

1 the green shading, are those springs that may have permanent
2 water level impacts also?

3 A. No. The green are on the valley floor. And
4 you'll see because the model simulates ceasing of pumping
5 from the well field area in Kobeh Valley with the exception
6 of pumping that we've assigned to Bobcat Ranch and 3 F Ranch
7 continue on throughout the entire course of the model runs.

8 But since we've turned the pumping off as you'll
9 notice the columns on the right-hand side as you go further
10 in the time, those resources effectively fully recover at
11 least to within one foot.

12 Q. And then directing your attention to spring ID
13 637, do you see that?

14 A. Yes.

15 Q. And that was water right number 4768?

16 A. Okay.

17 Q. And I pulled those documents on the State
18 Engineer's web site. And that's that permit that was filed
19 originally in December of 1917. Did you look at those water
20 rights that you listed there?

21 A. I don't recall reviewing the details of that
22 permit. I will note though that all of these sources are
23 basically for, if you go to the spring table you'll note that
24 all of them are for stock water supply and/or their federally
25 reserved rights from the BLM. I would assume that those

1 rights would be addressed through the EIS and through the
2 mitigation measures that are agreed upon between the mine and
3 BLM. So the remainder of the rights to have to the springs
4 are stock water sources.

5 Q. And the only measurement at least on this
6 document or this table on that spring was taken in August of
7 2006?

8 A. Let me, if I may, I'm going to pull the spring
9 plate two. And yeah, I did want to confirm that I was
10 correct on this. All the springs basically in that vicinity
11 around Mount Hope there, they have continued to be monitored
12 by the mine on a quarterly basis. So there is -- And I think
13 it's their intent to continue that type of monitoring. I
14 don't know the details of the current monitoring plan or what
15 might be arrived at. But there is continuing monitoring
16 going on in that spring to document conditions?

17 Q. So you may have other information in your
18 possession that shows a spring flow different than what's
19 listed here?

20 A. I don't have with me, but the mine has been
21 collecting that data.

22 Q. And then there is one other spring --

23 A. You know what, I should further state on that, I
24 do know, however, that all the springs around Mount Hope in
25 general that they're all characterized as seasonal springs

1 with the exception of the zinc habit which is an artificial
2 discharge out of an old one added on the southeast side of
3 Mount Hope. But all the spring resources right in the
4 immediate vicinity of Mount Hope have been characterized as
5 basically as seasonal type springs. Nothing of regional
6 significance.

7 Q. And then going to spring ID 604 also in the blue
8 highlighting.

9 A. Okay.

10 Q. Do you know if you have any other spring
11 measurement data on that?

12 A. We also have that flagged as being within the
13 mine's monitoring network, existing monitoring network.

14 Q. And that's located in Diamond Valley, is that
15 correct, a spring that's going to dry up possibly?

16 A. Possibly. But again, it depends on the site
17 specific conditions then.

18 Q. And then directing your attention to figure one
19 in Exhibit 408 and --

20 A. Yes.

21 Q. Table 4.4-2 in Exhibit 39, volume one.

22 A. 4.4.2?

23 Q. Yes.

24 A. I have that table.

25 Q. That's your locations of your simulated pumping

1 well?

2 A. Table 4.4.2 is for the base case pumping.

3 Q. And --

4 MS. JOSEPH-TAYLOR: We've been disconnected in
5 the other room. Sorry, folks.

6 MS. PETERSON: Is it okay to go?

7 HEARING OFFICER WILSON: We're good. Go ahead.

8 Q. (By Ms. Peterson) So could you please explain on
9 figure one which are the five wells that have not been
10 drilled yet, your production wells that have not been
11 drilled.

12 A. Yes. In the green are the proposed locations
13 based on 2010, June 2010 filings for the state. The
14 locations that have not been drilled to date or explored to
15 date are 227 POP-3 and 226 on the south end. And in the
16 central part of the well field POO-1 and 224 have not been
17 explored to date.

18 Q. And 224 you said also; right?

19 A. That's correct.

20 Q. Okay. And then I looked at your percent total
21 well field production on Table 4.4-2.

22 A. Okay.

23 Q. And I total that of the total production based on
24 the number of wells that have drilled, I guess the
25 information for 44 percent of the proposed production?

1 A. I believe that's approximately correct.

2 Q. And so 56 percent of your production supply,
3 those wells have not been drilled yet; is that correct?

4 A. That's correct. In round numbers about half,
5 half the number and about half the supply is simulated in the
6 model as some locations we have not drilled test wells at to
7 date.

8 Q. And so all these wells I guess basically in the
9 central and southern portion of your proposed well field you
10 don't have any data for yet; is that correct?

11 A. For the south as well to -- well, for the south
12 at a location we're going to be pumping from is location 222,
13 yes.

14 Q. I'm sorry. What did you say?

15 A. Out at the location we're proposing for the well
16 field, the furthest south that we have test well location is
17 site 222. So the remining seven sites we have not drilled or
18 explored.

19 Q. And the proposal is under the monitoring plan
20 that this information gained from all the drilling of these
21 production wells would not be input in to the model and the
22 model wouldn't be updated until three years after production
23 of pumping starts? Based on your understanding of the
24 monitoring plan testified to by Mr. Rogers.

25 A. Yeah. And I actually haven't read the most

1 current version of that monitoring plan. And I do know that
2 in speaking to Mr. Rogers there's been discussions about at
3 least doing audits much earlier on in the process. But I
4 don't know specifically what is in writing and I really don't
5 even have the details of what specifically is being discussed
6 now as far as moving toward a final monitoring plan.

7 Q. Are you also aware that there are water right
8 applications sought to be approved in this proceeding for
9 points of diversion that are not these ten production wells?

10 A. In order for us to drill exploration sites we had
11 to file an application to change water to the locations that
12 we wanted to drill and potentially build a well. So I do
13 believe there's a number of those applications that supported
14 our drilling and efforts are still outstanding, they're still
15 listed as active application. So my knowledge though, this
16 represents the locations that the mine is proposing to the
17 extent that there are still pending applications on our
18 exploration sites which we had to file in order to gain
19 permission to drill there. It is not the intent to proceed
20 with pumping water in this location.

21 Q. And there is about, in your current pending
22 applications there are about 24 points of diversion, 24 wells
23 that are listed for all the applications sought to be
24 approved in this proceeding. Are you aware of that?

25 A. As Mr. Childress indicated, we've done a lot of

1 drilling out there so we had to file a lot of applications at
2 various points. Like Mr. Childress testified, there is about
3 40 wells that have been drilled in the region. So the 12
4 that you see on this picture, the ten in the well field, the
5 two construction water supply wells off to the right-hand
6 side off to the east, that to my knowledge is where the mine
7 is proposing to pump in Kobeh Valley and no where else to my
8 knowledge.

9 Q. Okay. Well, let me just tell you that
10 Application 73548 proposes -- which is proposed to be
11 approved in this proceeding has a point of diversion as well
12 number eight. Do you see that over on the right-hand side of
13 your figure?

14 A. Oh, yeah, right. And those -- Okay, the 12
15 locations to the south. Actually I think there's 13.
16 There's one to the north. Those are points of diversion that
17 correspond to the original applications filed for new
18 appropriation of water in Kobeh Valley. It's my
19 understanding that we filed in June 2010 applications to
20 change those on to the ten production well sites so --

21 Q. I have that the last application for this well
22 that hasn't been changed by anything else is 73548.

23 A. There may be some applications that need to be
24 cleaned up in the process here. There's been a series of
25 filings and change applications and for various purposes

1 including exploration including the original set of
2 appropriations. But again, the intent of the mine is they
3 want their water rights allocated to the ten primary
4 production wells and there's also some construction water
5 appropriations at the two TSF wells off to the east. But
6 that to my knowledge is what the mine is seeking from the
7 state.

8 Q. So Application 73549 going in to Well 9, 73550
9 going in to Well 11, 77526 going in to Well 223, which is not
10 even listed on this figure, 77553 which is going in to Well
11 2XF-2 which I believe Mr. Childress testified is over on the
12 other side of Whistler Mountain, 77171 going in to 214 which
13 is the carbonate well, and 76483 and 76486 which are going in
14 to Well 203 are not needed by the company at this time?

15 A. The only ones that I know about is those
16 associated with the test wells. So we mentioned that Test
17 Well 214, Test Well 203 and some other test well locations.
18 I do know that those applications were filed specifically for
19 the purpose of us being able to drill an eight-inch well. I
20 really don't know how the water rights applications have been
21 arranged down in the wells one through 13. I do know that
22 goes to the original application they appropriate but I don't
23 know anything else beyond that so I can't offer you any
24 clarity on those particular water rights.

25 Q. And do you know if wells, the applications that

1 are proposed to be put in to Well 206?

2 MR. DE LIPKAU: Objection. The witness says he
3 knows nothing further on any particular well and any
4 particular permit or application.

5 HEARING OFFICER WILSON: Well, I'll let you ask
6 the question and see if he knows or not. Go ahead,
7 Mr. Smith.

8 MS. PETERSON: Oh, I didn't finish my question.
9 Well, are you going to present a witness on all your water
10 right applications?

11 HEARING OFFICER WILSON: There's no further
12 witnesses, is that correct, Mr. De Lipkau, for direct?

13 MR. DE LIPKAU: I'll answer the question. We
14 introduced an exhibit which was objected to by counsel which
15 was upheld by the hearing officer which was based upon public
16 record to explain where the water goes and in to what well.
17 We do not intend to present any witness to describe that
18 because it's public record. Nothing is simpler. No witness
19 can sit there without all the files in front of him and tell
20 anybody where a portion of this application went and where a
21 portion of that certificated permit went. It's just beyond
22 anybody's memory. We tried to simplify it. It was objected
23 to. So I think it's a done deal.

24 MS. PETERSON: You know, it was objected to
25 because there was going to be no witness that was going to be

1 able to testify to it because they didn't want to put
2 Mr. Zimmerman on and that was the witness that was going to
3 testify to it. So I think you need to characterize the
4 record correctly.

5 HEARING OFFICER WILSON: Don't talk to Mr. de
6 Lipkau please.

7 MS. PETERSON: Sorry.

8 HEARING OFFICER WILSON: I'll let you ask the
9 questions of Mr. Smith if he knows. He may not know. He's
10 indicated he may not have knowledge of all the water rights.
11 To the best of his knowledge if he knows he can answer the
12 questions. If he doesn't know, I'm sure he'll say "I don't
13 know." Go ahead and ask your question.

14 MS. PETERSON: Thank you.

15 Q. (By Ms. Peterson) Looking at Table 4.4-2, Well
16 206, do you see that?

17 A. Yes.

18 Q. And the percent total well field production for
19 that well is proposed to be five percent?

20 A. In the base case that's correct.

21 Q. 350 gallons per minute?

22 A. Yes.

23 Q. And my records show that Application 79934
24 through 79939 are all points of diversion, applications with
25 points of diversion on Well 206. Do you happen to know what

1 the diversion rate or the acre-feet requested by those
2 applications are for this well?

3 A. I do not. But what I do know is that this
4 distribution was provided to our legal counsel when they were
5 developing the change applications filed in June of 2010. So
6 I have to trust that there's sufficient diversion rate on
7 each of these wells to support the level of pumping we
8 simulated. But I don't know anything about the cumulative
9 total diversions on any of the water rights.

10 MS. PETERSON: It might be a good time for a
11 five-minute break so I can determine how much more I have to
12 do and you don't all have to look at me while I'm looking at
13 my notes.

14 HEARING OFFICER WILSON: That's fine. We've been
15 going about an hour. Let's make it a short break. Let's try
16 to get back at 3:40 please.

17 MS. PETERSON: Thank you.

18 (Recess was taken)

19 HEARING OFFICER WILSON: Continue with
20 cross-examination of Mr. Smith.

21 MS. PETERSON: Thank you.

22 Q. (By Ms. Peterson) Mr. Smith, based upon your
23 prior testimony I gathered that your impression is that the
24 difference of opinion regarding the five-foot drawdown versus
25 the ten-foot drawdown contour is what you consider to be an

1 issue between the BLM and Eureka County. Did I hear your
2 testimony correctly?

3 A. Ultimately as it's been portrayed in this report
4 and reported out, we had to rely upon direction of the BLM on
5 that matter.

6 Q. Do you have any objection to using the five-foot
7 drawdown contour for the State Engineer's purposes?

8 MR. DE LIPKAU: Excuse me. I'm going to object.
9 The Court remanded the matter for the State Engineer to hear
10 and review the model submitted to the BLM, period. That is
11 what we've done. That's a hypothetical question.

12 MS. PETERSON: My question is a hypothetical
13 question?

14 HEARING OFFICER WILSON: Could you read that
15 back.

16 (Question was read back)

17 HEARING OFFICER WILSON: Go ahead and answer it.

18 MR. DE LIPKAU: Excuse me. I haven't had my
19 objection ruled upon.

20 HEARING OFFICER WILSON: The objection is
21 overruled. Please answer the question, Mr. Smith.

22 THE WITNESS: The State Engineer has the full
23 understanding and the capabilities to run this model, has the
24 full ability to pass judgment on the drawdown predictions out
25 of the model. If the state sees fit that they want to review

1 the model predictions at different thresholds, five feet or
2 whatever threshold you may be interested in looking at,
3 please, it's a tool, you can use it to your discretion.

