaches.
21	O. And do you recall that that was the	21	O. Okav. And so what you're saying is
22	purpose of the trim line or the clip, as it's	22	that there would be cells in the ESPA model for
23	called there? And if you want to look on the	23	which going out five or six digits would not show
24	letter, it's on the second page of the letter on	24	an effect?
25	the top of the page.	25	A. It's I would expect, yes, that
	Page 79		Page 81
-	Page 79	-	Page 81
1	Page 79 A. The second page?	1	Page 81 there would be cells in the model that would have
1 2	Page 79 A. The second page? Q. Right.	1 2	Page 81 there would be cells in the model that would have no effect but six significant digits.
1 2 3	Page 79 A. The second page? Q. Right. A. Okay.	1 2 3	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would
1 2 3 4	Page 79 A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that	1 2 3 4	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to
1 2 3 4 5	Page 79 A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not?	1 2 3 4 5	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach?
1 2 3 4 5 6	Page 79 A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes.	1 2 3 4 5 6 7	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect.
1 2 3 4 5 6 7	Page 79 A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of	1 2 3 4 5 6 7	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim
1 2 3 4 5 6 7 8	A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter	1 2 3 4 5 6 7 8	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you
1 2 3 4 5 6 7 8 9	A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter A. From Director Tuthill?	1 2 3 4 5 6 7 8 9	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects
1 2 3 4 5 6 7 8 9 10	A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter A. From Director Tuthill? Q from Director Tuthill at that time	1 2 3 4 5 6 7 8 9 10	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects of ground water depletions from wells outside of
1 2 3 4 5 6 7 8 9 10 11	A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter A. From Director Tuthill? Q from Director Tuthill at that time to members of the committee; correct?	1 2 3 4 5 6 7 8 9 10 11	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects of ground water depletions from wells outside of the trim line on the ESPA that those effects would
1 2 3 4 5 6 7 8 9 10 11 12	A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter A. From Director Tuthill? Q from Director Tuthill at that time to members of the committee; correct? A. Correct. Q. All is let and examples directed	1 2 3 4 5 6 7 8 9 10 11 12	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects of ground water depletions from wells outside of the trim line on the ESPA that those effects would not be de minimis?
1 2 3 4 5 6 7 8 9 10 11 12 13	 Page 79 A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter A. From Director Tuthill? Q from Director Tuthill at that time to members of the committee; correct? A. Correct. Q. All right. And as we've discussed 	1 2 3 4 5 6 7 8 9 10 11 12 13	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects of ground water depletions from wells outside of the trim line on the ESPA that those effects would not be de minimis? A. We would have to define "de minimis."
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$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\1\end{array} $	 Page 79 A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter A. From Director Tuthill? Q from Director Tuthill at that time to members of the committee; correct? A. Correct. Q. All right. And as we've discussed this morning, you identified that there were a few cells in the ESPA in which those cells and pumping in those cells would have no effect on some reaches of the Snake River; correct? 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\end{array} $	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects of ground water depletions from wells outside of the trim line on the ESPA that those effects would not be de minimis? A. We would have to define "de minimis." Q. Well, why don't you give me your definition, and I'll ask the question again. A. Okay. I could define it as, for instance, if it has less if a cell has less
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$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\9\\20\\21\\22\end{array} $	 Page 79 A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter A. From Director Tuthill? Q from Director Tuthill at that time to members of the committee; correct? A. Correct. Q. All right. And as we've discussed this morning, you identified that there were a few cells in the ESPA in which those cells and pumping in those cells would have no effect on some reaches of the Snake River; correct? A. Well, to six significant digits, no effect, yes. Q. Right. And no means no, right, in terms of this statement in Mr. Tuthill's letter identifies that the sum are a fifth this line to means a fifth to the second page of the second page of the statement in Mr. Tuthill's letter identifies that the sum are a fifth to be cells and pumping in the statement in Mr. Tuthill's letter identifies that the sum are a fifth to be cells and pumping in the statement in Mr. Tuthill's letter identifies that the sum are a fifth to be cells and pumping in the statement in Mr. Tuthill's letter identifies that the sum are a fifth to be cells and pumping in the statement in Mr. Tuthill's letter identifies that the sum are a fifth to be cells and pumping in the statement in Mr. Tuthill's letter identifies that the sum are a fifth to be cells and pumping in the statement in Mr. Tuthill's letter identifies that the sum are a fifth to be cells and pumping in the statement in Mr. Tuthill's letter 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\2\\13\\14\\15\\16\\17\\18\\9\\21\\22\\21\\22\end{array} $	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects of ground water depletions from wells outside of the trim line on the ESPA that those effects would not be de minimis? A. We would have to define "de minimis." Q. Well, why don't you give me your definition, and I'll ask the question again. A. Okay. I could define it as, for instance, if it has less if a cell has less than 10 percent of an impact on a reach, then it's de minimis. And then we would Q. Okay. Let's add up all the cells outside of the trim line
$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\9\\20\\21\\22\\22\\22\end{array} $	 Page 79 A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter A. From Director Tuthill? Q from Director Tuthill at that time to members of the committee; correct? A. Correct. Q. All right. And as we've discussed this morning, you identified that there were a few cells in the ESPA in which those cells and pumping in those cells would have no effect on some reaches of the Snake River; correct? A. Well, to six significant digits, no effect, yes. Q. Right. And no means no, right, in terms of this statement in Mr. Tuthill's letter identifies that the purpose of the trim line or the alia were in a main the means of the trim line or the alia were in the trim line or the alia were interval. 	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\9\\20\\22\\22\\22\end{array} $	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects of ground water depletions from wells outside of the trim line on the ESPA that those effects would not be de minimis? A. We would have to define "de minimis." Q. Well, why don't you give me your definition, and I'll ask the question again. A. Okay. I could define it as, for instance, if it has less if a cell has less than 10 percent of an impact on a reach, then it's de minimis. And then we would Q. Okay. Let's add up all the cells outside of the trim line A. Uh-huh.
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 20 21 22 23	 Page 79 A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter A. From Director Tuthill? Q from Director Tuthill at that time to members of the committee; correct? A. Correct. Q. All right. And as we've discussed this morning, you identified that there were a few cells in the ESPA in which those cells and pumping in those cells would have no effect on some reaches of the Snake River; correct? A. Well, to six significant digits, no effect, yes. Q. Right. And no means no, right, in terms of this statement in Mr. Tuthill's letter identifies that the purpose of the trim line or the clip was to avoid curtailing ground water 	1 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 3 4 5 6 7 8 9 10 11 2 12 1 1 1 2 1 1 1 1 1 1 1 1 1 1	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects of ground water depletions from wells outside of the trim line on the ESPA that those effects would not be de minimis? A. We would have to define "de minimis." Q. Well, why don't you give me your definition, and I'll ask the question again. A. Okay. I could define it as, for instance, if it has less if a cell has less than 10 percent of an impact on a reach, then it's de minimis. And then we would Q. Okay. Let's add up all the cells outside of the trim line A. Uh-huh. Q and their depletive effect from
$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\12\\13\\14\\15\\16\\17\\18\\9\\20\\21\\22\\3\\24\\25\end{array} $	 Page 79 A. The second page? Q. Right. A. Okay. Q. And you see the reference now to that sentence, do you not? A. Yes. Q. Okay. And it's on the second page of the letter A. From Director Tuthill? Q from Director Tuthill at that time to members of the committee; correct? A. Correct. Q. All right. And as we've discussed this morning, you identified that there were a few cells in the ESPA in which those cells and pumping in those cells would have no effect on some reaches of the Snake River; correct? A. Well, to six significant digits, no effect, yes. Q. Right. And no means no, right, in terms of this statement in Mr. Tuthill's letter identifies that the purpose of the trim line or the clip was to avoid curtailing ground water users who might have no effect? Is that what it 	$1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 10 \\ 11 \\ 12 \\ 13 \\ 14 \\ 15 \\ 6 \\ 17 \\ 18 \\ 9 \\ 20 \\ 22 \\ 23 \\ 4 \\ 5 \\ 21 \\ 22 \\ 24 \\ 5 \\ 22 \\ 24 \\ 5 \\ 24 \\ 5 \\ 24 \\ 25 \\ 25$	Page 81 there would be cells in the model that would have no effect but six significant digits. Q. Okay. Otherwise, those cells would show an effect if you ran the model on the Buhl to Thousand Springs reach? A. They would show an effect. Q. Okay. And with respect to the trim line and the placement of the trim line, would you agree that if you added up the depletive effects of ground water depletions from wells outside of the trim line on the ESPA that those effects would not be de minimis? A. We would have to define "de minimis." Q. Well, why don't you give me your definition, and I'll ask the question again. A. Okay. I could define it as, for instance, if it has less if a cell has less than 10 percent of an impact on a reach, then it's de minimis. And then we would Q. Okay. Let's add up all the cells outside of the trim line A. Uh-huh. Q and their depletive effect from pumping within those cells on the Buhl to Thousand

21 (Pages 78 to 81)

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	Page 82		Page 84
1	de minimis?	1	60,000 you'd still call de minimis?
2	A. More than 90 percent of their impact	2	A. It depends on how you define
3	would, by definition, be on other reaches, so, by	3	"de minimis."
4	my definition, it would be de minimis.	4	O. Allan, if there were no model
5	O Okay. But is that 10 percent in terms	5	uncertainty attached to the use of the model, who
6	of the volume pumped is that de minimis on the	6	would bear the risk of the model not being
7	reach? Is it a measurable amount?	7	100 percent accurate?
8	A It depends on how you define	8	MR BROMIEV: Calls for a legal conclusion
a	"de minimie "	a	MS McHIIGH: And I'll object to foundation
10	O Well you just defined it as	110	THE WITNESS: That would depend
11	10 percent	11	$(\mathbf{PV} \mathbf{MP} \mathbf{SIMPSON})$, So if you just took
1^{1}	To percent.	$1^{\perp \perp}$	Q. (DI IVIR. SIMPSON): SO II you just look
12	So if we took all the pumping outside		the model results and applied them without
13	of the trim line	13	attaching a model uncertainty.
14	A. Uh-huh.	14	A. I suppose the entity bearing the
15	Q and looked at 10 percent of that	15	largest risk would be the Department.
16	pumping	16	Q. And why is that?
17	A. Uh-huh.	17	A. Because it could be easily shown that
18	Q and its effect on the Buhl to	18	the model does have uncertainty.
19	Thousand Springs reach	19	Q. And so was that the basis for your
20	A. Uh-huh.	20	recommendation to Director Dreher that the model,
21	Q is that 10 percent de minimis? Is	21	if it were going to be used, had some uncertainty
22	that a small amount?	22	attached to it?
23	A. It's it would be less than	23	A. Somehow. It was important for the
24	10 percent of the total impact.	24	Department to somehow address uncertainty.
25	Q. Okay.	25	Q. And so the method that you recommended
	Page 83		Page 85
1	A. So then by my definition, which might	1	was, in your view, a placeholder until some better
2	not be valid, but it's how I chose to define it,	2	analysis could take place?
3	it would be de minimis.	3	A. That's correct.
4	Q. But let's just look at the total	4	Q. Allan, with respect to the current
5	volume, though.	5	third mitigation plan filed by the ground water
6	A. Okay.	6	districts, have you reviewed that plan?
7	O. From a volumetric standpoint	7	A. Are we leaving this?
8	A. Uh-huh.	8	O. For a bit.
9	$O_{}$ if you added up all the pumping	9	A For a bit
10	that occurred outside the trim line	10	O Is there something you'd like to
11	A III-huh	11	comment on it about?
12	$\Omega_{}$ and took 10 percent of that	12	A It shows that the Department trims to
13	A Uh-huh	13	Water District 130 and all the tables and in the
14	0	14	text and the Department does not trim to Water
15	that amount would be?	15	District 130
16	MP BPOMIEV: Objection Asked and	16	O And you're looking at a particular
17	answered This line of questioning was pursued at	17	Q. And you're looking at a particular
10	the delivery call bearing in 2007. The lieve	10	autor
10	with surtailment sconario, it identifies these	10	A. I can, an the tables, table 1, $table 2$, $table 4$
20	with curtainment scenario, it identifies these	20	table 2, table 3, table 4. \bigcirc With respect to table 1 and be
20	amounis. we've plowed this ground well before.	20	Q. with respect to table 1, you're
$\angle \perp$	THE WITNESS: 1 If I recall, I think it		looking at the two separate
22	was around 600,000 acre-feet. And so then	22	A. Yean, what is it? The fourth line
23	10 percent of that would be 60,000 acre-feet on	23	down.
24	the Buhl to Thousand Springs reach.	24	Q. Right.
25	O. (BY MR. SIMPSON): Okay. And that	25	A. And then the bottom line.