4 Q. (By Ms. Peterson) Does the State Engineer have
5 this version of this model? Because I know you said it was
6 proprietary?

7 A. They do. You have to buy MODFLOW SURFACT. And
8 to my knowledge the state does have that code and they have
9 all the same files that have been provided to everybody to be
10 able to fully run and review the model.

11 Q. So you have made in I guess putting the ten-foot
12 contour in to the model you have made no professional
13 judgment about whether that's adequate to determine impacts
14 or potential impacts; is that correct?

15 A. First off, I don't put the contour in to the
16 model. Can you maybe rephrase your question.

17 Q. In having the ten-foot contour in the model,
18 that's not based on your professional judgment; is that
19 correct?

20 A. The ten foot contour is just processing of the
21 output from the model.

22 Q. The determination to show --

23 A. Again, we have depicted that threshold at the
24 direction of the BLM.

25 Q. Not based on any professional judgment that you

1 yourself have made?

2 A. Well, if I personally would have disagreed with
3 that threshold then certainly I would have had the
4 opportunity to voice my opinions during the process. I am
5 personally fine with using ten feet as a threshold. Again,
6 hopefully I've qualified how the model should be used. And
7 really when we start to project out to that level of drawdown
8 there are uncertainties in any model and it depends on really
9 how it's being used for the purpose of the BLM and their
10 report and what they want to report it out, I think the
11 ten-foot level is sufficient. It doesn't mean that there is
12 going to be a void of responsibility or actions taken outside
13 of that ten-foot threshold. It's just a matter for reporting
14 out levels of drawdown.

15 Q. Wasn't the contour for the pit model in the last
16 hearing at a five-foot level contour?

17 A. At the State Engineer's, yeah, in 2008 I utilized
18 a five-foot threshold and that was subsequently requested to
19 be changed for the EIS process.

20 Q. Appendix E, do you have that in front of you?

21 A. Appendix E was that?

22 Q. E as in Edward.

23 A. Yes.

24 Q. It's the spring inventory?

25 A. Yes. This is spring -- Not inventory. Well, the

1 spring database.

2 Q. Okay. I was just reading from the top. It says
3 spring inventory.

4 A. Right. And on the title, spring database to
5 accompany spring inventory map.

6 Q. So just so I understand this, is every spring
7 ID'd here on the left-hand side a spring that you found on
8 the ground?

9 A. Absolutely not.

10 Q. Okay.

11 A. These are from various data sets, the primary
12 data set being the national hydrogeography database published
13 by the USGS. And that information to my understanding is
14 compiled from mapped springs on a seven and a half minute
15 topographic scale.

16 Q. And so there's certain springs identified on this
17 exhibit that you do have data for; correct?

18 A. That's correct.

19 Q. And I see on all of these there is one date
20 sampled for all these springs?

21 A. The database includes a flow measurement at a
22 particular date but it does not include an inventory of all
23 measurements made over time or from all sources.

24 Q. So just on the first page are you indicating that
25 you could have other data for this spring other than in 2007?

1 A. For some springs that are in the act of
2 monitoring that, yes.

3 Q. And those are the springs basically around the
4 pit; is that correct?

5 A. That is some of the springs. There is also, and
6 this was testified to to some degree in 2008, there's been
7 regional spring inventories made early in the process to
8 collect baseline data. In fact, I believe that's where a lot
9 of this information is derived from. That included
10 canvassing and visiting over 200 spring sites to document
11 baseline conditions. That was repeated by the mine, I
12 believe, for one or two events.

13 Q. Well, I guess I could just only find data, one
14 data point, I guess, from 2006 and 2007 for all of these.
15 And so I didn't know if for some reason why this wasn't
16 updated, if you had additional information.

17 A. Boy, there's a lot of additional information out
18 there on many different aspects of this project. We've
19 compiled what we felt was representative data for the
20 document to define the springs. Every spring, every spring
21 has a variable inflow. This was not an effort that was
22 intended to document all the variabilities within this
23 database. It was not an effort of that sort.

24 Q. So I'm turning to page 187 of Exhibit 39, top
25 paragraph, last sentence of that first paragraph, "Eureka

1 Moly has collected baseline spring flow measurements
2 throughout the area of projected maximum extent of projected
3 drawdown, appendix E."

4 A. Yes.

5 Q. Do you see that statement?

6 A. Yes.

7 Q. Is appendix E supposed to show baseline spring
8 flow measurements as opposed to just a one-time data point?

9 A. Again, it's not that data set. It's basically
10 identifying where we have made measurements. It's reporting
11 out a measurement. It's not intended to report out every
12 measurement that's being made or has been made. However, I
13 would say that if -- well, yeah, it just wasn't intended to
14 do that. It wasn't intended to go to that degree.

15 Q. To be a baseline?

16 A. It was intended to document where we have
17 collected baseline data, where we have collected data. It
18 wasn't intended to be a comprehensive archive of all spring
19 flow measurements. That was not the intent.

20 Q. And are these, all these springs within the
21 production maximum extent of the ten-foot drawdown in
22 appendix E?

23 A. Oh, absolutely not. There's I think close to
24 1100 sites from the various databases compiled throughout the
25 study area which is much more extensive than the ten-foot

1 drawdown threshold.

2 Q. So I mean it's confusing to me that you represent
3 that this is, to me it represents that these are baseline
4 spring flow measurements throughout the area of the projected
5 maximum of a ten-foot drawdown and then you reference
6 appendix E. And you're telling me, I think you're telling me
7 that this data is not in this appendix E?

8 A. Well, again, the intent was to show where we had
9 data. It was not intended to show all the data that is
10 available.

11 Q. And then the report discusses the northern shift
12 of your proposed well field?

13 A. A scenario with a northern pumping distribution.

14 Q. And that increases the carbonate percentage to 17
15 percent?

16 A. It does. And in that scenario we have increased
17 pumping to 12 percent of the total from 206.

18 Q. And when was Well 206 pump tested?

19 A. In the summer possibly in to the fall of 2008.

20 Q. And that was for 31 days?

21 A. That's correct.

22 Q. And that well had a very slow recovery?

23 A. That's my recollection.

24 Q. Is it still recovering today?

25 A. Oh, I have no idea.

1 Q. And then Exhibit 40 was Mr. Childress' report?

2 A. Yes.

3 Q. And the information from Exhibit 40 was put in to
4 Exhibit 39; is that correct?

5 A. No. There is a summary of some of that
6 information is included in Exhibit 39, a summary of some of
7 the data. But obviously much more detail and much more
8 extensive data is presented on the well field testing program
9 in Exhibit 40 than is summarized in Exhibit 39.

10 Q. Have you read Exhibit 40?

11 A. I have.

12 Q. And I could not find the opinions that
13 Mr. Childress expressed today in Exhibit 40. Do you know if
14 those opinions are in Exhibit 40?

15 A. Exhibit 40 is meant to be a data reporting
16 document and interpretation. And it also provides
17 interpretation of aquifer testing.

18 Q. And then turning to calibration statistics?

19 A. Okay.

20 Q. I know the range on the observed head in this
21 model is 1,962 feet; is that correct?

22 A. That's correct.

23 Q. And would you agree that the observed range and
24 head in the last model in Exhibit 116 was 1,736 feet?

25 A. Oh, I have not looked at that value. That could

1 be the case. We drilled additional wells at Mount Hope and
2 those are some of the highest altitude wells that we have in
3 our data set, over 7,000 feet in altitude.

4 Q. What's the elevation of Mount Hope?

5 A. I don't know the exact elevation.

6 Q. And I know in your opinion you expressed earlier
7 the reasons you thought that there was no flow between
8 Roberts Mountains and I guess the production wells in that
9 area; is that correct? You testified to was based upon the
10 springs were at the top of the mountain. Do you recall that
11 testimony?

12 A. No, not phrased in that manner.

13 Q. Did you know that there were flooded cells still
14 in the model prior to seeing Ms. Oberholtzer's report?

15 A. Absolutely, absolutely. In fact, we paid close
16 attention to that and that was presented in an earlier draft
17 of this report. It was reported to the group. Stakeholder
18 being probably in 2009 at some point. At that point there
19 was no further discussion. And honestly I thought everybody
20 was satisfied with the -- how we had addressed that issue.
21 There's absolutely no technical issues with flooded cells in
22 the model now that need to be addressed.

23 MS. PETERSON: No further questions.

24 HEARING OFFICER WILSON: Thank you. Ms. Ure.

25 MS. URE: Yes. Thank you.

1 CROSS-EXAMINATION

2 By Ms. Ure:

3 Q. Good afternoon. My name is Therese Ure and I'm
4 representing protestant Ken Benson. And I just have a few
5 questions. First of all, can you give me your definition of
6 what a transitional storage is?

7 A. Transitional storage occurs when you pump in a
8 well. It is the depletion of water out of an aquifer matrix
9 within the cone of depression created by the well.

10 Q. Okay. Let's see. On Exhibit 408 and then page
11 two, at the bottom it says, paragraph two, "The shift of
12 pumping distribution geographically to the south in Kobeh
13 Valley and in to the alluvial aquifer system rather than the
14 carbonate rock aquifers at the base of Mount Roberts, Roberts
15 Mountain results in less projected drawdown." Is that shift
16 to the south talking about just south of the well field or
17 are you talking about Bobcat Ranch?

18 A. No. This is working -- This is a shift that
19 maintains the ten points of diversion for the well fill but
20 redistributes the rate of pumping more to the south, the
21 southern most wells versus the base case that was simulated.

22 Q. Okay. We went over Table 4.4.8 through 4.4.9 and
23 is it fair to say that approximately 32 of the line items, so
24 whether it's a spring or a well there's 32 listed that have a
25 water right number associated with them approximately?

1 A. Let me just count them quickly for us. I have
2 25, however, I have noted that one of those is an error in
3 location and should not be included in the list. And I've
4 also indicated that four of the remaining 24 are now owned by
5 Kobeh Valley Ranch, LLC. And by the way, those four are
6 Permits Number 9440, 9441, 9442 and 9552. So that leaves a
7 remaining 20 water rights that we've identified within that
8 ten-foot predicted drawdown.

9 Q. Okay. So like the springs and the wells listed
10 in Table 4.4.8 and 4.4.10 might be a duplicate of what's on
11 the water right list?

12 A. Well, not all of those sites have water right
13 permits. And where they do, we have noted those on 4.4.8 and
14 4.4.10 in the second column from the right.

15 Q. So if we were to add all three tables together
16 with those water right certificates we would have a total
17 number of water rights that are affected in the ten-foot
18 drawdown area?

19 A. Well, you should find, you should be able to
20 cross-reference these tables so that if it's listed as having
21 a water right on Table 4.4-10 in column three then you should
22 also find that water right cross-reference listed on Table
23 4.4-9.

24 Q. Okay. But just to confirm then, those, all of
25 these on these charts are within the ten-foot drawdown area

1 and that may have permanent impact?

2 A. That's correct.

3 Q. Ms. Peterson briefly asked you about the 31-day
4 pump test that was completed on Well 206. Do you recall
5 that?

6 A. Yes.

7 Q. Is it true that this pump test was at a rate of
8 1400 to 1500 gallons per minute?

9 A. That's my recollection.

10 Q. And then you stated that you didn't know if that
11 well had fully recovered. Do you know if it was fully
12 recovered after one year?

13 A. I do not know. I only know that it was very slow
14 to recover immediately after we conducted the pumping test.

15 Q. Okay. I'm going to stick with Well 206 here for
16 a minute. On Table 4.4-2.

17 A. Okay.

18 Q. This table states that the simulated rate for
19 Well 206 is 350 gallons per minute; correct?

20 A. That's correct.

21 Q. And then the percentage of the total well field
22 that's proposed for that well is five percent; is that
23 correct?

24 A. That's correct.

25 Q. Are you aware that the water rights applications

1 for Well 206 are requesting 10,000 gallons per minute?

2 A. I'm not aware of the duties for each of the
3 permits. I'm not aware of the water right issues.

4 Q. And I don't recall, when did you say those, the
5 last round of amendments happened to the mine's water right
6 applications?

7 A. There was a set of change applications filed, I
8 believe, in June of 2010 to reallocate water rights for the
9 project to the ten well field points of diversion.

10 Q. And was this five percent out of Well 206 and the
11 350 gallons per minute determined before those amendments?

12 A. Yes, it was.

13 Q. So it's the mine's intention is to only withdraw
14 350 gallons per minute out of Well 206; correct?

15 A. Under the base case of course the mine would like
16 some flexibility based on observations of performance and
17 drawdown, et cetera, but the base case now is intended to
18 produce about five percent over the long run from that well.

19 Q. So assuming that the water right applications are
20 for 10,000 gallons per minute out of Well 206, it's the --
21 the mine has no intention of fully developing those water
22 rights, would that be fair to say?

23 A. The mine is not intending to pump that point of
24 diversion at that kind of rate. That I do know.

25 MS. URE: Okay. I have no further questions.

1 HEARING OFFICER WILSON: Thank you.

2 Redirect?

3 MR. DE LIPKAU: No redirect.

4 HEARING OFFICER WILSON: I believe staff has some
5 questions.

6 EXAMINATION

7 By Mr. Felling:

8 Q. On your page 36 and page 38 of Exhibit 39 --

9 A. Was that 36, Mr. Felling?

10 Q. That will work. There's a statement to the
11 effect that there is greater precipitation in these basins
12 under recent studies than suggested by the Reconnaissance
13 study and that that suggests that there are generally greater
14 quantities of water in the overall hydrogeologic system. Are
15 you implying that there is more recharge because there's more
16 precipitation?

17 A. Well, it's possible.

18 Q. And are you implying that there is more discharge
19 than has been estimated?

20 A. That is possible also.

21 Q. And what is that amount?

22 A. I do not know. That would require a more
23 detailed type of studies analysis, which I know have been
24 ongoing for several years now by the USGS. I actually try to
25 measure the ET rates, more accurately map the vegetation

1 types and arrive at hopefully more accurate number of
2 discharge.

3 Q. Have they done so to date? Have they revised
4 their discharge or recharge estimates?

5 A. Not to my knowledge.

6 Q. Okay. Can you have more recharge without having
7 more discharge?

8 A. Not in most circumstances.

9 Q. Okay. On page 119 there's a statement that
10 limits -- And that would be the second full paragraph that
11 says the maximum ET rate is constrained to 4.75 feet per
12 year. And where does that apply?

13 A. The maximum ET rate is a value that we have to
14 input in to MODFLOW as part of the module. It defines a
15 relationship of ET discharge as a function of depth to
16 groundwater. So the maximum ET rate is a value that we
17 associate with zero depth to water.

18 Q. And are you aware of any -- Are you aware of a
19 situation where that's a reasonable estimate for ET in
20 Diamond Valley or Kobeh Valley?

21 A. Well, ET max is not -- should not be confused
22 with actual ET. Again, it's an input parameter in to a
23 model. If you recall in the 2008 hearing we discussed their
24 relationship with depth how MODFLOW requires a maximum ET
25 rate to be defined and then a depth, extinction depth to

1 where there's zero rate. And that finds a linear
2 relationship with depth that the model will apply in each
3 cell to extract water out.

4 So if you recall in 2008, the model I was giving
5 more latitude to that number. I normally treated that as a
6 calibration parameter to where I will adjust that up or down
7 so that I'm getting some geographic max to the flux. I've
8 been more concerned about calibrating the fluxes.

9 But this is an item to where we had to work
10 through this issue with the period of years and I concur that
11 it's a reasonable assumption to anchor that, to constrain
12 that to the potential evapotranspiration.

13 Very rarely in the model do you have the water
14 level actually right at the surface for the model. Usually
15 it's somewhere, somewhere in depth. Somewhere the actual
16 rate is coming out somewhere down in depth on that curve.
17 Does that make sense?

18 Q. I'm aware of the need to have a maximum and that
19 it's part of the calibration process. What I'm concerned
20 with is that maximum amount should be based on reality. 57
21 inches is a lot of ET. Are you familiar with our consumptive
22 use report for northern Nevada?

23 A. Yes.

24 Q. In that report we have a shallow open water ET
25 rate of just three and a half feet?

1 A. Uh-huh.

2 Q. And you have an estimate that's significantly
3 greater than that for basically shallow open water. And I
4 realize you use that as an anchor for a linear relationship.
5 But do you know of any places in Diamond Valley where you
6 might actually have physically that amount of ET?

7 A. I don't think ET max is a real number on the
8 ground. Again, it's defining a function that we have to
9 establish in the module. It's not, I don't believe it's
10 representing an actual spot or location or occurrence on the
11 ground. It's really just defining that linear relationship
12 with declining ET with depth.

13 Q. Why shouldn't it be a real number?

14 A. Well, the problem you run in to is -- I'll have
15 to draw an example here. In the model we have a defined
16 number of acres for all of our phreatophytes based on
17 Reconnaissance value. And we have under that average ET
18 rates. That might be about a ten-third defensible foot say
19 for shrubs. And where that is occurring is it's some average
20 depth to water. If you were to pick any spot on the ground
21 say where USGS might establish a micrometeorological
22 measurement station, it's going to be higher or lower.

23 But what we're trying to do in the model is get
24 an average rate coming out of the model has to be fairly
25 similar to that average rate defined in the Recon report or

1 what I've established for the total volume. So we have an
2 area that correlates to the areas mapped by the Recon. We
3 have an average value coming out of the model. Using those
4 two functions I mentioned, the ET depth and the max, we have
5 an average value coming out of the model that is very similar
6 to the average value for the USGS report.

7 We have to -- in every model that I've worked on
8 we've had to always use ET max rate that's greater. And part
9 of the -- I think part of the difficulty and the problem with
10 this is I don't think it's in reality an exact linear
11 function. It's actually some type of curve function. But
12 MODFLOW is a model. It's a simplification process. We have
13 to assume just a linear relationship to depth. In reality,
14 it's probably some type of log function with depth or, you
15 know, it's trying to fit a linear condition to probably a
16 non-linear process.

17 Q. Do you know how many flooded cells would be in
18 any of these ET areas?

19 A. Very few, very few. We could look on the map
20 that Ms. Oberholtzer produced. I could tell you that in
21 Kobeh Valley we can look at the flooding, there's only a few
22 cells that would reside in the ET area and they're not
23 flooded by greater than ten feet. So the potentiometric
24 flood in those cells is very close to the last service.

25 Q. Okay. In your transient simulation how much did

1 you simulate in pumping in Diamond Valley in let's call it
2 acre-feet per acre? In your transient simulation you
3 simulate pumping in Diamond Valley?

4 A. Well, the conversion I think if I'm understanding
5 the question. The conversion we used is 2.5 feet of
6 consumptive water use per irrigated acre.

7 Q. And in using that 2.5 feet through time in your
8 transient calibration some time in the mid-1980s the
9 transient calibration essentially didn't work anymore, is
10 that -- You significantly overestimated drawdown from about
11 the mid-80s to the present. Is that accurate?

12 A. Yeah. But let's be clear there, it's the water
13 level trends we were trying to match were not -- were
14 irregular during that time frame. We were trying to match
15 water levels that were not behaving in a steady declining
16 matter.

17 Q. Right. So that's a -- that should have been a
18 red flag to you. Was it?

19 A. Well, yes. I actually spent many, many hours
20 looking at this because I wanted to come up with a clever
21 solution to explain this. But if you start to, you know,
22 just do some back-of-the-envelope computations, to have
23 curtailed pumping over say five, ten-year period, even by
24 maybe five or ten feet, the loss over that ag area, which we
25 see that phenomena is regionally occurring, that's a huge

1 volume of water. And then I can start to play with adjusting
2 pumping rates, putting in large volumes of water, assuming
3 your 1983 had an excessive volume of recharge. But the
4 volumes of water we're talking about are large. You can
5 totally turn pumping off for that time period --

6 Q. Okay.

7 A. -- and create a pretty good match, but we know
8 that didn't occur either.

9 Q. Okay. When they originally were pumping in
10 Diamond Valley they flood irrigated; is that correct?

11 A. I'm not aware of that. I'm not aware of that.

12 Q. Well, if I were to represent to you that when
13 they started irrigating in Diamond Valley they didn't have
14 pivots would you accept that?

15 A. What time frame?

16 Q. Originally in the 1960s?

17 A. In the 1960s? That could be the case. The
18 aerial photography that I have looked at and we've utilized
19 did not go back that far.

20 Q. And when one flood irrigates or even irrigates
21 with a pivot there's a variable amount of water that gets
22 past the root zone and gets back in to the aquifer; is that
23 right?

24 A. Yes, yes.

25 Q. But if the aquifer -- if the water table is down

1 some depth won't there be a delay in the amount of time it
2 would take for that water to get to the aquifer?

3 A. Yes. Over time the depth to water was at one
4 point less than a hundred feet but it has declined to greater
5 than a hundred feet overtime. So there is some timing there.

6 Q. So did you consider how much water could be
7 stored in the unsaturated zone and the time it might take for
8 that water to actually get back to the water table?

9 A. I did not consider that aspect, no, I did not
10 consider that.

11 Q. When you have a calibration failure, which is
12 essentially what we see in Diamond Valley, there has to be
13 some explanation that's not mathematical, I should say. It's
14 a conceptual shortcoming. Would you agree there?

15 A. Well, I don't agree in calling this a failure. I
16 think there are errors. And if you look at the statistics
17 from the gradient calibration, I still think we're doing a
18 reasonable job of calibrating conditions. We are over
19 projecting some, but the greater uncertainty is the
20 assumptions we apply going forward in time, what the real
21 pumping rates will be.

22 Q. In looking at your hydrographs and you have a
23 selection here but certainly not all of them, would you agree
24 that there's a large part of Diamond Valley where drawdown is
25 overestimated by 20 to 30 feet over the calibration period?

1 A. Well, let's -- Let me actually look at the
2 hydrographs. There are some that are that magnitude. But
3 there's actually quite a few that are a better fit than that.
4 I believe we present 14 locations.

5 MS. PETERSON: Could you just identify for the
6 record what you're looking at.

7 THE WITNESS: Yes. I'm sorry. I'm looking at
8 Figure 4.1-33. And there's that particular -- for that
9 particular occasion it's about 25 -- Excuse me. The model
10 actually is overpredicting about 25 feet for the year 2000.
11 And Figure 4.1-34 the model is actually underpredicting the
12 actual elevation by about 30 feet. So there is one
13 counteracting example right there.

14 The next one, hydrograph 4.1-35.

15 Q. (By Mr. Felling) Mr. Smith, if I can just
16 interrupt you briefly.

17 A. Okay.

18 Q. Do you have all of the calibration wells in this
19 report?

20 A. These are all the transient calibration wells
21 that we utilized, all the timed series.

22 Q. All Diamond Valley is printed in this report?

23 A. No. These are 14 wells that we selected
24 throughout the agricultural area.

25 Q. But it's not all of them?

1 A. No. There's another set of data that takes
2 snapshots in time. So this is the -- This is what we call
3 the timed series data point that we established in the model.
4 So there's 14 of those. And they tended to have fairly
5 complete historic records. We were looking for sites that
6 had some good running trends of data.

7 But there's another body of transient data also
8 that's just snapshots in time, all the models that were
9 measured during those snapshots in time. So I don't know --

10 Q. Would you say that there's either a change in the
11 pumping rate or there's an additional source of water later
12 in the calibration period than there is early in the
13 calibration period?

14 A. Well, I would say that it's possible.

15 Q. What other explanation might there be?

16 A. Well, again -- Well, there's a lot of variables.
17 It could be that there is additional recharge that came in in
18 some wet time frames. It could be a lot of issues suggested.
19 It could be water recharging down through the vetos zone. It
20 could be that, honestly the data for pumping starts with the
21 NWR pumping inventory. I really don't know the accuracy on
22 that data set. Our sums of 2.5 consumptive use, I think
23 that's pretty accurate. It matches well with the publication
24 of this year.

25 The water level measurements, there's a lot of

1 different things you can look at and consider on the water
2 level measurement data. We discussed one of them, the spring
3 versus a mix of summer and spring measurements.

4 There's a number of things that I actually have
5 looked at, you know, in an attempt to approve. Still, I will
6 contend though that we've done a reasonably good job in
7 Diamond Valley, certainly well enough to accomplish what
8 we're trying to do is to have a reasonable representation of
9 the flow system in Diamond Valley also. And I think we've
10 achieved that. It's certainly not perfect.

11 Q. You discussed a number of springs at the south
12 end of the playa, 16 springs, but I don't know where they all
13 are but you showed them on one of your figures and we don't
14 need to find that figure. But you mentioned that they were
15 dried up springs. And from the agricultural pumping in
16 Diamond Valley is that accurate?

17 A. That's my interpretation.

18 Q. And how much did the water table decline at those
19 springs at the south end of the playa?

20 A. I would have to defer to the model. But my
21 recollection is perhaps on the order of probably ranging
22 anywhere from ten -- probably ten feet or possibly greater.

23 Q. Do you say the model is accurate in the south end
24 of the playa?

25 A. I believe it's doing a reasonably accurate job in

1 the conditions.

2 Q. Are you familiar with the two of those USGS wells
3 at the south end of the playa that have a very long period of
4 record?

5 A. I don't recall looking at that data.

6 Q. You didn't use them in your calibration and I was
7 wondering, I was wondering why you wouldn't have used these
8 two USGS wells that have a 60-year period of record in your
9 calibration.

10 A. Did we use those as point data rather than
11 transient calibration data?

12 Q. No. For the transient simulation.

13 A. Let me just to make sure I'm clear on this also.
14 I would like to see -- The transient targets are shown on
15 4.1-30. And can you tell me if those wells are situated on
16 that trigger?

17 Q. I can tell you that they're not in the data set.

18 A. Mr. Felling, the reason I'm questioning that is
19 because our data set is built off of downloads from NWIS,
20 National Well Information System, along with compiling data
21 from NDWR. But I do see that we have points along the
22 southern end of the playa, however, they are not our timed
23 series calibration points, but we do have calibration,
24 transient calibration targets along the south end of the
25 playa.

1 Q. Okay. If I were to -- How do I want to say this?
2 If I were to state to you that based on existing data both in
3 your database and on the website that the water level decline
4 at the south end of the playa is less than five feet over the
5 entire period of record --

6 A. Okay.

7 Q. -- would you disagree?

8 A. Well, first off let's look at what the model said
9 because it might actually be very similar to that.

10 Q. It's not similar to the model.

11 A. Okay.

12 Q. That's the issue.

13 A. Okay.

14 Q. And really where I'm going here, Mr. Smith, is
15 that with really less than five feet of water level decline,
16 many, many, many springs have dried up?