22 (Pages 82 to 85)

	Page 86		Page 88
1	O "10 percent trim line not clipped to	1	O Okay Are you familiar with how the
$\frac{1}{2}$	Water District 130" and then "10 percent trim line	2	figure of 2.6 cfs of replacement water was
3	clipped to 130 "	3	identified?
4	So you're testifying that the	4	A That was from a scenario that I ran
5	Department doesn't clip to the boundary of Water	5	O Well
6	District 130?	6	A Okay The 2.6 that's from the
7	Δ That's correct	7	6.9 percent
Ŕ	Ω Okay That with respect to either the	8	O Okay And so you have an
ğ	trim line identified for Snake River Farms or the	9	understanding of how the 2.6 cfs of replacement
10	trim line identified for Blue Lakes it wasn't	10	water requirement was calculated?
11	clipped to the boundary of 130?	11	A Ves
12	A No	12	Ω Okay Are you comfortable with the
13	Ω Specifically or factually?	13	manner in which that number was calculated: that
14	A Factually	14	is does it reflect the best scientific
15	Ω Okay	15	understanding of the relationship between the
16	A For a while Water District 140 didn't	16	numping that's occurring and the effect on the
17	exist With no mailbox there's no point in	17	spring flow?
18	sending a bill	18	Δ That's the way I see it that's two
19	But after 2007 and in the 2007	19	A. That's the way's see R , that's two outputs R and
20	orders the orders specifically say that Water	20	administrative post-modeling adjustment And I'm
21	District 140 is being organized And since then	21	comfortable with that It's arguably not the best
22	Water District 140 has been involved in both	22	available science. But we let teenagers drive
23	calls	23	and it's clearly not the best available science
24	Ω Okay And with respect to the	24	O So you think it would be better to
25	houndary between Water District 130 and Water	2.5	keen the teenagers off the road?
	Page 87		Page 89
1	District 120, is that the eastern boundary of the	1	A. I do.
2	trim line?	2	Q. Okay. Likewise
3	A. No. The trim line crosses that. It	3	A. I have one.
4	so happens that there's no irrigated acres.	4	Q. Yeah. Likewise, would we be better
5	Q. East of the Water District 130	5	off to use a different method to determine the
6	boundary?	6	calculation?
7	A. Right. So there's nobody to curtail.	7	A. It's possible that a better method
8	Q. No mailbox?	8	could be come up with. The hearing officer and
9	A. Yeah.	9	two directors are comfortable with the percentage.
10	Q. Okay. Any other comments that you	10	Q. Is it true that they're comfortable
11	would have on this document?	11	with the percentage, or did both the hearing
12	A. The if we take that out, then the	12	officer and Director Dreher in his approval of the
13	new information in here is the 1 percent trim	13	hearing officer's determination acknowledge that
14	line.	14	additional work needed to be done?
15	Q. Uh-huh.	15	A. My recollection is that the additional
16	A. Everything else has already been	16	work needed to be done on uncertainty.
17		117	Q. Not on spring-flow calculations?
18	covered. This fails to take into account the	1 1	
	covered. This fails to take into account the common ground water. And they are trimmed to the	18	A. Not on spring-flow calculations. I
19	covered. This fails to take into account the common ground water. And they are trimmed to the area of common ground water. That has to be.	18 19	A. Not on spring-flow calculations. I could be wrong.
19 20	covered. This fails to take into account the common ground water. And they are trimmed to the area of common ground water. That has to be. That's in the rules.	18 19 20	A. Not on spring-flow calculations. I could be wrong.Q. Okay. But if that were the
19 20 21	covered. This fails to take into account the common ground water. And they are trimmed to the area of common ground water. That has to be. That's in the rules. Q. Well, back then to my other questions	18 19 20 21	A. Not on spring-flow calculations. I could be wrong.Q. Okay. But if that were the recommendation by the hearing officer, would you
19 20 21 22	covered. This fails to take into account the common ground water. And they are trimmed to the area of common ground water. That has to be. That's in the rules. Q. Well, back then to my other questions on the ground water districts' mitigation plan.	18 19 20 21 22	A. Not on spring-flow calculations. I could be wrong.Q. Okay. But if that were the recommendation by the hearing officer, would you support that, based upon what you know?
19 20 21 22 23	covered. This fails to take into account the common ground water. And they are trimmed to the area of common ground water. That has to be. That's in the rules. Q. Well, back then to my other questions on the ground water districts' mitigation plan. Have you reviewed that mitigation	18 19 20 21 22 23	 A. Not on spring-flow calculations. I could be wrong. Q. Okay. But if that were the recommendation by the hearing officer, would you support that, based upon what you know? A. If a director came to me and asked me
19 20 21 22 23 24	covered. This fails to take into account the common ground water. And they are trimmed to the area of common ground water. That has to be. That's in the rules. Q. Well, back then to my other questions on the ground water districts' mitigation plan. Have you reviewed that mitigation plan?	18 19 20 21 22 23 24	 A. Not on spring-flow calculations. I could be wrong. Q. Okay. But if that were the recommendation by the hearing officer, would you support that, based upon what you know? A. If a director came to me and asked me to come up with something better, I would.

23 (Pages 86 to 89)

	Page 90		Page 92
1	A. I'd certainly try.	1	holders on the ESPA.
2	O. Do you think it's possible, based upon	2	O. Right. So then do you have an
3	the tools that you have available to you?	3	understanding that the purpose of not only
4	A. I have some ideas.	4	section 12 that you reviewed but also the
5	O Okay. Are those ideas consistent with	5	water-right transfer memo was to provide
6	the work that you've done in the past on	6	guidelines for ensuring that other water rights
7	regression analysis?	7	weren't injured as a result of a proposed
8	A That would be one.	8	transfer?
9	MR SIMPSON: Let's go ahead and mark this	9	A I suspect that that's why they have
10	as the next exhibit	10	the transfer process
11	(Exhibit 41 marked)	11	O And from your perspective, when you
12	O (BY MR, SIMPSON): Do you recognize	12	advocated for keeping the 5 percent threshold
13	Exhibit 41 Mr Wylie?	13	instead of 10 percent it was to ensure that the
14	A I suspect I was asked to review part	14	other water rights would not be injured as a
15	of this	15	result of that transfer?
16	O Well did you have any part in the	16	A To decrease the risk of having the
17	drafting or review of this transfer memo?	17	other water rights injured ves
18	A I like I said I suspect I was	18	O Do you believe that if the threshold
19	asked to review part of it There was a part on	19	were kent at 5 percent, it would further decrease
20	using the transfer tool	20	that risk that you identified?
21	O If you'd look at page 12	21	A So if they couldn't increase
22	A Yes some part of this	22	depletions in a reach by more than 5 percent that
23	O Paragraph 12 or subsection 12 on	23	would decrease the risk of causing injury to
24	page 12 is that part of the area that you were	24	others? 10 percent increases the risk of causing
25	asked to review?	25	injury to others.
	Page 91		Fe ana
1	Page 91	1	Page 93
1	Page 91 A. I think so.	1	Page 93 Q. So would the answer to my question be
1 2	Page 91 A. I think so. MS. McHUGH: Sorry. Was that page 12?	1 2 2	Page 93 Q. So would the answer to my question be yes, then?
1 2 3	Page 91 A. I think so. MS. McHUGH: Sorry. Was that page 12? MR. SIMPSON: Page 12. THE WITCHESS: Page 12 memory 12 week	1 2 3	Page 93 Q. So would the answer to my question be yes, then? A. I got kind of got lost in your
1 2 3 4	Page 91 A. I think so. MS. McHUGH: Sorry. Was that page 12? MR. SIMPSON: Page 12. THE WITNESS: Page 12, paragraph 12, yeah.	1 2 3 4	Page 93 Q. So would the answer to my question be yes, then? A. I got kind of got lost in your question, so I tried to restate it.
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1 2 3 4 5 6 7	Page 91 A. I think so. MS. McHUGH: Sorry. Was that page 12? MR. SIMPSON: Page 12. THE WITNESS: Page 12, paragraph 12, yeah. MS. McHUGH: Okay. Q. (BY MR. SIMPSON): So that's part of	1 2 3 4 5 6 7	Page 93 Q. So would the answer to my question be yes, then? A. I got kind of got lost in your question, so I tried to restate it. Q. I got lost in your answer, so I thought I'd try to help you out.
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24 (Pages 90 to 93)

	Page 94		Page 96
1	know I'm Dan Steenson representing Blue Lakes	1	A Ves
2	Trout Farm in this matter. We have had	2	Ω Okay And so as Lunderstand it you
3	conversation before	3	go through a process called calibration to tune
4	So do you mind if I at times call you	4	the model to reality that is to align the
5	Allan?	5	model's predictions with measured phenomenon: is
6	A Go shead	6	that correct?
	MP STEENSON: Okay I think I'd first		A To adjust the model so that model
l g	like to mark the next exhibit 42. It's a		A. To adjust the model so that model
G	one page document. And there are extra conies	a	measurements
10	(Exhibit 42 marked)	10	Ω And this is why as you said before
11	O (PV MP STEENSON): Allon do you	11	modelers like data because it's an opportunity to
12^{11}	c. (BT WR. STEENSON). Anali, do you	12	find out how well you did with the model and in
1 3	A Ves	12	addition to adjust the model to better reflect
11	A. 100. O Okay Do you recognize that to be	11	what you find through observable data; is that
15	Q. Okay. Do you recognize that to be	15	what you find through observable data, is that
16	10 percent error factor that you have been	16	A That's correct
17	describing during your testimony today?	17	A. That's context. O Olvey New the two issues that
18	A That's correct	18	Q. Okay. Now, the two issues that Mr. Simpson's been ealing you about that I'm here
1 0	MD STEENSON: Okoy Mark an	10	interested in today have to do with the 10 percent
20	Fyhibit No. 13	20	uncertainty and trim line on the one hand and the
21	(Exhibit 13 marked)	21	uncertainty and thin fine on the one hand and the
$\frac{2}{22}$	O (EV MP STEENSON): Allon would you	22	probably imagined
22	read that This is not something that you've seen	22	Now the question of model uncertainty
2.5 2.4	before. Take a moment to read that and then I'll	24	is directly related to if not synonymous with
25	ask you a question or two about it	25	the question of obtaining model accuracy; is that
	ask you a question of two about it.		the question of obtaining model accuracy, is that
	Page 95		Page 97
1	A. (Reviews.)	1	correct?
2	Okay.	2	A. They're related.
3	Q. Allan, I'll represent to you that this	3	Q. Okay. In other words
4	is a description of the scientific method that I	4	A. It's not true that all inaccuracy is
5	downloaded from a source on the Internet.	5	uncertainty.
6	And my question to you is whether you	6	Q. Okay. Explain that for me, would you.
7	agree generally with this description of the	7	A. If you know that the model's going to
8	scientific method, as you understand that method?	8	be inaccurate, you can compensate for that. But
9	A. I do.	9	uncertainty is inability to quantify that
10	Q. Okay. Would you add anything to it	10	inaccuracy.
11	that is not contained in the document, from your	11	Q. Okay. And in any case, uncertainty is
12	own perspective?	12	an issue for scientific or technical inquiry and
13	A. I don't think of anything right now.	13	resolution; isn't that correct?
14	Q. Okay. And is it fair from my layman's	14	A. Yes.
15	perspective to describe the ESPA model and models	15	Q. It is not an issue in terms of use of
16	of its kind as an effort to apply the scientific	16	the model that is subject to legal or policy
17	method to a problem?	17	considerations; correct?
18	A. Yes.	18	A. I don't know that for a fact.
19	Q. Okay. And if I understand the model	19	Q. Okay.
20	in, again, very basic layman's terms, it's a	20	A. I am not keenly tuned into policy and
21	mathematic representation of what is happening for	21	legal. All I know about legal I learned by
22	the ESPA in terms of ground water interactions	22	watching Perry Mason.
23		123	O And nonhome some of your interpations
~)	with surface water, and depletions and additions	23	Q. And perhaps some of your interactions
24	with surface water, and depletions and additions to those sources; is that generally very vaguely	24	with some of us in this room? Perhaps we've
24 25	with surface water, and depletions and additions to those sources; is that generally very vaguely correct?	23 24 25	with some of us in this room? Perhaps we've disappointed you. I don't know.