17 A. Uh-huh.

18 Q. Do you think that that is unusual?

19 A. Again, I think that was a water table condition
20 on the south end. So no, every foot that we take down that
21 water table condition is going to have an effect. But I
22 would point out though that at Thompson Ranch, which is
23 further to the north, I've measured the depth to water in
24 that spring flow as six feet below the ground. So right away
25 I know that the physical drawdown at that location further to

1 the north has been greater than five feet.

2 Q. I don't argue that.

3 So I guess the next thing I want to address is
4 the ten-foot contour. And I won't go to so much to is ten
5 feet important, but it has something to do with your, with
6 the reliability of the ten-foot contour in general. And you
7 addressed this briefly in cross by Ms. Peterson. How much
8 confidence do you have as a modeler in this ten-foot contour
9 50 years in the future at some place in bedrock or alluvium
10 or anywhere at some -- at the perimeter of the operation?

11 A. Well, certainly the confidence level is not
12 great. It's not high. There's a lot of assumption in the
13 model that, furthermore we don't have any transient
14 calibration, long term transient calibration in Kobeh Valley
15 to help refine the model, until we gain higher confidence in
16 the local area where we do the testing but in particularly up
17 in the mountain block areas. So I have assigned different
18 potential levels of confidence to different areas of the
19 graphic. But certainly that will improve overtime as we can
20 observe.

21 Q. So would you say you're confident or moderately
22 confident or not too confident?

23 A. Let's say moderately confident.

24 Q. We're almost done. I would like you to refer to
25 figures, the figures that deal with hydraulic conductivity

1 and the model domain from 4.1-9 and forward.

2 A. Yes.

3 Q. My first question is that high conductivity zone
4 15 at the north, at the northern edge of Whistler Mountain
5 where you have conductivity in the first four layers of 45
6 feet per day, and I was wondering what is the basis for that?

7 A. Well, that was representing a concept, which
8 early on in the process we had hypothesized that if there was
9 any fault related weaknesses through the Whistler Range,
10 other than what we've already examined around Devil's Gate,
11 where might those be.

12 And what we did is projected fault structures on
13 the north end of Lone Mountain up toward the Whistler
14 Mountain. In the area of that zone 15 there's a saddle
15 there. And so it was our hypothesis that if there are some
16 fault-related conduits through the predominantly vinini
17 clastic rocks at that depth, that might be a location to
18 represent those. So I wanted to accommodate that
19 possibility. We to date don't have any evidence on the
20 ground that that actually exists.

21 Q. Okay. On Figure 4.1-13 and 14 and 15 and 16, you
22 have that conductivity zone 80 that runs along the projection
23 of the northern Nevada riff?

24 A. Yes.

25 Q. Do you have any data south of the Roberts

1 Mountains to support those low conductivity volumes ?

2 A. We have data to support the presence of those
3 dikes at depth along that edge of the Roberts -- excuse me --
4 that edge of Kobeh Valley. And specifically that would be
5 the regional magnetic data which was presented, I believe, as
6 Figure 9 in Exhibit 40.

7 Q. I recall it.

8 A. Okay.

9 Q. Has there been any actually physical testing to
10 ensure that or to see if those dikes actually are present all
11 the way to the top of bedrock?

12 A. No, no. And this is -- We're trying to represent
13 the concept in the model that I do believe exists. But in
14 fact, the real classic example is in the Roberts Mountains
15 zone 61 is the classic outcropping of those dikes cited
16 throughout the literature. There's also an outcropping of
17 those dikes for the two north and Cortez Range. And there's
18 a showing I believe on Figure 8 of Exhibit 40 also. Those
19 are really referenced in the literature as being classic
20 surface exposures of those dikes.

21 Q. Are there any major dikes exposed at all in the
22 carbonates in Lone Mountain or to the south?

23 A. Not to my knowledge. Although Tim, Bush and
24 Plume in 2006 I believe referenced some possible occurrence
25 in Fish Springs Range. I have not observed those personally.

1 Q. In your model you have extremely low hydraulic
2 properties for the Whistler Mountain along its entire length.
3 Are there any data, physical data, to support those very low
4 hydraulic conductivity estimates?

5 A. Well, only our interpretation of the geology and
6 subsurface, which we interpret to be at least for the upper
7 two to 3,000 feet vinini clastic rocks which I have observed
8 if the field. There's shells and court side clastic rocks,
9 you would expect hydraulically quite tight. And I have also
10 observed granite at Whistler Mountain. And again, these are
11 all subsurface interpretations.

12 I would say that we have drilled up in the Sofa
13 Spring Range a few test wells. They are reported in Exhibit
14 40. We were trying to get some traction zones to see if we
15 could develop some modest amount of water supply, which we
16 failed. We did not encounter any high flow properties.

17 And I do believe we also measured hydraulic
18 properties from those wells. I think there are two -- I
19 believe there are two wells that we drilled in that range.

20 Q. So is it true then that these, the really low
21 hydraulic conductivities in the model both along the northern
22 Nevada riff zone and in the Whistler Range and below the
23 Whistler Range, they -- those low hydraulic properties
24 prevent the progression of the drawdown cone from Kobeh
25 Valley to Diamond Valley?

1 A. Yes. Although another big factor is the salt
2 ridge as we've referred to it, and that is the same matrix
3 dike material or the flow material we believe. That we have
4 drilled and also tested with pumping to be hydraulically --
5 or I should say not pumping test but falling head test if I
6 recall in the vasault material and also found to be
7 hydraulically tight. Actually that vasault directed to the
8 east of the central and northern part of the well field has a
9 very significant effect on the curtailment of the drawdown
10 towards the east.

11 Q. If I recall you had a horizontal flow barrier in
12 that vicinity between the pumping center and well, I guess it
13 was the northeast horizontal flow barrier in the previous
14 model?

15 A. Yes.

16 Q. What happened to it in this model?

17 A. It is a fault that we mapped. There was a subtle
18 water level difference on either side. But the final
19 calibrated value on that fault ended up with a conductance
20 that was very similar to the hydraulic properties of the
21 materials the fault was in. So I concluded that it was not
22 improving the fit of the data to have that fault in there and
23 I removed it.

24 MR. FELLING: Thanks. No more questions.

25 HEARING OFFICER WILSON: Any other questions of

1 staff?

2 THE STATE ENGINEER: I don't have any.

3 HEARING OFFICER WILSON: All right. Thank you,
4 Mr. Smith. You can step down.

5 Mr. De Lipkau, I believe we talked about Exhibit
6 39 which has not been admitted yet, which is the volumes one
7 and two of the model.

8 MR. DE LIPKAU: And we'd like to move for the
9 admission of Exhibit 39.

10 HEARING OFFICER WILSON: Any objections to the
11 admission of Exhibit 39?

12 MS. PETERSON: No objection.

13 MS. URE: No objection.

14 HEARING OFFICER WILSON: Thank you. Exhibit 39
15 will be admitted.

16 You also spoke about Exhibit 408.

17 MR. DE LIPKAU: I'd like that admitted.

18 HEARING OFFICER WILSON: Is there any objection
19 to Exhibit 408?

20 MS. PETERSON: No objection.

21 MS. URE: None.

22 HEARING OFFICER WILSON: Exhibit 408 will be
23 admitted.

24 MR. DE LIPKAU: I would also like to move for the
25 admission of 406, which was discussed as Ruling 4848.

1 HEARING OFFICER WILSON: Any objection?

2 MS. PETERSON: No objection.

3 MS. URE: No objection.

4 HEARING OFFICER WILSON: Okay. Exhibit 406 will
5 be admitted. I have that as everything, Mr. De Lipkau,
6 unless you have something else on your list.

7 MR. DE LIPKAU: No, sir. That's it.

8 HEARING OFFICER WILSON: Okay. Am I correct was
9 that the last witness?

10 MR. DE LIPKAU: Yes.

11 HEARING OFFICER WILSON: On direct?

12 MR. DE LIPKAU: Yes, on direct.

13 HEARING OFFICER WILSON: It's about ten to five,
14 probably too soon to start anything new.

15 MR. HICKENBOTTOM: Too late.

16 HEARING OFFICER WILSON: I do have to mention
17 that we need everything, all your personal items out of the
18 room. The people that were doing the lighting out in the
19 hall, they will be doing this room in the morning and then
20 there is also a hearing in here from another agency. So we
21 can't leave any of our personal items here. We have to take
22 everything out, bring it back on Thursday. And I'd like to
23 get started Thursday at 8:30 a.m.

24 MS. PETERSON: I think that's a good idea.

25 HEARING OFFICER WILSON: All right. With that

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we'll be off the record.

(Hearing concluded at 4:48 p.m.)

CERTIFICATE OF SERVICE

Pursuant to NRAP Rule 25(1)(c), I hereby certify that I am an employee of ALLISON, MacKENZIE, PAVLAKIS, WRIGHT & FAGAN, LTD., Attorneys at Law, and that on this date, I caused a CD-ROM version of same to be served to all parties to this action by:

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DATED this 21st day of December, 2012.

/s/ Nancy Fontenot

1 I would like to -- There is one item that did
2 come to light in our examination of the data and I'll point
3 to Figure 4.1-43. This is a possible explanation for a
4 portion of the apparent leveling of water levels during that
5 time frame. We don't think it's a full explanation but --

6 Q. Mr. Smith, when you say water levels, are you
7 speaking about Diamond Valley now?

8 A. That's right. The water level that we're trying
9 to calibrate to historic water levels that have been
10 declining over time in Diamond Valley.

11 Q. Caused by Diamond Valley pumping?

12 A. That's correct, that's correct, historically. So
13 Figure 4.1-43 is a plot of water level elevation on the Y
14 over time showing our calibration period. You will note that
15 the yellow measurements are summer and fall measurements
16 taken during agricultural pumping. And the blue measurements
17 are measurements made in the spring time essentially prior to
18 agricultural pumping. So if you look at each of these
19 hydrographs you will see that there is, we have measurements
20 in the same year, spring versus fall, there is a level of
21 decline of water levels due to localized agricultural pumping
22 during that year. We don't have a lot of data to compare
23 with, but you will note that all of our measurements from the
24 mid-90s forward are spring time measurement whereas prior to
25 that they were a mix of fall and spring measurements. So

1 that could be, indeed, part of the reason there is an
2 apparent shift in the data. It could be just because we're
3 now consistently measuring spring rather than fall or summer
4 time measurements. But again, we don't think that's the full
5 explanation.

6 HEARING OFFICER WILSON: Mr. Smith, before you go
7 further, Mr. De Lipkau, how much more do you have on direct?

8 MR. DE LIPKAU: What do you think? Half an hour?

9 THE WITNESS: Probably.

10 MR. DE LIPKAU: Half an hour.

11 HEARING OFFICER WILSON: Okay. Let's take a
12 break here. We've been going about an hour and a half. I
13 don't want to go too much further. Let's be back at 11:10.

14 (Recess was taken)

15 HEARING OFFICER WILSON: Continue with
16 Mr. Smith's direct testimony.

17 Q. (By Mr. de Lipkau) Mr. Smith, before the break I
18 believe you were discussing Figure 4.1-43.

19 A. That's correct.

20 Q. Would you -- Have you completed your discussion
21 on that figure?

22 A. Yes.

23 Q. Would you please move on then.

24 A. Well, that really concludes my summary of
25 changes, major changes between the 2008 and 2010 models.

1 Q. All right. So is it a true statement that your
2 prior testimony included the difference between the 2008
3 model introduced here and the 2010 model set forth as Exhibit
4 39?

5 A. Yes.

6 Q. And you have further discussed, I believe, the
7 input items in to the 2010 model; is that correct?

8 A. That's correct.

9 Q. All right. So have you run the model?

10 A. That's correct.

11 Q. Approximately how many times have you run the
12 model?

13 A. This model I have run well over a thousand times.
14 It sounds like a lot, but it is definitely factually
15 accurate. It's been through many iterations of automated
16 calibration where I will load perhaps a dozen or two dozen
17 different permeatations of variables and run them through the
18 model to try and identify the calibration parameters. That
19 has been done many, many, many times, so well over a thousand
20 times.

21 Q. Okay. You discussed earlier the phrase or
22 expression "flooded cells."

23 A. Yes.

24 Q. Do we have flooded cells in the model?

25 A. There are a few cells in layer one where that

1 condition exists.

2 Q. All right. Are the number of flooded cells in
3 your opinion within acceptable modeling standards?

4 A. Yes.

5 Q. What format did you use to run the model?

6 A. The model code is MODFLOW and the particular
7 version of MODFLOW is SURFACT.

8 Q. Is MODFLOW SURFACT proprietary?

9 A. That version of MODFLOW is proprietary.

10 Q. Can it be acquired?

11 A. Yes, yes, it can.

12 Q. And did you in fact acquire MODFLOW SURFACT for
13 the purpose of running the model?

14 A. Yes, I did.

15 Q. Okay. How does one actually run the model?
16 Would you please describe.

17 A. Well, I've given an overview of building the
18 model and calibrating the model which includes calibrating
19 the period running the model up to close to current
20 conditions. So now if we wanted to use the model to do
21 predictive runs for running that model, continuing that model
22 run forward in time in what we call transient model scenarios
23 or predictive scenarios.