25 (Pages 94 to 97)

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	Page 98		Page 100
1	But in any case, in terms of	1	It's purely a mathematical phenomenon-based
2	evaluating model outputs and the confidence we can	2	analysis subject to the scientific method:
3	have in them, uncertainty is a technical or	3	correct?
4	scientific question subject to the scientific	4	A. Hopefully repeatable.
5	method; correct?	5	Q. Then I want to look back at the white
6	A. It there certainly are a lot of	6	paper with you. That's Exhibit No. 40, I think,
7	different ways people have used to try to evaluate	7	or is it 41?
8	uncertainty in computer models. And they've	8	A. 40.
9	generated a great deal of papers in the scientific	9	Q. 40. My understanding is that at least
10	press.	10	in your view the model is the best scientific tool
11	Q. In other words, defining uncertainty	11	available to us to evaluate the impacts of ground
12	is not really affected by the question of who one	12	water pumping on spring flows and spring rights;
13	thinks ought to be curtailed or who ought to bear	13	is that correct?
14	the burden of curtailment or a policy question	14	A. On reaches, yes.
15	such as the economic effects of curtailment,	15	Q. Okay. And it is the tool that the
16	uncertainty really has nothing to do with those	16	Department uses to evaluate the impacts of ground
17	considerations that I mentioned, does it?	17	water withdrawals and additions on springs as
18	A. Well, in my naive opinion, I think	18	well; correct?
19	that the policymakers should take into account	19	A. The the output then undergoes a
20	model uncertainty when they're making their policy	20	post-modeling administrative adjustment, yes.
21	decisions. And I am not in any position to tell	21	Q. And the post-modeling administrative
22	them how it should be done.	22	adjustment, is that process a scientific method
23	Q. But the reverse is not true, that is,	23	process, or is that a policy process, or do you
24	when you're asked to define uncertainty, your	24	know?
25	inquiry shouldn't be affected by who you or	25	A. That's a in my opinion, it's a
	Page 99		Page 101
1	Page 99 someone else might think ought to be curtailed or	1	Page 101 policy.
1 2	Page 99 someone else might think ought to be curtailed or the economics of curtailment or the burdens of	1 2	Page 101 policy. Q. Driven process; correct?
1 2 3	Page 99 someone else might think ought to be curtailed or the economics of curtailment or the burdens of curtailment? Your inquiry, then, should be a	1 2 3	Page 101 policy. Q. Driven process; correct? A. Correct.
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1 2 4 5 6	Page 99 someone else might think ought to be curtailed or the economics of curtailment or the burdens of curtailment? Your inquiry, then, should be a purely scientific one based on the scientific method; isn't that correct? A. Yes. And I think that's one of	1 2 3 4 5 6	Page 101 policy. Q. Driven process; correct? A. Correct. Q. It's not a technical process; correct? A. Not a technical process. Q. Okay. Now, the Department has relied
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26 (Pages 98 to 101)

	Page 102		Page 104
1	that this observation is correct.	1	somewhere. And I'm not sure what else they might
2	So my question is, do you agree with	2	be driving at with that third paragraph.
3	the observations and analysis in the first	3	O. Let me try to paraphrase it and see
4	paragraph at page 2?	4	what you think. In other words, if you want to
5	A. (Reviews.)	5	apply a 10 percent error factor for some other
6	Well, the first sentence there, it	6	reason, if you just like 10 percent as a number.
7	says. "The inference that ground water withdrawals	7	but you accept the model as the best science
8	outside the 10 percent trim line might have no	8	available, then the way to apply that 10 percent
9	effect on reach gains based on an assumed model	9	error factor would be that the model's results
10	uncertainty of plus or minus 10 percent is	10	might be 10 percent, might have 10 percent
11	incorrect."	11	uncertainty, plus or minus, with respect to any
12	Well, as I've testified, there are	12	well for which the model makes predictions
13	some cells that, based on limitations of the	13	anywhere, that would be consistent rather than to
14	number of significant digits, have no observable	14	draw a line in the sand and say wells beyond that
15	impact. And they're all outside the trim line.	15	line may have no impact, which, as you've
16	The trim line, the curtailment scenario	16	testified, is incorrect and can't be true, whereas
17	demonstrates quite conclusively that the cells	17	wells on this side of the line closer to the rim
18	outside the model, outside the trim line, do have	18	are treated as if there's no uncertainty
19	a measurable impact. So	19	associated with them?
20	Q. So it's true with respect to those	20	A. Ah.
21	wells	21	Q. As I paraphrased it, would you agree
22	A. There are	22	with that statement?
23	Q. Let me just finish.	23	A. Okay.
24	A. Okay.	24	Q. Is that a "yes"?
25	Q. It may not be true with respect to	25	A. That's a "yes."
		1	
	Page 103		Page 105
1	Page 103 those six-digit wells, if you will, that you	1	Page 105 O. Okay. Thank you. See, we get there.
1 2	Page 103 those six-digit wells, if you will, that you mentioned previously, this statement?	12	Page 105 Q. Okay. Thank you. See, we get there. Now, the second paragraph addresses
1 2 3	Page 103 those six-digit wells, if you will, that you mentioned previously, this statement? A. Very clearly there is a measurable	1 2 3	Page 105 Q. Okay. Thank you. See, we get there. Now, the second paragraph addresses really a separate issue, the question of whether
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27 (Pages 102 to 105)

	Page 106		Page 108	
1	"Allan, how should we apply uncertainty in using	1	evaluating, do you ever encounter the term	
2	the model?" that's really a different question	2	"de minimis" as a scientific term? Is it one you	
3	than what's "Allan, what's a de minimis impact?":	3	are familiar with and use as a scientist?	
4	correct?	4	A. No.	
5	A That's correct	5	O. None at all. Okay. Is there one	
6	Ω Now quickly and maybe you're	6	similar to that that you would use?	
7	familiar with it but take a glance through	7	A "Significant " "not significant "	
8	naragraph 2 and then I want to ask you whether or	8	O Okay All right I want to ask you a	
9	not you dispute any of the factual assertions or	9	little bit more about calibration and go into some	
10	the conclusions in paragraph 2?	10	detail with respect to Blue I ake spring flow and	
11	Δ (Reviews)	11	this will relate to the use of the concept of	
12	Well I would agree that the spring	12	spring percentage	
13	users the junior ground water wells outside the	13	I'd like to hear from you your	
14	10 percent trim line reduce spring flow by	14	description of model calibration what it is what	
15	one half to one third. But de minimis could he	15	that process is	
16	defined in many different wave	16	MR BROMIEV: Objection Asked and	
17	O Okay Do you think half of the impost	17	answered All of this ground was played at the	
1.0	Q. Okay. Do you unik han of the impact	18	2007 hearing	
10	lat ma make sure L set the susstien out is a	1 0	THE WITNESS: In brief it's a process of	
20	de minimie portion of the impact?	20	adjusting certain model parameters to maximize the	
20	A It I I think it could be defined	21	aujusting certain model parameters to maximize the	
∠⊥ 22	A. It I I tillink it could be defined	22	charmations	
22	has the ser defined in Ideba	22	OUSCI VALIDIIS.	
23	nash'i been defined in Idano.	23	Q. (DI WIR. STEENSON). And will does one	ŀ
24 25	Q. As a scientist of a numan being having	24	A Your hope is to convince yourself and	
2 J	a conversation with me nere, i m asking you what	2.5	A. Tour hope is to convince yoursen and	-
	Page 107		Page 109	
1	is your opinion? Do you think 50 percent of an	1	others that the resulting model predictions are	
2	impact is a de minimis portion of that impact?	2	meaningful.	
3	A. I could see how a director could	3	Q. And that they match observed	
4	decide that if 90 percent of the impact	4	measurements of reality?	
5	90 percent or more of the impact of a pumping is	5	A. By matching observed measurements of	
6	going elsewhere, that that is de minimis on the	6	reality, you convince people and yourself.	
7	reach in question.	./	Q. Okay. And what is steady-state	ł
8	Q. I'm asking for Allan Wylie's opinion.	8	calibration?	
9	And my question is, does Allan Wylie	9	A. That's often used in modeling. It's	
10	think 50 percent of the impact on a reach is a	10	rarely seen in the real world. But it's taking	
11	de minimis portion of that impact?	11	average conditions and average measurements and	
12	A. Well, clearly 50 percent to one-third	12	trying to match those. That's a condition that,	
13	of the impact is underliably significant, and so	13	if it existed, there could be continuous stresses	
14	not likely to be de minimis.	14	and inputs and outputs from the model.	
15	Q. Clearly it's not de minimis; right,	15	Q. Okay. And what is transient	
16	Allan? That magnitude of impact is clearly not	16	calibration?	
17	de minimis; isn't that correct?	17	A. That matches more real-world	ł
18	A. Well, it's clearly significant. And	18	situations where there are seasonal changes in	
19	I I hesitate to use "de minimis" because l've	19	aquiter use and spring flows and river flows.	1
20	read Dr. Scheüder's paper and realize that there's	20	Q. As you've described it, is there a	1
21	legal implications. So I don't know whether there	21	preference in your mind for transient calibration	1
22	is or is not, so I'm not going to	22	over steady-state calibration, or do they serve	
23	Q. Okay. Without asking you to offer a	23	different purposes?	1
24	legal opinion, in your work as a scientist in	24	A. They serve different purposes. Steady	[
	evaluating quantities of whatever you might be	25	state is often used in ground water modeling.	1

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28 (Pages 106 to 109)