24 Q. What does transient mean?

25 A. Transient is time dependent.

1 Q. Okay.

2 A. So we have done so. That's the purpose of this
3 model is to try to project in to the future what the impacts
4 of pumping, or maybe not impacts, I should say what the
5 future drawdown will be as a result of pumping.

6 Q. Let me stop you right there. Is a numerical
7 model then as you just described one of several means of
8 determining the impact caused by pumping?

9 A. The model provides us a tool from which we can
10 assess drawdown. Drawdown we can associate with a potential
11 impact.

12 Q. Over distance and over time?

13 A. That's correct. How the results of the forward
14 simulations are presented is significantly different in the
15 2010 version of the model report versus what was presented in
16 2008. There is --

17 Q. Let's discuss the impacts as set forth by the
18 model as you've previously testified. Are you prepared to do
19 that?

20 A. The drawdown?

21 Q. Yes.

22 A. Predicted drawdown?

23 Q. Right.

24 A. Yes. So the drawdown is predicted in several
25 different scenarios. The first scenario which is documented

1 is a scenario of predicted drawdown for current conditions,
2 current being year 2009 for this study.

3 Q. And what exhibit or figure is that?

4 A. And there are results of predicted drawdown are
5 shown in Figure 4.4-4. So in this figure the colored areas
6 represent predicted drawdown on a gray shaded relief
7 topographic map. There are two colored areas. The most
8 prominent is Diamond Valley. It's predicting levels of
9 drawdown under current conditions due to the historic pumping
10 in Diamond Valley.

11 The other colored area is in southwestern Kobeh
12 Valley in the vicinity of Bobcat Ranch. Bobcat Ranch has
13 also had historic pumping for agriculture since the
14 mid-1960s.

15 Under this scenario I'd like to refer to Table
16 4.4-4. There will be a series of tables that I will refer to
17 that are a summary of the flows between basins, flows being
18 discharged by evapotranspiration out of the different basins
19 and accounting basically of the major flows in the model
20 area. The model area, I should mention, includes all of
21 Kobeh Valley, Diamond Valley, Antelope Valley and the south
22 central portion of Pine Valley.

23 So under current conditions is a column that's
24 numbered two. And you'll see that contrast with the
25 pre-development or steady state predicted flows in column

1 one. And possibly of most interest to the state would be row
2 two, which is the predicted flow subsurface flow from Kobeh
3 Valley to Diamond Valley.

4 And column one under steady state calibration
5 it's predicted at 1,583 acre-feet annually. This is, I
6 believe, around 200 acre-feet a year, greater than the
7 previous steady state calibrated model.

8 Q. When you say previous that would be 2008?

9 A. From 2008. Under current conditions you'll note
10 that that predicted interbasin flow is increased to 2,001
11 acre-feet. That is solely due to a steep in the gradient
12 between Kobeh Valley and Diamond Valley.

13 The interbasin flow that's simulated in the model
14 occurs geographically in a couple different areas. One area
15 is down near Devil's Gate. And I'd like to find the table so
16 I can get some exact numbers for the record.

17 Table 4.1-13 is an accounting of the interbasin
18 flows including a breakdown of the flow components predicted
19 by the model between Kobeh Valley and Diamond Valley. So the
20 predicted shallow flow to Devil's Gate that's through the
21 alluvium, the alluvial thickness is approximately a hundred
22 feet in Devil's Gate and that's predicted at 34 acre-feet
23 annually. That's very close to the Reconnaissance value that
24 was estimated at or below 40 acre-feet annually. We've also
25 in the model have a representation of potential conduit

1 through Devil's Gate through the underlying carbonate rocks.
2 And that flow is simulated at 156 acre-feet annually. So the
3 combined total is 190 acre-feet annually through Devil's
4 Gate.

5 The remainder of the flow is occurring both deep
6 in the model and north of Whistler Mountain. The model
7 geology that's represented between the two basins at depth,
8 and this is several thousand feet, probably below 3,000 feet
9 of depth and deeper is simulated to be carbonate rocks of
10 moderate permeability and that provides a hydraulic
11 connection between the basins that simulate in the model.

12 Q. Is it a true statement then that the model
13 predicts a flow of groundwater from Kobeh to Diamond Valley?

14 A. That's correct.

15 So the next model, transient model simulation
16 that we run, and this was structured in the format as
17 requested by the BLM and their third party consultant is a no
18 action alternative. So this scenario is run from current
19 conditions, which was year 2009, forward in time for the
20 predicted mine life of 44 years. So it runs through calendar
21 year 2055.

22 What this shows, looking at Figure 4.4-6, is
23 continued drawdown in Diamond Valley. That's because we have
24 assumed that the agricultural pumping and consumption of
25 groundwater by agriculture remains the same as current

1 conditions throughout the mine life. So it remains the same.
2 And that is approximately 55,000 acre-feet annually of
3 consumption of groundwater.

4 Q. Excuse me, Mr. Smith. No action means no pumping
5 by the mine?

6 A. No action by the mine.

7 Q. But continued pumping at the Bobcat Ranch?

8 A. That's right. We have also included continued
9 pumping at both the 3 F Ranch and the Bobcat Ranch. These
10 pumping centers were added in this part due to the pending
11 applications with the state to continue agriculture and
12 pumping out those ranches.

13 So approximately we're predicting another hundred
14 feet of drawdown in Diamond Valley to occur over that time
15 span of approximately 45 years.

16 Q. Does that mean a hundred feet from where the
17 water level is now?

18 A. From current conditions. Figure 4.4-9 provides
19 yet another scenario that we've run. It is called cumulative
20 action scenario. This is a model scenario where we add to
21 the no action alternative the proposed mine pumping for the
22 duration of the project.

23 And at this time I should refer to Figure 1.1-2.
24 This is a map that shows the layout of the proposed Kobeh
25 Valley central well field. The blue points on this map are

1 the proposed production wells. These correspond to the ten
2 pending applications, ten points of diversion that are
3 defined by the change applications filed in June of this
4 year.

5 Q. Am I correct in stating that the point of
6 diversion as set forth on Figure 1.1-2 were inserted in to
7 the model and result in the figures set forth on 4.4-9?

8 A. That's correct. Our simulated pumping at those
9 points of diversion results in the predicted drawdown.

10 Q. And does Figure 4.4-9 include the continued
11 55,000 gallons per -- acre-feet per year in Diamond Valley
12 over the same period of time, being 44, 45 years?

13 A. That's correct. It includes continued
14 groundwater consumption at approximately 55,000 acre-feet
15 annually in Diamond Valley.

16 Q. Thank you.

17 A. One quick note on Figure 11-2. There are two
18 blue dots on the right-hand side of the map. They are, they
19 straddle what's labeled as U'Ans-Eame Creek. It's spelled U
20 apostrophe a-n-s dash e-a-m-e creek. And those two points
21 represent construction water supply wells that have also been
22 simulated in the model.

23 Q. And how long will those construction wells
24 operate?

25 A. It's predicted that they were run over an

1 18-month time frame. The model stress periods or time steps
2 if you want to call them that are annual. So what we did is
3 calculate the total volume of water over the 18-month period
4 and then input that as a total pumped over the 12 months for
5 the one-year stress period on the model. But there is that
6 construction water source occurs in the year prior to
7 production from the well fill. But for accuracy we wanted to
8 include that short term stress in the model.

9 So just briefly to convey the simulation results
10 shown in Figure 4.4-9, drawdown in the well field is
11 contoured at ten-foot intervals. The maximum is a 110 foot
12 contour. The -- This has been discussed already in the
13 testimony of Mr. Rogers. But we report out the results in
14 all cases at a ten-foot threshold.

15 In Diamond Valley we have a cumulative drawdown
16 in time which is predicted to be -- this figure is at year
17 44, the last year at the end of the proposed mine life. And
18 drawdown, cumulative drawdown in Diamond Valley is predicted
19 to have exceeded 200 feet by that time and predicted
20 cumulative drawdown in the Bobcat Ranch area is about 40
21 feet.

22 Q. Mr. Smith, you mentioned ten-foot drawdown. Why
23 did we use -- Why did you use ten feet?

24 A. Well, first and foremost that's what was
25 requested from us by the BLM. And the model is a tool. It's

1 not any type of exact calculator for drawdown. It's meant to
2 be used as a tool for us to approximate potential drawdown on
3 a regional basis to the regional flow system. So whether you
4 choose to want to view the threshold of drawdown at five feet
5 or ten feet, 20 feet, whatever you choose to want to view
6 those results, it still can only be used as a tool to help
7 you understand potentially what is the extent of the degree
8 of drawdown. It is not a definitive tool that is going to
9 say that you're going to have 5.4 feet of drawdown at point X
10 and Y. It's not developed and intended to be used in that
11 way.

12 The next set of figures starting with Figure
13 4.4-12 conveys the predicted drawdown for the proposed action
14 alternative. This has been developed in a more robust manner
15 as compared with the 2008 model. It is not a stand-alone
16 model scenario. Rather it is the subtraction of the output
17 results. So we subtract from the cumulative action the no
18 action model results and what is derived out of that is a
19 clean picture of exactly what are the predicted drawdown
20 results for the proposed action on the mine? The mine is all
21 the outside influences that commingle and produce the
22 regional drawdown in the cumulative action.

23 So Figure 4.4-12 is taking us at snapshots in
24 time year 2020 to approximately nine years in to mining and
25 pumping. Pumping rate, I should mention is 11,300 acre-feet

1 annually for the duration of pit dewatering that amount is
2 reduced by the amount of dewatering water that would be
3 generated a portion to meet that demand. It is at most, I
4 believe, seven percent of the total water supply at the peak
5 estimated time for dewatering.

6 After dewatering ceases after year 32 then the
7 entire 11,300 acre-feet is derived from the oil field for the
8 proposed life.

9 You can see in comparison on the right-hand side
10 is Figure 4.4-12 is year 2030, 19 years forward in time. And
11 you can see how the model predicts the growth and expansion
12 of predicted drawdown.

13 The next figure, Figure 4.4-13 is taking us again
14 forward in time to the year 2040 on the left and then the
15 final year of pumping for the Mount Hope project is
16 represented at year 2055. And that shows the growth and
17 expansion over time of the predicted drawdown.

18 So as one would expect, this is an evolving cone
19 of depression. It's a dynamic condition. But I think it
20 also helps us understand and we want to use the model result
21 and the prediction to help us build a monitoring plan. This
22 is giving us some guidance as to what to expect at different
23 time shots, snapshots in time. And of course I would think
24 that you would be interested in wanting to document response
25 from well field pumping early in time and then also have

1 sufficient monitoring to offer safeguards and a better
2 understanding for the long term effects of drawdown.

3 Q. Mr. Smith, in your opinion how frequently should
4 this model, Exhibit 39, be updated or improved upon?

5 A. Well, I definitely advocate doing audits fairly
6 frequently. That doesn't mean that you're going to
7 necessarily modify or update the model. But it is simply
8 looking at the observed conditions and measurements in the
9 field over time, comparing those with the model and passing
10 some judgment. Is the model sufficiently predicting the
11 observation, then that's great. Then there isn't any update
12 really needed. You know, if we get to a point where you do
13 an audit and you feel like there's areas that could be
14 improved then you can take that up too.

15 Q. Would the model plus updates be useful in a
16 monitoring program?

17 A. Yes. And it is being required by the BLM as part
18 of their monitoring plan. They want the tool to stay active
19 and up to date so that they could also as the project
20 progresses in time they have a tool to be able to project out
21 potential levels of drawdown and again from those levels of
22 drawdown make inference about potential impacts to the
23 sources.

24 Q. Basically to keep the model up to date, is that a
25 correct expression?

1 A. Yes. Table 4.4-2 summarizes the pumping
2 distribution in the well field. This does not include the
3 short term construction supply water. These rates are held
4 continuous throughout the duration of the mine project with
5 the exception of the minor offsets due to dewatering water
6 supply.

7 They are based at -- Five of the ten locations
8 that are now the proposed points of diversion, we have test
9 wells, five of which we do not at this time. And we feel
10 like we've put together a distribution of pumping that both,
11 one, is conservative, in regards to our understanding where
12 we've tested the aquifer, and further conservative where we
13 have yet to drill test wells.

14 Q. Mr. Smith, could you tell us the approximate
15 percent or volume that will be taken from the carbonate wells
16 and from the alluvial wells?

17 A. Yes. What we call our base case pumping scenario
18 derives five percent for a continuous flow rate of 350
19 gallons a minute from our test Well 206 in carbonate rock.

20 Q. I'm going to stop you right there. Are you
21 saying that you intend to pump Well 206 at the approximate
22 rate of 350 gallons a minute?

23 A. We would like for the mine to have the
24 opportunity to pump this well to a limited degree.
25 Operationally we would envision that Well 206 could easily be

1 a production well that could generate three or 4,000 gallons
2 a minute without any problem. The transmissivities are quite
3 high.

4 The problem, as Mr. Childress explained, is in a
5 compartmentalized block of carbonate aquifer. So we can't
6 sustain those flow rates over the long term. But if you're
7 thinking about operating a well fill it's really great to
8 have a well like that in your arsenal of wells. Because if you
9 have to take a couple wells off line for maintenance or
10 whatever reason, you have a back-up water source there that
11 can easily offset production from two, three wells. So we
12 could have easily developed a model scenario where we just
13 struck all the carbonated pumping. But we don't feel like
14 it's warranted to be that extreme at this point. We have
15 certainly reduced that dependence on that source a lot. But
16 that's our base case is leaving five percent of the total
17 well fill supply which equates to 7,000 GPM is the total at
18 206 and also where we encountered deep carbonate rocks at
19 location 220.

20 And Mr. Childress and Mr. Felling were referring
21 to that location, that carbonate rock material was
22 encountered at 960 feet in depth in that test hole and based
23 on pumping tests we feel that that also can be a reasonable
24 supply of water. But by no means is the mine water source
25 dependent on the carbonate rock aquifer at this point. 90

1 percent in our base case is proposed from alluvial basin.

2 Q. Mr. Smith, does Exhibit 39 depict or attempt to
3 estimate the volume of phreatophyte capture?

4 A. Yes. Since we have been briefly over the
5 different scenarios, if we can refer to Table 4.4-7, which is
6 a summary of the same major water parameters reported in the
7 other tables I've referenced. If you refer to column that's
8 numbered three for the proposed action alternative, that
9 shows the difference in ET between the no action scenario and
10 the proposed action. And we show that the predicted decrease
11 in the evapotranspiration in Kobeh Valley is 4,015 acre-feet
12 annually at mine year 44. So there is a progressive capture
13 of phreatophyte ET as the drawdown and pumping progresses at
14 the well field.

15 Q. So on year one the phreatophyte capture is
16 virtually zero and then at year 44 the phreatophyte capture
17 is slightly over 4,000 acre-feet annually; is that correct?

18 A. That's correct.

19 Q. And then as the mine shuts down and the cone of
20 depression decreases, phreatophyte capture would be
21 decreased?

22 A. It starts to recover. The total volume starts to
23 recover. However, we recall that we still maintain pumping
24 at Bobcat Ranch and 3 F in our scenarios. So it does not
25 recover the current conditions but reaches an equilibrium of

1 pumping in Bobcat and 3 F.

2 The consumptive water use is approximately 3,500,
3 I believe, for those two ranches in our model scenario. So
4 ET re-equilibrates at approximately 3500 acre-feet less than
5 current conditions. And that is a lot of predicted
6 evapotranspiration in Kobeh Valley is shown in Figure 4.4-18.

7 Also of note is the second row on Table 4.4-7.
8 It's the predicted groundwater outflow from Kobeh Valley to
9 Diamond Valley. And you will notice that in column three
10 it's actually a positive number, positive 15. So by
11 implementing the project we have increased the subsurface
12 flow from Kobeh Valley to Diamond Valley by 15 acre-feet.
13 That's as a net. I need to explain that number a little bit.

14 What is happening in the regional model is
15 there's a, the pit is also populating at the boundary
16 between two basins. So over time what the model simulates is
17 approximately 40 acre-feet of Kobeh Valley water coming in to
18 the pit. So it crosses, it physically crosses that line that
19 we've drawn as being Kobeh and Diamond Valley basin. So you
20 have 40 feet that's induced in by the pit.

21 Now, counteracting that not fully is the slight
22 reduction in the underflow, subsurface flow between the
23 basins. And that amount is simulated to be reduced by 25
24 acre-feet by mine year 44 as compared with no action. So you
25 add -- subtract the two. So you have 40 coming in minus 25

1 capture still leaves you with a net positive increase of 15
2 acre-feet. And that's explained in the text if you catch the
3 right sense.

4 Q. Mr. Smith, in running the model, Exhibit 39, did
5 you determine or calculate a volume that would be captured
6 over time of groundwater that otherwise would flow or might
7 flow from Kobe to Diamond?

8 A. As an estimate of the cumulative amount of
9 capture through the entire mine life is approximately 550
10 acre-feet. That's a cumulative amount of flow every year
11 added up for the entire 44-year mine life.

12 Q. All right. Let's start with the X and Y axis.
13 The X axis is 44 years, is it not?

14 A. Correct.

15 Q. And at the end of 44 years are you saying the
16 amount of capture would be approximately 25 feet?

17 A. 25 acre-feet.

18 Q. And that's on the Y axis?

19 A. That's correct.

20 Q. And is the progression lineal?

21 A. It's approximately linear. That's a reasonable
22 assumption.

23 Q. So the total volume then of water captured as
24 depicted in the model over the 44-year life of the mine would
25 be 550 acre-feet; is that correct?

1 A. That's correct.

2 Q. And you are aware that KVR or Eureka Moly owns
3 many times more acre-feet than 550?

4 A. That's correct. And the duties of course on an
5 annual basis, not a cumulative total.

6 Q. All right. So let's summarize where we are then
7 on operation of the well field and the effect thereon as
8 determined by Exhibit 39 on Diamond Valley.

9 A. Based on the model there is no measurable
10 drawdown occurring in Diamond Valley as a result of pumping
11 in Kobeh Valley by the mine.

12 Q. All right. Now I'm going to ask you the same
13 question. What is the effect of the pumping as set forth in
14 Exhibit 39 on Roberts Mountain, the south side?

15 A. I'd like to refer to Figure 4.4-15. Another
16 aspect of reporting that has changed is not only are we
17 reporting the extent of drawdown again reported at a ten-foot
18 threshold at mine year 44 but we also have examined that in
19 the post-mining condition. So in the Roberts Mountains area,
20 southern Roberts Mountains, the model does predict an
21 encroachment at the ten-foot threshold up in to the Roberts
22 Mountains and it does predict that at approximately mine
23 year, post mine year 30 that maximum extent is realized after
24 which there's a contraction of the projected extended
25 drawdown.

1 The degree of drawdown is visually shown in
2 Figure 4.4-13 for mine year 44. So this also, this picture
3 of predicted drawdown looks different than the model that was
4 used in 2008. The encroachment, predicted encroachment of
5 drawdown in to the Roberts Mountains was much greater than
6 the previous version of the model.

7 There are several reasons why it's not as
8 extensive in this version. One of them is the fault barrier
9 that we've now had represented in the model. We've
10 calibrated that conductivity to water levels and our
11 transient pumping tests. Another reason is there's less
12 stress on the carbonate aquifer in the proposed base case
13 scenario. It's reduced from I believe what was a 25 percent
14 carbonate, 75 percent alluvial scenario in 2008. And then
15 also the geologic structure of confinements that now that we
16 have simulated vinini formation underlying the alluvium for
17 the central and northern part of the well field. All of
18 these changes to the model have a cumulative result, resulted
19 in less predicted drawdown to the Roberts Mountains.

20 Q. In your opinion then would the pumping as
21 contemplated as derived by the model adversely affect the
22 surface sources on Roberts Mountain?

23 A. My opinion is that I don't believe those sources
24 are going to be impacted. But I'm not deriving that solely
25 from the model. The model is giving us a prediction of

1 potential drawdown up in to the Roberts Mountains.

2 I think we hopefully all understand that there's
3 a lot of simplification that's involved with building a model
4 like this on a regional scale.

5 But the other variable that needs to be
6 considered is what are the sources of flow to Roberts Creek,
7 where geographically are they being derived, from what
8 sources. So we understand that there's the snow melt and the
9 runoff. We don't believe there's any predicted impact from
10 groundwater pumping to the seasonal runoff, surface sources.

11 Q. And why is that?

12 A. It's purely dependant on precipitation, snow
13 pack, climatic conditions, all of which generate runoff
14 coming through the system. It's not dependent in any degree
15 on groundwater, especially on regional groundwater flow.

16 Q. And what's the difference in elevations between
17 the pumping water level and the top of Roberts Mountain
18 approximately?

19 A. Well, the top of Roberts Mountain is over 10,000
20 feet in elevation and the well field is approximately 61 or
21 62. So there's close to 4,000 feet of total elevation
22 difference.

23 Now, the other component of this that we need to
24 be very aware is the base flow which is spring supporting.
25 That has some type of groundwater connection. Now, and

1 Mr. Katzer testified to conditions on Roberts Creek. But
2 what we observed is the base flow in Roberts Creek is not
3 derived from lower in that groundwater flow system. It's
4 designed from quite high up in the mountain block system.
5 And the mine has been doing based on monitoring and it
6 continues to do so on several of those spring sources that
7 are higher up in the mountain block.

8 So for groundwater pumping in the well field to
9 actually affect base flow in Roberts Creek, that means
10 drawdown is going to have to propagate from the well field up
11 fairly high in elevation in to the Roberts Mountain block.
12 And I think, number one, I think that the likelihood of that
13 happening is remote. We don't have the tools, nobody has the
14 ability to say anything absolutely in that regard. But I
15 think it's remote.

16 And I also believe firmly that it can be
17 carefully monitored over time. And already the mine has five
18 wells on the carbonate aquifer and further along the
19 structures that we understand possibly to be connected there
20 are five existing monitoring wells to the north of Well 206
21 already collecting baseline data. The mine has in my mind
22 been doing an exemplary job in getting out on the ground and
23 collecting data and expending data to get a monitoring
24 network in the ground.

25 There's still monitoring plans that have to be

1 approved by the two different agencies and this can be
2 carefully considered and reviewed.

3 But in the event that there is actual observed
4 drawdown happening that's encroaching at rates or degrees
5 that we're uncomfortable with, that the state is
6 uncomfortable with, certainly there can be mitigation
7 measures taken, many of which could include shifting, pumping
8 around the well field as an easy example.

9 Q. Mr. Smith, I'm going to ask you the same question
10 on what does the model predict regarding the effect if any
11 upon the surface sources on the north side of Roberts
12 Mountain being within the Pine Creek range?

13 A. For clarification are we talking about Pete
14 Hanson?

15 Q. Pete Hanson Creek dam and the various
16 tributaries.

17 A. Well, the numeric flow model if you want to
18 scrutinize it has a very small threshold of drawdown.
19 Effectively it's predicting drawdown over the entire model.
20 There's a certain point where we will continue to extrapolate
21 out very minor drawdown, but that's just the nature of the
22 numeric flow model. The drawdown in Pete Hanson Creek is
23 very small. The drawdown is very small. I don't know the
24 exact number but it's well below our ten-foot threshold that
25 we have in the results. So I don't think there's any real

1 possibility affecting that water shed.

2 MR. DE LIPKAU: Mr. Hearing Officer, I think
3 we're at a good point to stop right now if that is your
4 pleasure.

5 HEARING OFFICER WILSON: Do you have more on
6 direct?

7 MR. DE LIPKAU: Yes.

8 HEARING OFFICER WILSON: Let's stop until --
9 Let's go until 1:15.

10 (Lunch recess was taken)

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TUESDAY, DECEMBER 7, 2010, 1:15 P.M.

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HEARING OFFICER WILSON: We're continuing with the direct examination of Dwight Smith. Go ahead.

MR. DE LIPKAU: Thank you.

Q. (By Mr. de Lipkau) Mr. Smith, you're of course still under oath. Could you please explain in Exhibit 39 in a little more detail the north, south shift in well field pumping within Kobeh Valley.

A. Yes.

Q. Refer to the exhibit please.

A. On Figure 4.4-21 there are two modifications from the base case pumping distribution that we tested to help put some bounds on the potential pumping distribution and they didn't predict a drawdown. The north and south shift pumping distributions are summarized in Table 4.4-11.

So basically what we've done in these two scenarios is we've either skewed the shift, the pumping distribution towards the north in the well field towards Well 206 or shifted that pumping and weighed a little more heavily to the south. The production wells have not been drilled for this project.

Q. Excuse me. The wells what?

A. The production wells, we have test wells at five of the ten locations. So we wanted to also present a little

1 bit of latitude as far as we don't have an exact pumping
2 distribution. We won't know that until production wells are
3 drilled and tested. So this is meant to capture in bracket
4 some of that uncertainty as to how much actually might be
5 pumped for each individual point.

6 And then the next table, Table 4.4-12, is an
7 overview of the effects to the water budget as a result of
8 those different shifts.

9 Q. Are you finished describing that?

10 A. I think that's it.

11 Q. Earlier you were asked some questions about the
12 effect of pumping upon the north side of Roberts Mountain,
13 were you not?

14 A. Correct.

15 Q. All right. I would like to hone in or center on
16 Henderson Creek. Would you please describe the effect of
17 pumping if any upon Henderson Creek.

18 A. Well, first off, it's my opinion that it is
19 unlikely that we're going to have detrimental impacts to the
20 flows of Henderson Creek as a result of pumping for the Mount
21 Hope project.

22 Q. Please explain why.

23 A. I'd like to refer to Figure 4.4-16. The
24 simulated drawdown that occurs in the Henderson Creek water
25 shed is a result of the pit dewatering and subsequent

1 formation of the Pit Lake. And in Figure 4.4-16 we try to
2 capture how that cone of influence expands out over time. So
3 it's, as is detailed in the report, perhaps not well
4 described yet, but the hydraulic conditions are hydraulically
5 very tight at Mount Hope. The ore value itself is the result
6 of an intrusive indigenous body. It's intruded up in to many
7 clastic rocks. So it's hydraulically tight. And I think
8 that's understood by when conveyed the levels of dewatering
9 that are anticipated out in this project.