	Page 110		Page 112
1	It's particularly if the calibration dataset	1	Lake? I think there's a bridge or something at
2	isn't long, it almost has to be used to constrain	2	the downstream end of the upper lake. Is it that
3	a short transient time period.	3	USGS gauge?
4	If the transient time period is long	4	A. It was if memory serves, they
5	enough, you can often not use in calibration the	5	between 1980 and 2002, somewhere in there they
6	steady state.	6	moved the gauge, which is why I said "gauges."
7	O. So where you have the data, is it	7	But there was some analysis they did to correct
8	preferable to do transient calibration over steady	8	the data after they between when they moved the
9	state?	9	gauge.
10	A. It's preferable, ves.	10	MR. STEENSON: Okay. I'm going to mark the
11	Q. And could you explain how the	11	next exhibit.
12	automatic calibration software PEST works? That's	12	(Exhibit 44 marked.)
13	P-E-S-T as an acronym.	13	Q. (BY MR. STEENSON): Allan, do you
14	A. Yes.	14	recognize Exhibit 44 to show what is sometimes
15	MR. BROMLEY: Same objection.	15	called the fit or show compare the measured
16	MR. STEENSON: I'd be happy to note a	16	data at Blue Lakes to the modeled data, and by
17	continuing objection if you'd like.	17	virtue of its calibration?
18	MR. BROMLEY: That's fine.	18	A. This is from the final report for
19	MR. STEENSON: Okay.	19	calibration of the ESPA model. And it's a
20	THE WITNESS: The software does that	20	comparison between the measured, that's the blue,
21	comparison between observed measurements and model	21	and the model data in the pinkish color.
22	output. And it makes adjustments in the	22	Q. Does what looks like a fairly tight
23	parameters that you allow it to to maximize those	23	overlap between the model and measured lines
24	alignments in the observed-in-field observations.	24	there, does that indicate that the model has been
25	It prints out a wealth of statistics throughout	25	calibrated by PEST so that it is predicting Blue
	Page 111		Page 113
1	the whole we area	1	Labor flows with a valatival which decreas of
	(DV MD STEENSON), Now con you		Lakes nows with a relatively high degree of
2	Q. (BI WIR. STEENSON). Now, call you	2	A It does a very well it does a good
	model regults at the below Milner springs and		A. It does a very well It does a good
5	river reaches? How was the model calibrated below	5	O Okay And the dataset at the Blue
6	Milner?	6	Lakes gauge do you deem it to be adequate for the
7	Δ The same way it was everywhere else		purpose of the transient calibration robust
8	Ω Using what data?	8	enough?
9	A Okay For the below Milner reaches	9	A It's got a in its favor it has a
10	the only data were steady-state data. And then	10	long time series A shortcoming is that there are
11	there were a few springs that we had data for in	11	fairly significant gains between Blue Lakes and
12	the transient.	12	the time it reaches the river. So it doesn't
13	O. And one of those springs was in the	13	capture all the flow.
14	Devil's Washbowl to Buhl reach, namely, Blue Lakes	14	O. The calibration might be improved by
15	Springs, for which you had the sufficient data to	15	some modifications to the data that's evaluated in
16	do the transient calibration; correct?	16	the transient calibration mode; correct?
17	A. That's correct.	17	A. Yeah, if if the purpose of the
18	Q. So the model is calibrated in	18	gauge were for model calibration, the gauge would
19	transient form or state to Blue Lake Spring flows?	19	have been located in a different place. But
20	A That's correct.	20	Q. Right.
0 1		1	
21	Q. And the source of the measurements at	21	A given that shortcoming, it's one of
21 22	Q. And the source of the measurements at Blue Lakes Springs, do you know where those	21 22	A given that shortcoming, it's one of the better datasets that we have.
21 22 23	Q. And the source of the measurements at Blue Lakes Springs, do you know where those measurements came from?	21 22 23	A given that shortcoming, it's one ofthe better datasets that we have.Q. Now, doesn't this indicate that the
21 22 23 24	Q. And the source of the measurements at Blue Lakes Springs, do you know where those measurements came from? A. USGS gauges.	21 22 23 24	 A given that shortcoming, it's one of the better datasets that we have. Q. Now, doesn't this indicate that the model can be used itself indirectly to evaluate

29 (Pages 110 to 113)

	Page 114		Page 116
1	on Blue Lakes Spring flows?	1	springs don't have data. I could calibrate this
2	A. This is certainly a compelling graph.	2	model a multitude of different ways and match
3	And, you know, if I were able to go to a	3	these flows and steal water from the adjacent
4	conference and present a modeling report. I would	4	springs upstream or down, and PEST wouldn't know
5	certainly include this graph in my presentation.	5	the difference because there's no data
6	O. This is like striking the mother lode	6	constraining it on the adjacent springs.
7	vein, isn't it, for modelers?	7	So in the end, even though the model
8	A. The problem is that there aren't	8	matches this shockingly well, in reality the
9	enough there are far more springs than there	9	underlying uncertainty is huge.
10	are springs with data. And there's nothing to	10	O. But it is this very same calibration
11	force the model to extract to use the right part	11	that you used to calibrate the model? Are you
12	of the aquifer to get water to this spring.	12	then suggesting that the uncertainty in the model
13	because not enough of the springs have data. It's	13	itself is huge?
14	not constrained.	14	A. Not at the reach.
15	So in other words, if we used if	15	Q. It seems to me you're pointing out a
16	the committee were to conclude that we can use it	16	flaw if you use this spring to calibrate the
17	for Blue Lakes Spring, use the model for Blue	17	model, which you said you did, it seems to me,
18	Lakes Spring, the way the trim line is currently	18	then, the same reason you're thinking you can't
19	defined, you could be in a really bad way.	19	use it for Blue Lakes, is the same reason you
20	Q. Now, the trim line, as we've	20	can't use the model for broadly below Milner?
21	discussed, has its own mortal flaws.	21	A. We have targets for all of the
22	But this avoids the issue, using the	22	reaches. So we can't steal water from the
23	model directly because it's been calibrated to	23	upstream reach because it has to match the
24	predict Blue Lakes' flows, avoids the need to	24	upstream reach also. We can't steal water from
25	consider reach gains; isn't that correct? It	25	the downstream reach because we have to match the
	Do		
	Page 115		Page 117
1	avoids the issue of the 10 percent uncertainty at	1	Page 117 downstream reach also. So there's very little
1 2	avoids the issue of the 10 percent uncertainty at the river gauges because you don't have to go down	1 2	Page 117 downstream reach also. So there's very little wiggle room for the reaches.
1 2 3	avoids the issue of the 10 percent uncertainty at the river gauges because you don't have to go down to the river to figure out the relationship	1 2 3	Page 117 downstream reach also. So there's very little wiggle room for the reaches. Q. Now, for the Devil's Washbowl to Buhl
1 2 3 4	avoids the issue of the 10 percent uncertainty at the river gauges because you don't have to go down to the river to figure out the relationship between what's happening in the aquifer and Blue	1 2 3 4	Page 117 downstream reach also. So there's very little wiggle room for the reaches. Q. Now, for the Devil's Washbowl to Buhl reach, the source of the data is Covington and
1 2 3 4 5	avoids the issue of the 10 percent uncertainty at the river gauges because you don't have to go down to the river to figure out the relationship between what's happening in the aquifer and Blue Lakes Springs, that is, because the model has been	1 2 3 4 5	Page 117 downstream reach also. So there's very little wiggle room for the reaches. Q. Now, for the Devil's Washbowl to Buhl reach, the source of the data is Covington and Weaver, correct, that was used for calibration?
1 2 3 4 5 6	avoids the issue of the 10 percent uncertainty at the river gauges because you don't have to go down to the river to figure out the relationship between what's happening in the aquifer and Blue Lakes Springs, that is, because the model has been calibrated to predict flows at Blue Lakes Springs?	1 2 3 4 5 6	Page 117 downstream reach also. So there's very little wiggle room for the reaches. Q. Now, for the Devil's Washbowl to Buhl reach, the source of the data is Covington and Weaver, correct, that was used for calibration? A. For version 1, we used Covington and
1 2 3 4 5 6 7	avoids the issue of the 10 percent uncertainty at the river gauges because you don't have to go down to the river to figure out the relationship between what's happening in the aquifer and Blue Lakes Springs, that is, because the model has been calibrated to predict flows at Blue Lakes Springs? A. Well, like I said with firearms,	1 2 3 4 5 6 7	Page 117 downstream reach also. So there's very little wiggle room for the reaches. Q. Now, for the Devil's Washbowl to Buhl reach, the source of the data is Covington and Weaver, correct, that was used for calibration? A. For version 1, we used Covington and Weaver to apportion the gains computed by
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1 2 3 4 5 6 7 8 9 10	avoids the issue of the 10 percent uncertainty at the river gauges because you don't have to go down to the river to figure out the relationship between what's happening in the aquifer and Blue Lakes Springs, that is, because the model has been calibrated to predict flows at Blue Lakes Springs? A. Well, like I said with firearms, horseshoes, darts, the smaller the target, the greater your uncertainty. And the target Buhl Devil's Washbowl to Buhl is a much bigger target.	1 2 3 4 5 6 7 8 9 10	Page 117 downstream reach also. So there's very little wiggle room for the reaches. Q. Now, for the Devil's Washbowl to Buhl reach, the source of the data is Covington and Weaver, correct, that was used for calibration? A. For version 1, we used Covington and Weaver to apportion the gains computed by Kjelstrom. So Kjelstrom gives an annual flux for the gains below Milner, and then we apportion those by calculating the percentages in the reach
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1 2 3 4 5 6 7 8 9 10 11 12 13	avoids the issue of the 10 percent uncertainty at the river gauges because you don't have to go down to the river to figure out the relationship between what's happening in the aquifer and Blue Lakes Springs, that is, because the model has been calibrated to predict flows at Blue Lakes Springs? A. Well, like I said with firearms, horseshoes, darts, the smaller the target, the greater your uncertainty. And the target Buhl Devil's Washbowl to Buhl is a much bigger target. You got to have lower uncertainty than 2- to 300 cfs at Blue Lakes. 1500 cfs is bigger. The reach what is it? 15 miles long, is a bigger	1 2 3 4 5 6 7 8 9 10 11 12 13	Page 117 downstream reach also. So there's very little wiggle room for the reaches. Q. Now, for the Devil's Washbowl to Buhl reach, the source of the data is Covington and Weaver, correct, that was used for calibration? A. For version 1, we used Covington and Weaver to apportion the gains computed by Kjelstrom. So Kjelstrom gives an annual flux for the gains below Milner, and then we apportion those by calculating the percentages in the reach in Covington and Weaver. Q. So which is the better database to rely on, the Covington and Weaver for the reach or this database at Plane Labor?
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$\begin{array}{c}1\\1\\2\\3\\4\\5\\6\\7\\8\\9\\0\\1\\1\\2\\1\\3\\1\\4\\1\\5\\6\\7\\8\\9\\0\\1\\2\\2\\2\\2\\3\\2\\4\end{array}$	avoids the issue of the 10 percent uncertainty at the river gauges because you don't have to go down to the river to figure out the relationship between what's happening in the aquifer and Blue Lakes Springs, that is, because the model has been calibrated to predict flows at Blue Lakes Springs? A. Well, like I said with firearms, horseshoes, darts, the smaller the target, the greater your uncertainty. And the target Buhl Devil's Washbowl to Buhl is a much bigger target. You got to have lower uncertainty than 2- to 300 cfs at Blue Lakes. 1500 cfs is bigger. The reach what is it? 15 miles long, is a bigger target. There's a lot going for the reach. Q. In the abstract. But here don't we have a graph that is showing us you said you would like to present this at a conference if you had the opportunity. Feel free to take it with you and do so as an exemplar example of a model predicting with high level of accuracy and a low level of uncertainty the relationship between the aquifer and Blue Lakes Springs. Doesn't this graph address the abstract concern about a small target?	$1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 11 \\ 13 \\ 14 \\ 15 \\ 17 \\ 18 \\ 9 \\ 21 \\ 23 \\ 24 \\$	Page 117 downstream reach also. So there's very little wiggle room for the reaches. Q. Now, for the Devil's Washbowl to Buhl reach, the source of the data is Covington and Weaver, correct, that was used for calibration? A. For version 1, we used Covington and Weaver to apportion the gains computed by Kjelstrom. So Kjelstrom gives an annual flux for the gains below Milner, and then we apportion those by calculating the percentages in the reach in Covington and Weaver. Q. So which is the better database to rely on, the Covington and Weaver for the reach or this database at Blue Lakes? A. If all we had were the springs with gauges, then we wouldn't be able to have a model. What we use the springs for was to force the model to match the seasonal amplitude, which is why Blue Lakes and Box Canyon work so well for us, because they have a nice, long time series. They miss some of the gains that happen below the reach, below the gauge, but that doesn't matter. What we were looking for was a
$\begin{array}{c}1\\2\\3\\4\\5\\6\\7\\8\\9\\0\\1\\1\\2\\1\\4\\5\\6\\7\\8\\9\\0\\1\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2$	avoids the issue of the 10 percent uncertainty at the river gauges because you don't have to go down to the river to figure out the relationship between what's happening in the aquifer and Blue Lakes Springs, that is, because the model has been calibrated to predict flows at Blue Lakes Springs? A. Well, like I said with firearms, horseshoes, darts, the smaller the target, the greater your uncertainty. And the target Buhl Devil's Washbowl to Buhl is a much bigger target. You got to have lower uncertainty than 2- to 300 cfs at Blue Lakes. 1500 cfs is bigger. The reach what is it? 15 miles long, is a bigger target. There's a lot going for the reach. Q. In the abstract. But here don't we have a graph that is showing us you said you would like to present this at a conference if you had the opportunity. Feel free to take it with you and do so as an exemplar example of a model predicting with high level of accuracy and a low level of uncertainty the relationship between the aquifer and Blue Lakes Springs. Doesn't this graph address the abstract concern about a small target? A. No. Since most of the adjacent	$1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 1 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 2 \\ 3 \\ 4 \\ 2 \\ 2 \\ 3 \\ 2 \\ 2 \\ 3 \\ 2 \\ 2 \\ 3 \\ 2 \\ 2$	Page 117 downstream reach also. So there's very little wiggle room for the reaches. Q. Now, for the Devil's Washbowl to Buhl reach, the source of the data is Covington and Weaver, correct, that was used for calibration? A. For version 1, we used Covington and Weaver to apportion the gains computed by Kjelstrom. So Kjelstrom gives an annual flux for the gains below Milner, and then we apportion those by calculating the percentages in the reach in Covington and Weaver. Q. So which is the better database to rely on, the Covington and Weaver for the reach or this database at Blue Lakes? A. If all we had were the springs with gauges, then we wouldn't be able to have a model. What we use the springs for was to force the model to match the seasonal amplitude, which is why Blue Lakes and Box Canyon work so well for us, because they have a nice, long time series. They miss some of the gains that happen below the reach, below the gauge, but that doesn't matter. What we use looking for was a seasonal amplitude. If we only had steady-state

30 (Pages 114 to 117)

	Page 118		Page 120
1	targets, we didn't have much data to show PEST	1	should be flowing at 100 cfs, but in order to
2	what the seasonal change in flux was. So that's	2	match this (indicating), it's flowing at 5.
3	why we went to the springs. And they provided us	3	O. Okay. Now, what are the other springs
4	with that data.	4	that you can think of in that reach? There's
5	I trust nobody, on the committee	5	Crystal: correct? Major spring within that reach.
6	anyway thought that that that would work for	6	A Springs that I'm familiar with in that
7	going to the springs because there's absolutely	7	reach are Devil's Washbowl Devil's Corral
8	nothing to force the model to get it the water	8	There's Allison, there's Crystal, and there
9	from the right area in the aquifer	9	there's Niagara That's the ones that I know
10	O So do you then believe that this	10	O Okay And those are major ones within
11	insupportable 20 percent allocation method is	11	that reach: correct?
12	preferable to the use of the model itself to	12	A. Uh-huh.
13	predict the impact of ground water withdrawals on	13	O. Okay. I'm going to hand you four
14	Blue Lakes Springs?	14	pages to be marked as the next exhibit.
15	A. So are you suggesting that as a	15	(Exhibit 45 marked.)
16	post-modeling adjustment that the director could	16	Q. (BY MR. STEENSON): So right now this
17	choose to use what happens to be coming out at the	17	analysis you can't defend uses this percentage
18	spring cell?	18	spring allocation based on this linear analysis
19	Q. And why would it need to be a	19	that really has absolutely nothing to do and
20	post-model adjustment? Can't you use the model	20	reflects in no way what is occurring in the
21	itself?	21	aquifer; correct?
22	A. No.	22	A. Correct.
23	Q. Okay.	23	Q. Correct. So at least with regard to
24	A. No, there's nothing to force it to get	24	Blue Lakes Springs, the model does connect what's
25	the water from the right area in the aquifer. A	25	happening at the springs to the aquifer; correct?
	Page 119		Page 121
1	rigorous analysis on uncertainty for the spring	1	A. It matches the observations.
2	would result in a huge uncertainty.	2	Q. Right.
3	MR. STEENSON: Okay. I'm just about done,	3	A. We don't know what it does to some of
4	I think, but I need to take a little break.	4	the other springs.
5	THE WITNESS: Okay.	5	Q. And the other springs you do have
6	(Recess.)	6	data. I want you to go through each of the ones
7	Q. (BY MR. STEENSON): Okay. Now, I'm	1 7	
8		/ /	that are indicated in the exhibit I gave you.
	trying to understand what you're telling me, and I	8	that are indicated in the exhibit I gave you. Devil's Corral, there is data?
9	trying to understand what you're telling me, and I think I'm getting closer, so bear with me.	89	that are indicated in the exhibit I gave you. Devil's Corral, there is data? A. Uh-huh.
9 10	trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's	8 9 10	that are indicated in the exhibit I gave you. Devil's Corral, there is data?A. Uh-huh.Q. What has been the analysis, or has
9 10 11	trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's Washbowl to Buhl reach; correct?	7 8 9 10 11	that are indicated in the exhibit I gave you. Devil's Corral, there is data?A. Uh-huh.Q. What has been the analysis, or has there been calibration there at Devil's Corral?
9 10 11 12	trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's Washbowl to Buhl reach; correct? A. Correct.	8 9 10 11 12	 that are indicated in the exhibit I gave you. Devil's Corral, there is data? A. Uh-huh. Q. What has been the analysis, or has there been calibration there at Devil's Corral? A. Yes.
9 10 11 12 13	 trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's Washbowl to Buhl reach; correct? A. Correct. Q. Okay. And your concern is that within 	8 9 10 11 12 13	 that are indicated in the exhibit I gave you. Devil's Corral, there is data? A. Uh-huh. Q. What has been the analysis, or has there been calibration there at Devil's Corral? A. Yes. Q. Calibration similar to what's been
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9 10 11 12 13 14 15	 trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's Washbowl to Buhl reach; correct? A. Correct. Q. Okay. And your concern is that within that reach we have calibration and good fit for Blue Lakes Springs? 	8 9 10 11 12 13 14 15	 that are indicated in the exhibit I gave you. Devil's Corral, there is data? A. Uh-huh. Q. What has been the analysis, or has there been calibration there at Devil's Corral? A. Yes. Q. Calibration similar to what's been done at Blue Lakes Springs; correct? A. Similar, yes. Q. Olyou, And then the next one is
9 10 11 12 13 14 15 16	 trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's Washbowl to Buhl reach; correct? A. Correct. Q. Okay. And your concern is that within that reach we have calibration and good fit for Blue Lakes Springs? A. Uh-huh. Q. But that there may not be the same 	7 8 9 10 11 12 13 14 15 16	 that are indicated in the exhibit I gave you. Devil's Corral, there is data? A. Uh-huh. Q. What has been the analysis, or has there been calibration there at Devil's Corral? A. Yes. Q. Calibration similar to what's been done at Blue Lakes Springs; correct? A. Similar, yes. Q. Okay. And then the next one is Davil's Washbowd
9 10 11 12 13 14 15 16 17 18	 trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's Washbowl to Buhl reach; correct? A. Correct. Q. Okay. And your concern is that within that reach we have calibration and good fit for Blue Lakes Springs? A. Uh-huh. Q. But that there may not be the same level of data for the other springs within that 	7 8 9 10 11 12 13 14 15 16 17	 that are indicated in the exhibit I gave you. Devil's Corral, there is data? A. Uh-huh. Q. What has been the analysis, or has there been calibration there at Devil's Corral? A. Yes. Q. Calibration similar to what's been done at Blue Lakes Springs; correct? A. Similar, yes. Q. Okay. And then the next one is Devil's Washbowl.
9 10 11 12 13 14 15 16 17 18	 trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's Washbowl to Buhl reach; correct? A. Correct. Q. Okay. And your concern is that within that reach we have calibration and good fit for Blue Lakes Springs? A. Uh-huh. Q. But that there may not be the same level of data for the other springs within that 	7 8 9 10 11 12 13 14 15 16 17 18	 that are indicated in the exhibit I gave you. Devil's Corral, there is data? A. Uh-huh. Q. What has been the analysis, or has there been calibration there at Devil's Corral? A. Yes. Q. Calibration similar to what's been done at Blue Lakes Springs; correct? A. Similar, yes. Q. Okay. And then the next one is Devil's Washbowl. Does that indicate that the Devil's
9 10 11 12 13 14 15 16 17 18 19 20	 trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's Washbowl to Buhl reach; correct? A. Correct. Q. Okay. And your concern is that within that reach we have calibration and good fit for Blue Lakes Springs? A. Uh-huh. Q. But that there may not be the same level of data for the other springs within that reach; correct? A. Correct. 	<pre>7 8 9 10 11 12 13 14 15 16 17 18 19 20</pre>	 that are indicated in the exhibit I gave you. Devil's Corral, there is data? A. Uh-huh. Q. What has been the analysis, or has there been calibration there at Devil's Corral? A. Yes. Q. Calibration similar to what's been done at Blue Lakes Springs; correct? A. Similar, yes. Q. Okay. And then the next one is Devil's Washbowl. Does that indicate that the Devil's Washbowl has been calibrated to the model, as was the case with Blue Lakes?
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9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	 trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's Washbowl to Buhl reach; correct? A. Correct. Q. Okay. And your concern is that within that reach we have calibration and good fit for Blue Lakes Springs? A. Uh-huh. Q. But that there may not be the same level of data for the other springs within that reach; correct? A. Correct. Q. And so in the absence of that data for the other springs, you think we can't rely on the model's predictions for Blue Lakes Springs; 	7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23	 that are indicated in the exhibit I gave you. Devil's Corral, there is data? A. Uh-huh. Q. What has been the analysis, or has there been calibration there at Devil's Corral? A. Yes. Q. Calibration similar to what's been done at Blue Lakes Springs; correct? A. Similar, yes. Q. Okay. And then the next one is Devil's Washbowl. Does that indicate that the Devil's Washbowl has been calibrated to the model, as was the case with Blue Lakes? A. Yes. Q. And the next one is Crystal. Is the case true there that Crystal
9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	 trying to understand what you're telling me, and I think I'm getting closer, so bear with me. We're talking about the Devil's Washbowl to Buhl reach; correct? A. Correct. Q. Okay. And your concern is that within that reach we have calibration and good fit for Blue Lakes Springs? A. Uh-huh. Q. But that there may not be the same level of data for the other springs within that reach; correct? A. Correct. Q. And so in the absence of that data for the other springs, you think we can't rely on the model's predictions for Blue Lakes Springs; correct? 	7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24	 that are indicated in the exhibit I gave you. Devil's Corral, there is data? A. Uh-huh. Q. What has been the analysis, or has there been calibration there at Devil's Corral? A. Yes. Q. Calibration similar to what's been done at Blue Lakes Springs; correct? A. Similar, yes. Q. Okay. And then the next one is Devil's Washbowl. Does that indicate that the Devil's Washbowl has been calibrated to the model, as was the case with Blue Lakes? A. Yes. Q. And the next one is Crystal. Is the case true there that Crystal has been calibrated through the model?