10 Q. Could you speak up a little bit.

11 MS. JOSEPH-TAYLOR: By tight you mean water
12 doesn't move through easily?

13 THE WITNESS: Hydraulically tight. Water will
14 not flow easily through these rock types. So there is a cone
15 of influence or of drawdown in the original water table
16 that's predicted around the pit by the regional flow model.
17 However, while there is predicted drawdown, we need to be
18 very careful and qualify that that does not -- I'm not saying
19 because there is predicted drawdown that there is an absolute
20 impact that we have defined in this modeling exercise. The
21 model is not meant to be utilized in that manner.

22 If you want to start looking in to more detail
23 and specifics of say a particular spring that's within the
24 defined, the simulated drawdown area, you need to start --
25 and consider could this spring be impacted, it really becomes

1 a very site specific condition and there's going to be
2 concern. The model is what we have to predict the drawdown
3 but there's a lot more that goes in to it.

4 And I guess I would like to point to Figure
5 4.4-20 and I'll point out a few examples. And I believe for
6 reference also it would be convenient to have plate two. So
7 on Figure 4.4-20 which shows the extent of the predicted
8 water level, regional water level drawdown at a ten-foot
9 threshold you'll make note that to the north of Mount Hope
10 you'll see six blue circles. They are labeled for the spring
11 ID numbers. 580, 583, 592 and then a closely grouped set of
12 spring sites with ID numbers 606, 609 and 610. And those
13 also show up on the plate two which is a spring inventory map
14 that we've compiled for the study area including some
15 multiple sources of information from the USGS springs that
16 are designated on topo maps and other spring sources
17 including Mount Hope spring inventory which is quite
18 extensive.

19 So what is not conveyed very well with this type
20 of scale is I'll take the example of 592 first. It appears
21 to be plotting very near to the south fork of Henderson
22 Creek.

23 Q. Excuse me, Mr. Smith. What is the approximate
24 elevation of the subject spring, 519 -- 592?

25 A. It's difficult for me to read the elevation. I'm

1 not for sure. Probably 65 --

2 Q. Let me ask another question. Approximately how
3 many feet higher is the subject well than the pumping water?

4 A. This particular spring, 592, is fairly low in the
5 Henderson Creek drainage. So it is at a probably slightly
6 above elevation but it's not one of the high altitude base
7 springs that I would also like to touch on. This is a lower
8 altitude spring of property near the south fork, 592. It's
9 one of three springs identified in Mr. Buqo's rebuttal
10 document. This spring has been monitored quarterly by
11 General Moly starting in 2007. It is a seasonal seep. On
12 the tables you'll see reference to nine gallons a minute for
13 that spring as a maximum. I believe that is an error. I
14 reviewed that data, quarterly data, through the third quarter
15 of 2010. The highest value I saw was .9 gallons a minute so
16 I believe there's a typo in the database. But regardless,
17 that spring we've documented goes dry in quarter three and
18 quarter four of each year. Seasonal seep. So because you
19 see a point plotted within say this ten-foot threshold of
20 predicted drawdown doesn't necessarily mean that we're going
21 to be impacting the spring as a regional groundwater. I very
22 much view that as being a seasonal shallow source of water
23 that in my estimate I don't think we're going to affect that
24 spring. It doesn't have a regional groundwater connection.
25 I would say the same for springs 580 and 583.

1 Although we do not have those in our monitoring network, I
2 have not observed perennial flow from these. And by the way,
3 580 is approximately three-quarters of a mile upstream of the
4 main, the south Henderson Creek channel. 583 is
5 approximately a quarter mile off the channel. 593 is
6 approximately one half mile off the channel.

7 So we need to be very careful when we use those
8 model predictive results. We need to consider carefully what
9 the resource is. In the EIS we have developed system data
10 that they differentiate from shallow seeps or major regional
11 springs. They all show up at a point on the map equally.
12 And of course there are obviously differences in these
13 sources.

14 On the first spring set, 606, 609 and 610, very
15 interesting. These are higher in altitude on a hill that's
16 adjacent to Mount Hope. It's our own distinct topographic
17 feature. And what we find in those springs are collecting
18 monitoring data on I believe all three of those springs. And
19 they are contact springs.

20 Q. What does that mean?

21 A. Contact spring is a spring that is a water source
22 that's emerging along a geologic contact of differing
23 hydraulic conductivities. And specifically what is happening
24 in these cases is there's a limestone, the hill itself that
25 I've referenced is a limestone knob and it's sitting on top

1 of vinini and volcanic rocks. And very interesting in
2 geology it's interpreted to be a slide block but it's huge.
3 It's a hill. And so here the hydrogeologic condition that's
4 in effect is there's recharge to that limestone. The water
5 infiltrates, percolates down. The water moves horizontally
6 on this contact and discharges right on the lithologic
7 contact between the limestone and the vinini on the faults.

8 Q. Excuse me, Mr. Smith. A spring of that nature
9 would not be adversely affected or impacted by groundwater
10 above it, would it?

11 A. Again, I did not view this spring to be connected
12 to the regional groundwater flow system. It's a localized
13 condition that I firmly believe is not going to be impacted
14 over the course of the mine or after. It's its own small
15 localized system.

16 MR. FELLING: I'm sorry. What spring is it that
17 you're talking about?

18 THE WITNESS: These six. Excuse me. The three
19 that I was just referencing: 606, 609 and 610.

20 So we move further very high up in to the
21 mountain block to actually find the real base flow springs
22 for south Henderson Creek. They are topographically very
23 high and Mr. Katzer described these. They are -- And I will
24 add that Mr. Bugenig in his memo had an area circled as being
25 the source area. He has circled one spring but it's not the

1 primary source in the south fork. There is actually a spring
2 complex that's about one mile further upgradient that's the
3 primary source. It's deceptive on the ground. And when I
4 was first up there I thought that the location that
5 Mr. Bugenig was referring to was also the source. It's
6 located on or near site 592 but the real springs that are the
7 source of the base flow are higher up and they're in the
8 inset below the box on plate two and they're spring sites
9 589, 591, 594 and 596. And currently we're collecting
10 quarterly data on I believe one or perhaps two of those
11 springs in that complex.

12 Q. (By Mr. de Lipkau) Do those springs go all year?

13 A. They do.

14 Q. And you say source springs meaning source to the
15 creek?

16 A. Source to base flow in south Henderson Creek.

17 Q. Okay.

18 A. So those resources are high in water shed or high
19 in the water shed deriving their recharge locally from very
20 high altitude up in to the top of the Roberts Mountains. So
21 again, now, if we were to extrapolate out predicted model
22 drawdown to the regional flow system, you're obviously well
23 beyond the ten-foot threshold, perhaps you're within or
24 beyond the five-foot threshold. I don't know. But
25 regardless, I think the probability is very low of pumping

1 from the pit and subsequent formation of the Pit Lake
2 affecting those high altitude springs. You know, I can't say
3 anything with absolute certainty and I think the conditions
4 need to be monitored and confirmed. But I think over time
5 what we're going to see is these lower altitude springs which
6 are very mixed seasonal type seeps or localized flow systems.
7 I don't think they're going to be affected. Higher up in the
8 water shed I think they're too far removed for us to see any
9 impact.

10 Q. Would you please move on to Vinini.

11 A.. Vinini Creek to the north of Henderson, now, not
12 too much to say there. We're again pretty far beyond the
13 ten-foot threshold on model. Certainly we would predict a
14 few feet of drawdown in that water shed, but I don't think
15 there's going to be an impact.

16 And Vinini Creek, by the way, as Terry Katzer
17 described, is intermittent. Much of the mountain block
18 portion of Vinini Creek goes dry in the summer and the real
19 resources are also very high up in the water shed. So I
20 don't see any impact occurring to those resources.

21 Q. So is it your conclusion then that the proposed
22 or contemplated -- Is it your conclusion therefore that the
23 pumping of the contemplated volume of water will have no
24 impact upon the surface flows of Vinini Creek?

25 A. I think the probability is extremely low of that

1 happening.

2 Q. All right. One more question on Henderson Creek
3 and that is do the spring flows of Vinini Creek reach the
4 Henderson Creek, pardon me, reach the irrigated lands?

5 A. No. Based on my observation I believe Mr. Katzer
6 also reported the same is Henderson Creek once you get to the
7 basin out in front is ephemeral. There's not sufficient base
8 flow in these springs to produce a continuous flow all the
9 way down to the meadows on Garden Valley. So there's
10 ephemeral reach in there that goes dry. The real resource
11 that makes it down to those meadows is runoff. It's surface
12 water. It's snow melt. It's precipitation runoff. And
13 that's when you do have continuous flow all the way down to
14 those meadows and that's where there's resource action.

15 Q. Okay. Thank you. Let's move on to Exhibit 408.
16 Would you quickly review that document.

17 A. Yes. This is yet another pumping scenario that
18 we run in the same model, the current 2010 model. And the
19 distribution of pumping is basically the points of diversion
20 that were being heard in the 2008 hearing. So what we tried
21 to --

22 Q. Let me interrupt you here to clarify. Are you
23 saying that Exhibit 408 has -- 408, isn't it?

24 A. Yes.

25 Q. 408 has inserted the points of diversion heard by

1 this body in October 2008 in to the 2010 updated model?

2 A. That's correct.

3 Q. And what were the results?

4 A. The results are depicted on Figure 2 of Exhibit
5 408. There's a side-by-side comparison with the 11,300
6 acre-feet coming from the 2008 points of diversion contrasted
7 with our currently proposed points of diversion which are
8 consistent with the June 2010 filings by Mount Hope. So you
9 do see some similarities, but the biggest difference is you
10 do see more pronounced drawdown in to Roberts Mountains.
11 There is points of diversion placing higher stress on the
12 carbonate rock aquifer. There's some points that were
13 subsequently drilled and tested and we can't get a lot of
14 water from. We can still simulate what we can get from those
15 locations in this scenario. But I think there's an obvious
16 improvement with the current set of pending applications that
17 are before the State Engineer.

18 MR. DE LIPKAU: Okay. Do you have a copy of the
19 protest to Application 79911? Could I please have the number
20 of the exhibit please?

21 HEARING OFFICER WILSON: It is -- Protest 79911
22 is Exhibit 518.

23 Q. (By Mr. De Lipkau) Have you seen that document
24 before?

25 A. Yes, yes, I have.

1 Q. Would you please look at protest item number six
2 at the bottom of page two.

3 A. Okay.

4 Q. In your opinion will the contemplated pumping
5 adversely affect or impact the surface waters of Pete Hanson
6 Creek and its tributaries adjudication?

7 A. In my opinion, no, highly not.

8 Q. I'd like you to quickly review protest item
9 number one. Do you agree that the annual recharge to Kobeh
10 Valley is in the magnitude of 16,000 acre-feet annually?

11 A. That's the available estimate we have.

12 Q. Do you believe that the extraction of 11,300
13 acre-feet annually will cause minding of the groundwater
14 aquifer?

15 A. Not minding as stated.

16 Q. What is minding of groundwater?

17 A. Well, in my mind, minding implies that there's an
18 overdraft condition. And I guess I'll point to the example
19 of Diamond Valley.

20 Q. Are you saying Diamond Valley is a groundwater
21 basin being mined?

22 A. At present.

23 Q. Will Kobeh Valley be mined by the extraction of
24 11,300 acre-feet annually?

25 A. No. That consumptive rate of water or duty of

1 water is within the defined perennial yield for the basin.
2 So we're not overexploiting available resources in the basin.

3 Q. Please review protest item number two.

4 A. Okay.

5 Q. Could you please comment upon protest item number
6 two.

7 A. Well, my opinion is we're not going to have any
8 measurable effect on Diamond Valley whatsoever. Protest item
9 number two is pointing to several different things. It's
10 first USGS opinion currently insufficient to determine
11 interbasin flows. The Eureka County Devil's Gate GID, the
12 GID wells are within the agricultural area which is
13 experiencing several feet on the average of drawdown each
14 year. But again, I don't think we have evidence even at the
15 degree of interbasin flow that we've simulated in the model
16 that there's going to be any measurable drawdown induced in
17 Diamond Valley by pumping in Kobeh Valley.

18 Q. Thank you. Could you please turn to Exhibit 502.
19 Have you reviewed Exhibit 502?

20 A. I have.

21 Q. And basically what is Exhibit 502?

22 A. It's the technical memorandum produced by Dale
23 Bugenig dated November 24th 2010 and it's entitled
24 hydrogeology numeric flow model Mount Hope project, Eureka
25 County, Nevada.

1 Q. To whom is it addressed?

2 A. To the board of Eureka County commissioners.

3 Q. Do you have any comments to Exhibit 502?

4 A. Well, we haven't heard Mr. Bugenig's testimony
5 yet, but I want to take the opportunity to make some comments
6 on this document up front. On page three under discussion,
7 the first bold item is missing points of diversion. And I do
8 want to make clear for the record that plate one in Exhibit
9 39 shows existing active points of diversion for water rights
10 throughout the study area. You'll notice the date of that
11 database is January of 2010. Many of our databases were
12 updated this last winter before we had a major reissuance of
13 the draft model and report in April. So these water
14 rights -- And subsequent to that, the refinements to the
15 report had been fairly minor, editorial. The model was not
16 modified. The databases were not changed. There was text
17 edits, table edits and figure edits.

18 So just for clarity, both the database that's
19 included in the appendix and figures, all exhibits that
20 report water rights are current as of January 6th of 2010.
21 And we did not -- we do not want to modify or add or update
22 any of this work. We want it produced to the State Engineer
23 the exact same material that's being used in the EIS.