31 (Pages 118 to 121)

	Page 122		Page 124
1	O And with regard to Briggs does that	1	O Could you describe to me what it is
2	sheet there indicate that that's been calibrated	2	A It's a presentation I made at the last
3	through the model?	3	ESHMC modeling committee meeting on calibration
4	A. Briggs is not in this reach.	4	targets for version 2.
5	O. Not in the reach. Let's remove that	5	O. Okay. And give me an executive
6	from this exhibit.	6	summary of your presentation.
7	So then there's Niagara Springs	7	A. The executive summary is that I
8	Has there been an effort to calibrate	8	decided to do away with the steady-state targets.
9	Niagara Springs, or is there data that could be	9	and we included gauged reaches below Milner. And
10	used to calibrate Niagara?	10	we added one we added Rangen to the calibration
11	A. According to Cindy Yenter, the	11	target for the springs.
12	watermaster for Water District 130, no.	12	O. So is part of your executive summary
13	O. Now, you know, there are two	13	that you are proposing further transient
14	facilities there. There's the Idaho Power	14	calibration in the updating of the model, such as
15	facility and there's the Rimview facility.	15	is done at Blue Lakes Springs?
16	Has Cindy indicated to you that	16	A. We're going from 1980 to 2006. There
17	there's no way to measure the water, or the data	17	are Rangen is another fairly rich dataset that
18	hasn't been collected for purposes of calibration?	18	we're getting, go from 1980 to 2006. And we'll be
19	A. If memory serves, there's a third	19	able to get Blue Lakes and Box. And John Koreny
20	water user. And I've at the request of John	20	updated the Snake River Farm, and so we're
21	Koreny, I've gone there twice and met with Cindy.	21	including that. I trust John will be able to get
22	And she has convinced me that both times that	22	Crystal data, so we'll be able to update that.
23	there are so many adjustments based on time of the	23	And Box and Blue Lakes are USGS, so we'll have
24	year, where the water goes, who gets it, and what	24	those updated, and Devil's Washbowl is USGS also.
25	happens with it that it's difficult difficult	25	So longer time series and an additional spring.
	Page 123		Page 125
-		-	
Ţ	to truly quantify it. And if the purpose is to		And we're also in the process of installing gauges
2	get the seasonal, then she says it's not a proper		using the CAMP money on some additional springs.
3	dataset to use.	3	Q. Back to Exhibit 45, the prior one, in
4	Q. Okay. So if we could get a proper	4	addition to those springs that are indicated there
5	dataset for Niagara, what percentage of the spring	5	and Niagara, are there any other springs in the
ю 7	flow would we have to have calibrated, in your		Devil's washbowl to Buni reach for which you think
0	view, to be able to use the model to predict	0	Dhe Lales data and calibration before the
0	impacts at Blue Lakes Springs using the	0	Blue Lakes data and calibration can be used as a
9 10	calibration data I showed you, would we have to	10	basis for determining the impacts of ground water
11	make 100 percent of the spring now in this reach	11	A I would have to look at the Covington
12	THEASHED AND CALIFICATED. OF WOUND SOME (ESSEN	1	
<u> </u>	noraantaga ha adaguata?	12	and Weaver and probably even make another tour
13	percentage be adequate?	12	and Weaver and probably even make another tour
13 14	percentage be adequate? A. I suspect we could get by with some	12 13 14	and Weaver and probably even make another tour through the reach
13 14 15	percentage be adequate? A. I suspect we could get by with some lesser percentage.	12 13 14	and Weaver and probably even make another tour through the reach Q. Would you
13 14 15 16	percentage be adequate? A. I suspect we could get by with some lesser percentage. Q. Okay. And is that an area of inquiry that you're willing to take a look at?	12 13 14 15	and Weaver and probably even make another tour through the reach Q. Would you A before I could do that.
13 14 15 16 17	percentage be adequate? A. I suspect we could get by with some lesser percentage. Q. Okay. And is that an area of inquiry that you're willing to take a look at? A. We're always striving to get more of	12 13 14 15 16 17	and Weaver and probably even make another tour through the reach Q. Would you A before I could do that. Q. Sorry. Would you agree that if your concern about the lack of data for some of the
13 14 15 16 17	percentage be adequate? A. I suspect we could get by with some lesser percentage. Q. Okay. And is that an area of inquiry that you're willing to take a look at? A. We're always striving to get more of the springs included	12 13 14 15 16 17	 and Weaver and probably even make another tour through the reach Q. Would you A before I could do that. Q. Sorry. Would you agree that if your concern about the lack of data for some of the other springs in the reach can be resolved and the
13 14 15 16 17 18	percentage be adequate? A. I suspect we could get by with some lesser percentage. Q. Okay. And is that an area of inquiry that you're willing to take a look at? A. We're always striving to get more of the springs included. Q. In fact, this will be the last	12 13 14 15 16 17 18 19	 and Weaver and probably even make another tour through the reach Q. Would you A before I could do that. Q. Sorry. Would you agree that if your concern about the lack of data for some of the other springs in the reach can be resolved and the calibrations that need to be done and haven't been
13 14 15 16 17 18 19 20	percentage be adequate? A. I suspect we could get by with some lesser percentage. Q. Okay. And is that an area of inquiry that you're willing to take a look at? A. We're always striving to get more of the springs included. Q. In fact, this will be the last exhibit	12 13 14 15 16 17 18 19 20	and Weaver and probably even make another tour through the reach Q. Would you A before I could do that. Q. Sorry. Would you agree that if your concern about the lack of data for some of the other springs in the reach can be resolved and the calibrations that need to be done and haven't been done do get done, that it would be preferable to
13 14 15 16 17 18 19 20 21	percentage be adequate? A. I suspect we could get by with some lesser percentage. Q. Okay. And is that an area of inquiry that you're willing to take a look at? A. We're always striving to get more of the springs included. Q. In fact, this will be the last exhibit. Please mark that as 46	12 13 14 15 16 17 18 19 20 21	and Weaver and probably even make another tour through the reach Q. Would you A before I could do that. Q. Sorry. Would you agree that if your concern about the lack of data for some of the other springs in the reach can be resolved and the calibrations that need to be done and haven't been done do get done, that it would be preferable to use the model to predict the impact of ground
13 14 15 16 17 18 19 20 21 22	percentage be adequate? A. I suspect we could get by with some lesser percentage. Q. Okay. And is that an area of inquiry that you're willing to take a look at? A. We're always striving to get more of the springs included. Q. In fact, this will be the last exhibit. Please mark that as 46. (Exhibit 46 marked)	12 13 14 15 16 17 18 19 20 21 22	 and Weaver and probably even make another tour through the reach Q. Would you A before I could do that. Q. Sorry. Would you agree that if your concern about the lack of data for some of the other springs in the reach can be resolved and the calibrations that need to be done and haven't been done do get done, that it would be preferable to use the model to predict the impact of ground water numping on Blue Lakes Springs as opposed to
13 14 15 16 17 18 19 20 21 22 23	percentage be adequate? A. I suspect we could get by with some lesser percentage. Q. Okay. And is that an area of inquiry that you're willing to take a look at? A. We're always striving to get more of the springs included. Q. In fact, this will be the last exhibit. Please mark that as 46. (Exhibit 46 marked.) Q. (BY MR STEENSON): Are you familiar	12 13 14 15 16 17 18 19 20 21 22 23	and Weaver and probably even make another tour through the reach Q. Would you A before I could do that. Q. Sorry. Would you agree that if your concern about the lack of data for some of the other springs in the reach can be resolved and the calibrations that need to be done and haven't been done do get done, that it would be preferable to use the model to predict the impact of ground water pumping on Blue Lakes Springs, as opposed to this 20 percent allocation method that's been
13 14 15 16 17 18 20 21 22 23 24	percentage be adequate? A. I suspect we could get by with some lesser percentage. Q. Okay. And is that an area of inquiry that you're willing to take a look at? A. We're always striving to get more of the springs included. Q. In fact, this will be the last exhibit. Please mark that as 46. (Exhibit 46 marked.) Q. (BY MR. STEENSON): Are you familiar with Exhibit 46?	12 13 14 15 16 17 18 19 20 21 22 23 24	and Weaver and probably even make another tour through the reach Q. Would you A before I could do that. Q. Sorry. Would you agree that if your concern about the lack of data for some of the other springs in the reach can be resolved and the calibrations that need to be done and haven't been done do get done, that it would be preferable to use the model to predict the impact of ground water pumping on Blue Lakes Springs, as opposed to this 20 percent allocation method that's been adopted?
13 14 15 16 17 20 22 23 24 25	percentage be adequate? A. I suspect we could get by with some lesser percentage. Q. Okay. And is that an area of inquiry that you're willing to take a look at? A. We're always striving to get more of the springs included. Q. In fact, this will be the last exhibit. Please mark that as 46. (Exhibit 46 marked.) Q. (BY MR. STEENSON): Are you familiar with Exhibit 46? A. I believe so	12 13 14 15 16 17 18 19 20 21 22 23 24 25	and Weaver and probably even make another tour through the reach Q. Would you A before I could do that. Q. Sorry. Would you agree that if your concern about the lack of data for some of the other springs in the reach can be resolved and the calibrations that need to be done and haven't been done do get done, that it would be preferable to use the model to predict the impact of ground water pumping on Blue Lakes Springs, as opposed to this 20 percent allocation method that's been adopted? A. So if L could be convinced that enough

32 (Pages 122 to 125)

	Page 126		Page 128
1	of the flux was accounted for in that reach?	1	look like.
2	O. Yes.	2	O. What's the time frame for that work?
3	A. Then then the model could be used	3	A. Well, version 2 is supposed to be done
4	to directly determine the flow at Blue Lakes.	4	in July of 2009.
5	O. And it could then be used with less	5	O. Yeah. Okay. Beyond that facetious
6	uncertainty, correct, than is currently imputed as	6	response, Allan, what really is your
7	a result of the 10 percent error in the river	7	A. I think the uncertainty analysis would
8	gauges, since the river gauges would no longer be	8	certainly take three modeling committee meetings.
9	a factor?	9	so that would be six months after we finish
10	A. Well, with any luck at all, the	10	version 2.
11	current uncertainty definition would is going	11	O. Which may be when?
12	to go away. We're going to I'm very excited	12	A. Well, when we pushed it back in July.
13	about going and doing a rigorous uncertainty	13	we were going to get done in December. But I
14	analysis. So that placeholder is, I hope, going	14	haven't got a calibration dataset vet. So I don't
15	to go away.	15	think there's any hope of being done in December.
16	O. And I'm sorry if you discussed that	16	O. So in the meantime, if your concerns
17	during this deposition already, but when is your	17	about I guess what you are thinking is an
18	analysis that you're excited about doing going to	18	incomplete dataset for the other springs in the
19	begin?	19	Devil's Washbowl to Buhl reach can be resolved.
20	A. As soon as we finish calibrating	20	then I take it you would be certainly willing to
21	version 2.	21	talk with Blue Lakes' expert or others about the
22	O. Okay. And what are you going to do?	22	possibility of using the model directly here,
23	How will that analysis proceed?	23	given the calibration of the model? You're a
24	A. We've been talking in the ESHMC	24	scientist?
25	modeling committee meetings about how exactly	25	A. Uh-huh.
	Page 127		Page 129
1	how to go about that We've talked about various	1	Ω Is that a "wes"?
2	sources of uncertainty and we've talked about two	2	Q. Is that a yes : A I Π_{r} hub
2	different techniques And one possibility would	3	MR STEENSON: I think that's all I have
4	he using both of the techniques, which would be a	4	Thank you Allan Lannreciate it
5	third alternative	5	MR BROMIEV. So the question becomes now
6	One alternative is that instead of	6	what do we do? I've got some questions I want to
7	coming out of the modeling process with a model	7	ask But Candice I'm sure has some questions
8	you come out with a suite of models one of them	8	that she wants to ask So
g	being the favorite and the other models are used	9	MR STEENSON: I'm going to have to go get
10	to get a picture of what the uncertainty looks	10	a daughter here. I think pretty soon
11	like	111	(Recess.)
12	Into.		(1000035.)
	So maybe you have six one is your	12	(Mr. Simpson present)
13	So maybe you have six, one is your favorite the others are used as to get a	12 13	(Mr. Simpson present.) MR. BROMLEY: Back on.
13 14	So maybe you have six, one is your favorite, the others are used as to get a picture of what the uncertainty distribution might	12 13 14	(Mr. Simpson present.) MR. BROMLEY: Back on.
13 14 15	So maybe you have six, one is your favorite, the others are used as to get a picture of what the uncertainty distribution might look like	12 13 14 15	(Mr. Simpson present.) MR. BROMLEY: Back on. EXAMINATION
13 14 15 16	So maybe you have six, one is your favorite, the others are used as to get a picture of what the uncertainty distribution might look like.	12 13 14 15 16	(Mr. Simpson present.) MR. BROMLEY: Back on. EXAMINATION BY MR BROMLEY:
13 14 15 16 17	So maybe you have six, one is your favorite, the others are used as to get a picture of what the uncertainty distribution might look like. Another technique is to do kind of what I did before, which is to stretch the model	12 13 14 15 16 17	(Mr. Simpson present.) MR. BROMLEY: Back on. EXAMINATION BY MR. BROMLEY: O Allan Chris Bromley for the
13 14 15 16 17 18	So maybe you have six, one is your favorite, the others are used as to get a picture of what the uncertainty distribution might look like. Another technique is to do kind of what I did before, which is to stretch the model every which way you can and see what the extremes	12 13 14 15 16 17 18	(Mr. Simpson present.) MR. BROMLEY: Back on. EXAMINATION BY MR. BROMLEY: Q. Allan, Chris Bromley for the Department of Water Resources I guess to start
13 14 15 16 17 18 19	So maybe you have six, one is your favorite, the others are used as to get a picture of what the uncertainty distribution might look like. Another technique is to do kind of what I did before, which is to stretch the model every which way you can and see what the extremes of the predictions might look like. And by	12 13 14 15 16 17 18 19	(Mr. Simpson present.) MR. BROMLEY: Back on. EXAMINATION BY MR. BROMLEY: Q. Allan, Chris Bromley for the Department of Water Resources, I guess to start off with.
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13 14 15 16 17 18 19 20 21	So maybe you have six, one is your favorite, the others are used as to get a picture of what the uncertainty distribution might look like. Another technique is to do kind of what I did before, which is to stretch the model every which way you can and see what the extremes of the predictions might look like. And by stretching it, you still force it to be calibrated.	12 13 14 15 16 17 18 19 20 21	(Mr. Simpson present.) MR. BROMLEY: Back on. EXAMINATION BY MR. BROMLEY: Q. Allan, Chris Bromley for the Department of Water Resources, I guess to start off with. Allan, we've sat through discussions with John Simpson and Dan Steenson primarily about
13 14 15 16 17 18 19 20 21 22	So maybe you have six, one is your favorite, the others are used as to get a picture of what the uncertainty distribution might look like. Another technique is to do kind of what I did before, which is to stretch the model every which way you can and see what the extremes of the predictions might look like. And by stretching it, you still force it to be calibrated. And so it's possible to see how you	12 13 14 15 16 17 18 19 20 21 22	(Mr. Simpson present.) MR. BROMLEY: Back on. EXAMINATION BY MR. BROMLEY: Q. Allan, Chris Bromley for the Department of Water Resources, I guess to start off with. Allan, we've sat through discussions with John Simpson and Dan Steenson primarily about methods concerning the 10 percent uncertainty and
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13 14 15 16 17 18 20 21 22 23 24 25	So maybe you have six, one is your favorite, the others are used as to get a picture of what the uncertainty distribution might look like. Another technique is to do kind of what I did before, which is to stretch the model every which way you can and see what the extremes of the predictions might look like. And by stretching it, you still force it to be calibrated. And so it's possible to see how you can merge those two. You would stretch every one of the perhaps six models, and that would give you a broader picture of what the uncertainty might	12 13 14 15 16 17 18 19 20 21 22 23 24 25	(Mr. Simpson present.) MR. BROMLEY: Back on. EXAMINATION BY MR. BROMLEY: Q. Allan, Chris Bromley for the Department of Water Resources, I guess to start off with. Allan, we've sat through discussions with John Simpson and Dan Steenson primarily about methods concerning the 10 percent uncertainty and then spring apportionment to Blue Lakes and Clear Springs respectively. Was any of the information presented

33 (Pages 126 to 129)

	Page 130		Page 132
1	to you today new to you?	1	1 percent, the Mr. Simpson and I discussed the
2	A. No.	2	errors in there, so if we exclude those errors of
3	O. Was the information presented today	3	trimming the data to the Water District 130.
4	discussed at the 2007 hearing?	4	then and we exclude what was covered in the
5	A. Most of it, yes.	5	2007 hearing, then the 1 percent information is
6	Q. Do you know what wasn't?	6	what is new.
7	A. There were different expert reports	7	Q. This is the 1 percent uncertainty that
8	presented, but much of the information in the	8	the white paper assigns to the model?
9	expert the new expert reports were in previous	9	A. Well, the 1 percent trim line.
10	expert reports.	10	Q. The 1 percent trim line. Is that
11	Q. The information that was in	11	getting at what a de minimis impact would be; is
12	Dr. Brockway's expert report concerning spring	12	that your understanding?
13	apportionment to Clear Springs that was discussed	13	A. It could be. I I'm uncomfortable
14	this morning, was that in an expert report or	14	with what a true definition of "de minimis" might
15	discussed at the prior hearing in 2007?	15	be.
16	A. Yes. In Eric Harmon's report there	16	Q. Do you have any opinion as to where
17	was a very similar sort of analysis was	17	that 1 percent may have come from?
18	presented. I believe Dr. Brockway used some	18	A. I believe that what Mr. Koreny was
19	different different wells. And my recollection	19	trying to do was split the difference between the
20	is that Mr. Harmon did not use Clear Lakes Spring	20	10 percent and what's used in Colorado.
21	as one of his springs.	21	Q. And do you know what's used in
22	Q. Has anyone previously used Clear Lakes	22	Colorado?
23	Springs with this regression analysis that was	23	A. No. I did read Dr. Scheüder's expert
24	talked about?	24	report, but I don't remember.
25	A. I suspect that Laura Janczak did.	25	Q. Somewhere in the neighborhood of
		1	
	Page 131		Page 133
1	Page 131 Q. And are you aware approximately when	1	Page 133 1 percent?
1 2	Page 131 Q. And are you aware approximately when the Janczak paper or thesis was published or known	1 2	Page 133 1 percent? A. It's less than 1 percent.
1 2 3	Page 131 Q. And are you aware approximately when the Janczak paper or thesis was published or known to people?	1 2 3	Page 133 1 percent? A. It's less than 1 percent. Q. Okay. Mr. Steenson provided you with
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$1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 1 \\ 1 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 0 \\ 1 \\ 1 \\ 2 \\ 1 \\ 1 \\ 5 \\ 1 \\ 1 \\ 1 \\ 1 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2$	 Page 131 Q. And are you aware approximately when the Janczak paper or thesis was published or known to people? A. 2001. Q. So that was before the hearing, then? A. Yes. Q. The information in the white paper I can't remember what exhibit it was tagged at. MR. STEENSON: 40. MR. BROMLEY: 40. Okay. Q. Exhibit 40, the white paper that was submitted to the modeling committee by Koreny and Brockway, what's your opinion of the white paper? A. I felt it was a waste of committee time. The in my opinion, the trim line is a policy. And I don't believe that that's committee business. Much of the material there is already presented in between Ms. McHugh's examination of me and Mr. Simpson's examination of me in the hearing. (Ms. McHugh rejoins the proceedings.) Q. (BY MR. BROMLEY): The 2007 hearing? A. The 2007 hearing, much of that information was covered there. The new thing in there is the that they present the results of a	$ \begin{array}{c} 1\\2\\3\\4\\5\\6\\7\\8\\9\\10\\11\\23\\14\\15\\16\\17\\18\\9\\21\\22\\23\\24\\25\end{array} $	Page 133 1 percent? A. It's less than 1 percent. Q. Okay. Mr. Steenson provided you with Exhibit 43, which was a definition of the scientific method. A. Yes. Q. And I believe you read that and agreed with what it stated. Was the information presented to you in Exhibits 44 and 45 consistent with the scientific method as Mr. Steenson was asking you to apply them? A. Exhibit 44 and 45 were taken from the report, the final report that IWRRI published on calibration of version 1.1 of the model. And we tried to be very scientific and rigorous in calibration of the model. What Mr. Steenson was trying to drive at was using the model to calculate what the directly determined the flux at Blue Lakes Springs. That may or may not be scientifically defensible. I will I would want to look at quite a bit more data, much more carefully. Q. For what reasons would it not be defensible?

34 (Pages 130 to 133)

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	Page 134		Page 136
1	A I would want to make sure that enough	1	
2	A. I would want to make sure that chough	2	A. 103.
2	vishle colibration targets before I would be	2	Q. Alla A. Within the Fastern Snake Dlain
1	operation of the model to predict flow at the		A. WITHIN THE EASTERN SHAKE FIAM
ч	Plue Lakes Spring, Without sufficient data the	5	Aquilei.
6	model could be steeling water from up or	6	Q. Right. If a transfer proposed to hot
7	downstroom annings to holp it motoh Dlug Lalson as		actually move a point of diversion, would
0	abortized springs to help it match blue Lakes so	0	paragraph 12 be applicable?
0	Shockingly well.	0	A. Could you ask that again, please?
10	Q. By that do you mean that there aren't	10	Q. If the transfer was only proposing to
11	any other parameters that these other springs that	111	change the season of use of the nature of use but
1 1 1	The model tries to replicate what's measured at		not to actually change points of diversion, would
12 12	Blue Lakes Spring, and could take water from a	12	paragraph 12 be applicable?
13	different location that doesn't necessarily match	11	A. I don't know. I know a lot about the
14	reality?	14	model. I don't know anytning about transfers,
10	A. That's right. It could be doing	15	really.
10	unspeakable things to match this so well. And the	110	Q. Okay. And you may have covered some
1/	fact that it matches it so shockingly well, it's		of this with Mr. Bromley. I apologize for walking
10	seductive to a nonmodeler. To modelers, it makes	18	in late, so I don't mean to be redundant. But I
19	you suspicious that you're joining the liar's	19	wanted to follow up on some of the statements you
20	club.	20	stated about the ESPA and things looking bleak.
21	Q. The measurements in Exhibits 44 and	21	A. Okay.
22	45, did you say that these were from IWRRI?	22	Q. Do you recall that?
23	A. IWRRI's report on the final report	23	The assumption when you made those
24	on the model calibration.	24	statements was that the drought would continue; is
25	Q. Okay. And that, again, was available	25	that correct?
	Page 135		Page 137
1	prior to the 2007 hearing?	1	A. One of the scenarios we did was a
2	A. That's correct.	2	continuing drought, yes.
3	Q. And was any of this information	3	Q. So if the drought were to end or if
4	presented at the 2007 hearing?	4	there would be a series of wet years, that could
5	A. The final report is in the record. I	5	affect your statement?
6	don't recall talking about these graphs.	6	A. Yes.
7	MR. BROMLEY: Okay. I have nothing	7	Q. And you haven't done any analysis on
8	further.	8	what specific springs are most affected by
9	MS. McHUGH: Okav.	9	
10		1	drought, have you?
11	<u> </u>	10	drought, have you? A. No.
10	EXAMINATION	10 11	drought, have you? A. No. Q. And are you generally aware of the
ΤZ	EXAMINATION BY MS. McHUGH:	10 11 12	drought, have you? A. No. Q. And are you generally aware of the size of the ESPA and the amount of water generally
12	EXAMINATION BY MS. McHUGH: Q. I just have a few questions for you,	10 11 12 13	drought, have you? A. No. Q. And are you generally aware of the size of the ESPA and the amount of water generally known to be available in it?
12 13 14	EXAMINATION BY MS. McHUGH: Q. I just have a few questions for you, Dr. Wylie. I'm Candice McHugh, representing the	10 11 12 13 14	 drought, have you? A. No. Q. And are you generally aware of the size of the ESPA and the amount of water generally known to be available in it? A. The press frequently states that it's
12 13 14 15	EXAMINATION BY MS. McHUGH: Q. I just have a few questions for you, Dr. Wylie. I'm Candice McHugh, representing the ground water districts.	10 11 12 13 14 15	 drought, have you? A. No. Q. And are you generally aware of the size of the ESPA and the amount of water generally known to be available in it? A. The press frequently states that it's the size of Lake Erie.
12 13 14 15 16	EXAMINATION BY MS. McHUGH: Q. I just have a few questions for you, Dr. Wylie. I'm Candice McHugh, representing the ground water districts. Could I have you look at Exhibit 41, I	10 11 12 13 14 15 16	 drought, have you? A. No. Q. And are you generally aware of the size of the ESPA and the amount of water generally known to be available in it? A. The press frequently states that it's the size of Lake Erie. Q. Okay.
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35 (Pages 134 to 137)

	Page 138		Page 140
1	spring output from the Thousand Springs	1	analysis, did it actually attempt to explain or
2	A. Yes.	2	increase the actual amount of water that flows out
3	Q relating to the current spring	3	of the Snake River Farms spring complex?
4	discharge and over time?	4	A. I don't know if this is what you're
5	A. Yes.	5	asking or not, but my recollection, I don't recall
6	Q. And do you recall what that shows?	6	that Mr. Harmon used did a regression analysis
7	A. The graphs produced using the	7	for Snake River Clear Lakes Spring. My
8	Kjelstrom model?	8	recollection is that he did Blue Lakes and Box
9	Q. Yeah.	9	Canyon, but I it's been a couple of years since
10	A. It shows that spring discharges are	10	I've read his report.
11	still above what they were in 1900.	11	Q. When you read Mr. Harmon's report, was
12	Q. Are you aware of how much inflow there	12	it your impression that he was attempting to come
13	is to the aquifer from precipitation and tributary	13	up with a different percentage that the springs
14	underflow, generally?	14	should be considered to enjoy if a reach of a
15	A. Precipitation, tributary underflow,	15	river was increased?
16	incidental recharge, and river seepage total up to	16	A. My understanding was that Mr. Harmon
17	about 7 1/2 million acre-feet per year.	17	was presenting a different technique to use in
18	Q. And are you familiar with the amount	18	lieu of the percentage method to calculate to
19	of water that is consumed by ground water pumping?	19	determine the to apportion the reach gains to
20	A. About 2 million acre-feet per year.	20	the spring.
21	Q. Let me just look through my notes.	21	Q. And I'm sorry.
22	Are you aware of what direction the	22	A. Did that make any sense?
23	flow of water takes in the aquifer, generally?	23	Q. Yes, absolutely. Thank you.
24	A. Generally, from the northeast to the	24	And was his analysis the same as
25	southwest.	25	Dr. Brockway's or a little bit different?
	Page 139		Page 141
1	Page 139 Q. Are you familiar where the Pioneer	1	Page 141 A. My recollection is that they're very
1 2	Page 139 Q. Are you familiar where the Pioneer Mountains are in Idaho?	1 2	Page 141 A. My recollection is that they're very similar. He used different wells and different
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$\begin{array}{c}1\\2\\3\\4\\5\\6\\7\\8\\9\\0\\1\\1\\2\\1\\4\\1\\5\\6\\7\\8\\9\\0\\1\\1\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2\\2$	 Q. Are you familiar where the Pioneer Mountains are in Idaho? A. They are on the western edge of the plain. Q. Near Sun Valley? A. Yeah. I was going to try to reference them to the Lost River Range, but Sun Valley is good. Q. And you answered that question. And that's where the Lost River is located? A. Yes. Q. On the western side of the Eastern Snake Plain? A. That's correct. Q. Okay. The regression analysis that I believe Mr. Simpson questioned you about that Dr. Brockway had performed, do you recall that line of questioning? A. Yes. Q. Do you know, was that regression analysis presented by Clear Springs in the Thousand Springs hearing? A. No. There was one similar by Eric Harmon. 	$1 \\ 2 \\ 3 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 1 \\ 1 \\ 2 \\ 1 \\ 3 \\ 1 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 1 \\ 1 \\ 2 \\ 1 \\ 3 \\ 1 \\ 4 \\ 5 \\ 6 \\ 7 \\ 8 \\ 9 \\ 1 \\ 1 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2 \\ 2$	A. My recollection is that they're very similar. He used different wells and different springs, but the technique is very similar. MS. McHUGH: I don't have any further questions. Thank you. MR. SIMPSON: I just have a couple follow-ups. FURTHER EXAMINATION BY MR. SIMPSON: Q. Allan, do you recall your testimony at that hearing where you observed that the conceptual concept testified to by Mr. Harmon regarding the correlation between aquifer levels and spring flows should be looked at? A. I recall, yes. Q. And you identified that that's something the Department should continue to look at, is that not true? Well, do you believe that the Department should continue to look at those sorts of methods in order to better describe the relationship between the aquifer and spring flows, or is that something we should just put on the shelf and never look at again?

36 (Pages 138 to 141)

Page	142
Laye	그ㅋ스

1	It as I've said, it has a certain appeal.	1	scientifically rigorous, that I couldn't support
2	There are reservations, and we've talked about my	2	it. He assured me that it was a post-modeling
3	reservations. And those could be looked at, but	3	administrative adjustment. And I said okay.
4	it's	4	Q. Okay. At that time did you describe
5	Q. Well, just as a hydrogeologist, do you	5	to him that you had in your mind alternative
6	believe that that method should continue to be	6	methods for making that determination, such as the
7	analyzed?	7	regression analysis that you had completed on
8	A. Continue to be analyzed? I think it's	8	wells and springs shortly before that time?
9	known that it works, and has been known for more	9	A. No.
10	than 20 years	10	Ω Were you not given that opportunity
11	Ω Okay But the problem's been in some	11	or did you just not take advantage of it?
12	cases we just didn't have adequate data to take	12	A I generally I avoid getting
13	what we know that works to apply it on the ground:	13	involved in administrative decisions. I have
	would that he foir?	11	norte do without taking on additional
	Would that be fall?	1 5	prenty to do without taking on additional
10	A. That highl be why Director Drener	10	The second secon
10	didn't do it. I don't know.	10	Q. That's because you like your job?
	Q. Well, if you knew about it in 2001 or	11/	A. I like doing science.
18	shortly thereafter, the Janczak	18	Q. Okay.
19	A. Janczak.	19	A. I don't like making administrative
20	Q Janczak investigation, and then you	20	decisions. I really like doing science.
21	did your own investigation shortly after 2001,	21	Q. Do you ever have concerns that if you
22	then can you explain to me why you didn't look at	22	get involved in administrative decisions or making
23	that analysis when you were involved in the spring	23	administrative suggestions that your job would be
24	percentage calculation?	24	in jeopardy?
25	A. I did what the director asked me to.	25	MR. BROMLEY: Objection. Form.
	Page 143		Page 145
1	O. So the director asked you to compare	1	THE WITNESS: No.
2	Covington and Weaver to spring flows to come up	2	O. (BY MR. SIMPSON). Okay
3	with that percentage?	3	A I don't think my job would be in
4	A The director asked me to calculate	4	is a north of the large share and the second s
· ·		1 -	1000970V FIDIDE WORD DE SUCKED UD WILD
5	that percentage	5	administrative decisions instead of doing science
5	that percentage.	5	administrative decisions instead of doing science.
5 6 7	Q. In the manner that you did?	567	administrative decisions instead of doing science. I want to minimize the administrative decisions
5 6 7 8	that percentage.Q. In the manner that you did?A. And I had no idea how it was going to	5 6 7 8	administrative decisions instead of doing science. I want to minimize the administrative decisions and maximize the science.
5 6 7 8 9	 that percentage. Q. In the manner that you did? A. And I had no idea how it was going to be used. 	5 6 7 8 9	administrative decisions instead of doing science. I want to minimize the administrative decisions and maximize the science. Q. One last question, perhaps. You indicated just a few minutes ago that with respect
5 6 7 8 9	 that percentage. Q. In the manner that you did? A. And I had no idea how it was going to be used. Q. Okay. But he didn't give you the flavibility to some back and say "What about this 	5 6 7 8 9	administrative decisions instead of doing science. I want to minimize the administrative decisions and maximize the science. Q. One last question, perhaps. You indicated just a few minutes ago that with respect to the trim line document that Dr. Proclement and
5 6 7 8 9 10	 that percentage. Q. In the manner that you did? A. And I had no idea how it was going to be used. Q. Okay. But he didn't give you the flexibility to come back and say "What about this alternative method, the recreasion analysis?" 	5 6 7 8 9 10	 administrative decisions instead of doing science. I want to minimize the administrative decisions and maximize the science. Q. One last question, perhaps. You indicated just a few minutes ago that with respect to the trim line document that Dr. Brockway and Dr. Karany submitted to the table isolation.
5 6 7 8 9 10 11	 that percentage. Q. In the manner that you did? A. And I had no idea how it was going to be used. Q. Okay. But he didn't give you the flexibility to come back and say "What about this alternative method, the regression analysis?" 	5 6 7 8 9 10 11	 administrative decisions instead of doing science. I want to minimize the administrative decisions and maximize the science. Q. One last question, perhaps. You indicated just a few minutes ago that with respect to the trim line document that Dr. Brockway and Dr. Koreny submitted to the technical committee, is it fain to accurate the science to the technical committee, is it fain to accurate the science to the technical committee.
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37 (Pages 142 to 145)

	Page 146		Page 148
1	FURTHER EXAMINATION	1	FURTHER EXAMINATION
2	BY MR. STEENSON:	2	BY MR. BROMLEY:
3	O. I have one more question from the	3	O. Dr. Wylie, Allan, Mr. Simpson was
4	liar's club.	4	asking you about the forum in which the white
5	The exhibit that you were referring to	5	paper was presented.
6	is the graph you produced, was it not?	6	Irregardless of the forum, what's your
7	A. Yes.	7	opinion of the technical information that's
8	Q. And it's a reflection of calibration	8	contained in the white paper, Exhibit 40?
9	that you perform in service of a model that you	9	A. Most of it is not new. The new part
10	have at least had a significant hand in	10	is their proposal or illustration of the impact of
11	constructing; correct?	11	a 1 percent trim line, as opposed to a 10. That's
12	A. Correct.	12	new information.
13	Q. Okay. And so as we discussed, it may	13	Q. Okay. And the regression analysis, if
14	be very appropriate to utilize the calibration of	14	you could just explain to me briefly, what is a
15	the model to Blue Lakes Springs, in your mind, if	15	regression analysis?
16	any gaps in spring-flow data and calibration in	16	A. It's a mathematical procedure where
17	the Devil's Washbowl to Buhl reach can be filled;	17	you establish a relationship between two
18	correct?	18	variables, in this case one being the elevation of
19	A. Yes. If sufficient percentage of the	19	the water level in the aquifer observed in a well,
20	flux, the discharge in that reach is accounted	20	and a discharge at a nearby spring.
21	for.	21	And it turns out that that tends to
22	Q. And as we discussed, there are perhaps	22	be that's a linear relationship. The elevation
23	two major springs of five where additional data	23	to water level does a very good job of explaining
24	could be collected, but three of the five there	24	the discharge in the nearby spring.
25	has been calibration by you through the model;	25	Q. And this is a technique. Is this a
		•	
	Page 147		Page 149
1	Page 147 correct?	1	Page 149 new technique? an ancient technique? a more modern
1 2	Page 147 A. Correct.	1 2	Page 149 new technique? an ancient technique? a more modern technique? I'm just curious when it was
1 2 3	Page 147 correct? A. Correct. Q. So the gap may not be very large, and	1 2 3	Page 149 new technique? an ancient technique? a more modern technique? I'm just curious when it was developed, who developed it, if you have any idea?
1 2 3 4	Page 147 correct? A. Correct. Q. So the gap may not be very large, and we may not be very far away from being able to use	1 2 3 4	Page 149 new technique? an ancient technique? a more modern technique? I'm just curious when it was developed, who developed it, if you have any idea? A. It's used it's one of the equations
1 2 3 4 5	Page 147 correct? A. Correct. Q. So the gap may not be very large, and we may not be very far away from being able to use the calibration of the model to Blue Lakes Springs	1 2 3 4 5	Page 149 new technique? an ancient technique? a more modern technique? I'm just curious when it was developed, who developed it, if you have any idea? A. It's used it's one of the equations used in Modflow, so it's been around Modflow
1 2 3 4 5 6	Page 147 correct? A. Correct. Q. So the gap may not be very large, and we may not be very far away from being able to use the calibration of the model to Blue Lakes Springs to evaluate the impact of ground water withdrawals	1 2 3 4 5 6	Page 149 new technique? an ancient technique? a more modern technique? I'm just curious when it was developed, who developed it, if you have any idea? A. It's used it's one of the equations used in Modflow, so it's been around Modflow was published in 1989. So it's been around for 20
1 2 3 4 5 6 7	Page 147 correct? A. Correct. Q. So the gap may not be very large, and we may not be very far away from being able to use the calibration of the model to Blue Lakes Springs to evaluate the impact of ground water withdrawals on Blue Lakes Springs; correct?	1 2 3 4 5 6 7	Page 149 new technique? an ancient technique? a more modern technique? I'm just curious when it was developed, who developed it, if you have any idea? A. It's used it's one of the equations used in Modflow, so it's been around Modflow was published in 1989. So it's been around for 20 years.
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38 (Pages 146 to 149)