24 Q. Okay.

25 A. Mr. Bugenig goes on to report what he interprets

1 as bias injected in to the modeling report.

2 Q. What page is this?

3 A. This is also on page three.

4 Q. Okay.

5 A. I obviously disagree with the use of the word
6 "bias." And of course if there was this opinion there is
7 ample opportunity throughout the stakeholder and review
8 process to work those out.

9 But I do note that some of what he's included,
10 for example, under apparent bias from his perspective is the
11 use of the ten-foot predicted drawdown. I don't view that as
12 a bias. That's just what we were asked to produce as far as
13 a level of threshold of predicted drawdown. So that was
14 discussed amongst the stakeholders rigorously at times and
15 again that was not our decision and the State Engineer and
16 staff can use whatever threshold they think is useful, what
17 we've produced in this report.

18 Q. And again, the report was approved by the BLM?

19 A. That's correct. I need to note that on page nine
20 there is a Figure DCB1 and overlaid on Exhibit 39, Figure ES5
21 is the five -- is the five-foot predicted drawdown contour.
22 However, it's important to note that that is a cumulative
23 pumping scenario five-foot drawdown superimposed on the
24 proposed action ten foot. So in all honestly, if you want to
25 accurately understand the proposed projected five-foot

1 contour, you need to process the data. So we have the
2 five-foot threshold that is important to understand that to
3 the south Bobcat Ranch is continue to pump and contributes to
4 the extent of that five-foot drawdown. Diamond Valley is
5 simulated to continue pumping in time. That produces also
6 some of the five-foot drawdown you see extending up in to
7 Pine Valley. So you have commingled results in that
8 cumulative scenario.

9 Q. Cumulative results meaning?

10 A. We have commingled pumping influences together
11 which produce the interpreted level of drawdown.

12 Q. Which gives an added drawdown?

13 A. Right. If you're wanting to understand the
14 five-foot drawdown predicted by the model just by the mine
15 and its proposed pumping actions, this figure does not convey
16 that.

17 Q. All right. Thank you.

18 A. On page 15 figure, again this is a, some
19 editorial notes added to our Figure ES5. And on the
20 right-hand side of that figure it omits any reference to
21 Henderson Creek as a perennial stream. There was no
22 reference to any perennial streams on segment. There are
23 major drainage ways, drainage courses noted for reference but
24 there's not perennial or ephemeral reaches defined on this
25 work anywhere.

1 Q. Are you saying that the particular reach of
2 Henderson Creek is not perennial where highlighted?

3 A. It actually is perennial down to about the
4 right-hand extent of the oval that's been added. And then
5 beyond that it's an ephemeral reach and down to the
6 intermittent stream through Garden Valley.

7 Q. So Henderson Creek is not perennial from the high
8 sources all the way down to the pasture?

9 A. That's correct.

10 Q. All right.

11 A. Well, and the note on the top center says omits
12 or misplots springs that are a source of flow to Henderson
13 Creek in this area. Springs that contribute to flow of the
14 creek are covered by the creek. Again, those springs that
15 are circled are the springs that we discussed earlier, 580,
16 583 and 592. And I do not believe -- We're for certain that
17 one of them is not a source of flow to Henderson Creek. I do
18 not believe the other two are sources either.

19 Maybe just following on that thought quickly on
20 page 17, also a figure that has had some editorial editing,
21 there's a circle to the left of the oval that says --

22 Q. That's the blue circle?

23 A. I don't have a color version. It says perennial
24 springs here are source of flow to south fork of Henderson
25 Creek. There is a spring in that location. Let me just

1 reference it by number. Where the circle is on page 17
2 exhibit is at approximately our spring site 593. So again,
3 as I had mentioned earlier, I do believe there is a spring at
4 that location. There's some nice quick easy willows. But
5 that is not the primary base flow source on the south fork of
6 Henderson Creek. It's further up. It's about a mile further
7 upgradient with a spring complex that I referenced earlier
8 that's higher mountain block.

9 And honestly it takes a lot of work on the ground
10 to figure this out. I mean originally I thought that that
11 was one of the main sources for base flow also until
12 Mr. Katzer corrected me and we went for a little hike.
13 Actually it's a pretty rigorous mile-long hike. And you can
14 continue to follow that flow past that spring all the way up
15 to the high water shed. And again, we are monitoring that
16 flow at least one of those sources up in that high water
17 shed.

18 Q. Would you look at the second paragraph, page 18,
19 please.

20 A. Yes.

21 Q. Could you please comment upon that.

22 A. Well, I think Mr. Bugenig appears to be citing
23 something else other than our report, some reference about
24 flow from Kobeh to Diamond Valley about equivalent to a
25 strong garden hose. Obviously that's not in any of our

1 technical documents. We're trying to report flow rates in
2 quantities without any type of comparisons. I don't think we
3 tried to trivialize the contributions at all. In fact, I
4 think our flow model is predicting and supporting a greater
5 communication connection in the basin than as has been
6 reported by any investigators in the past. So I don't think
7 we've tried to trivialize anything here.

8 Now, the degree of capture predicted by the model
9 is quite small. It's quite small. And it is what it is.
10 It's just the data is the numbers coming out of being
11 produced by the model.

12 Paragraph three, just following that on page 18,
13 not quite understanding the comment there. It seems to be
14 suggesting that the geology as we represent in Whistler Peak
15 is advantageous for Kobeh Valley not producing effects on
16 Diamond Valley and vice versa for Diamond Valley producing
17 effects on Kobeh Valley. I don't understand that. Darcy's
18 law works equally in either direction. There's no flow
19 orientation preference that we can impose on the model.
20 Hydraulic communication as we simulated it is what it is.

21 At the bottom of page 18, construction water
22 supply wells. For clarification, they are included in the
23 model. Mr. Bugenig suggests they are not. But they are
24 included. They are, as we've discussed earlier, that the two
25 locations between the well field and the facilities in Kobeh

1 Valley.

2 Mr. Bugenig goes on to -- This is information
3 that you'll see also in the May 28th, I think the May 2010
4 memorandum produced on review of our drafts for EIS. And we
5 do acknowledge there's a shift in our calibration fit in
6 Diamond Valley when we're trying to match historic pumping
7 for the particular, for the time frame 1985 until 1995
8 approximately. And Dale's graphic here the --

9 Q. You mean Mr. Bugenig?

10 A. Mr. Bugenig's graphic on the bottom Figure CB3.

11 Q. Okay.

12 A. Is insightful and it's basically showing from my
13 perspective, and we've discussed this amongst all the
14 stakeholders, technical reviewers. It really to our eye and
15 the BLM and the third party eyes it suggests a shift in the
16 step function in that data. It's not a gradual progressive
17 misfit or something that -- it's really a step-type function
18 that I've tried to explain that we don't fully recognize the
19 physical process that have resulted in that step function.

20 He kind of concludes to some degree on page 21,
21 second paragraph, that the model overpredicts the effects of
22 Diamond Valley pumping in adjacent basins and the model
23 impacts arising from the mine pumping will be a portion or
24 greater. I disagree because we basically -- whether the
25 pumping in Diamond Valley is below or above historic, it's

1 all factored out when we subtract the no action. How good
2 are our estimates going in to the future? We don't know for
3 certain if pumping in Diamond Valley is going to be curtailed
4 in the future. Who knows if it could increase. There are
5 132,000 acre-feet of permitted rights in Diamond Valley. So
6 there's a lot of uncertainty there. We've just held to the
7 conditions.

8 But regardless of what the assumption is or what
9 condition is being simulated in Diamond Valley, it's
10 subtracted out so we get a good clean picture on the mine's
11 effects only, the proposed action effects.

12 Discussion under the bullet for Kobeh Valley, the
13 first paragraph under that subsection there is a third
14 sentence. It says, "Analysis of the test pump data was
15 accomplished by both analytical means and by using MODFLOW."
16 That is not correct in my view. We have not analyzed the
17 aquifer test and data using MODFLOW. We simply utilized the
18 data that we have collected, input those data as targets in
19 our model to see how well we could match that data. And so
20 it's not a means for us to analyze the data. It's simply
21 data that we can feed in to the model to further test the
22 calibration and refine the calibration.

23 Mr. Bugenig goes on to kind of conclude on page
24 24 in that subsection that he disagrees with the degree of
25 fit. Again, we could have discussed this more. We've

1 discussed it briefly in the stakeholders meeting, this data
2 has been before the stakeholders for several generations of
3 the report.

4 Q. Excuse me. Are you saying the discrepancies as
5 found on page 24 --

6 A. Oh, I'm sorry. Yeah. It's pointing to a couple
7 of the plots, again we have plots for six pumping tests where
8 we've done short term transient testing in the model. And
9 one thing we really struggle with is the grid resolution in
10 the model to try to undertake this aquifer test data,
11 especially this short term data, it's very sensitive to the
12 distance from the pumping well. In every case we have at
13 least one well that's within about 100 feet of the pumping
14 well. Our grid spacing is 1,000 feet. It represents both
15 properties of 23 acres plus or minus space. So there's a
16 limitation as to how well we can even approach fitting this
17 data.

18 I thought we did a reasonable job. And by the
19 way, it was also approved by BLM and their third party
20 consultant that we have done a reasonable job in this regard.

21 I did not give -- In going through this exercise,
22 I did not give latitude towards the storage coefficients. I
23 wanted to use the values we've estimated from our aquifer
24 testing. Very little latitude to the hydraulic conductivity
25 that came out of the testing and I gave a little bit because

1 we're dealing with zones and I mentioned the cell side.
2 Well, the zones are multiple zones lumped together to boot.
3 Multiple cells. Sometimes hundreds of cells lumped together
4 to find a zone. And that zone has one unique property.

5 So again, I don't think this was expressed in our
6 peer review efforts but I do know that the level of fit that
7 we were able to achieve in the model, which by the way -- so
8 it really only left with the latitude of making subtle
9 adjustments to how we were redistributing those zones and
10 representing the different hydrogeologic structures in the
11 model.

12 So that was really the latitude I had and I had
13 to work back and forth between the steady state model and the
14 short term transient test model to find a reasonable solution
15 in both model formats. So I think we've done a decent job in
16 that regard.

17 On page 24 there's mention of a discrepancy to
18 the southern central Kobeh Valley properties. Mr. Bugenig
19 goes on to explain some verbally reported observations from
20 an artesian well. It was actually an exploration bore hole
21 that was drilled. But there are no aquifer properties that
22 have been derived. Again, the subsection discrepancies with
23 southern central valley aquifer properties. I was aware of
24 this data. In fact the gentleman, the geologist that was out
25 drilling it contacted me several years ago when this hole was

1 being drilled. We tried to actually get some real data out
2 of it. We had reports that there was a pretty good artesian
3 flow initially when they drilled it. So to my knowledge it
4 wasn't open for very long.

5 Again, we didn't actually get any data other than
6 hearsay reports. And I'm certainly not going to accept
7 somebody's report of a thousand GPM or 200 as any type of
8 physical data that I can constrain or add to my model
9 databases. It's just hearsay from my perspective.

10 Q. Do you agree the contents on page 25 consider
11 entitled water monitoring mitigation?

12 A. Yeah. I think in general I do not, I do not
13 recall having any political thoughts about that section. We
14 recognize that we are going to have to generate some response
15 plans to be accepted by both the BLM and the State Engineer's
16 office.

17 Q. And those are of course currently underway?

18 A. That's correct.

19 Q. Okay.

20 A. I have no further comments on that document.

21 Q. Would you please look to page 29 under monitoring
22 and mitigation.

23 A. Yes. My only comment there is I don't really
24 think it's my place to suggest how the State Engineer might
25 structure or require the monitoring and mitigation plan be

1 developed. I think that's between the State Engineer and the
2 staff and the mine to work out. I'm certainly very happy to
3 provide, you know, whatever technical tools to help make
4 decisions that are needed for model runs or whatever might be
5 desired.

6 Q. Okay. Let's now go to 503. Please review that.

7 A. Yes. This is the technical memorandum prepared
8 by Carol Oberholtzer dated November 24th 2010.

9 Q. Okay. And would you please comment upon that
10 document.

11 A. Item number one, projected extent of the template
12 drawdown. Again, I don't think we need to reiterate there.
13 Ms. Oberholtzer also sounds her opinion as has done in the
14 past that they feel a five-foot threshold is more appropriate
15 use of this model. Again, this has really been, for this
16 document this has really been an argument between the county
17 and the BLM.

18 Q. When you say this document you mean the model?

19 A. Exhibit 39. We reproduced what we were asked to
20 produce.

21 Q. Okay. In cooperation and in conjunction with
22 Eureka County agents or employees?

23 A. Certainly their input and desires were not
24 ignored in any case and they were imbedded and discussed.
25 Not our final word on this matter though.

1 Item two, potential impact to accrued rights of
2 Henderson Creek. Again, I don't think there's an impact to
3 the decreed rights. I think the decreed rights are really
4 surface water runoff. There's no groundwater to the decreed
5 rights that are being used for irrigation.

6 Item three, impacts to the Vinini or Henderson
7 Creek water shed from the project baseline pumping. Well, I
8 think there's a lot of discussion about five foot versus ten
9 foot in this section. We've already covered that.

10 The figures produced, figures two and three on
11 pages five and six are, I believe figure five is probably
12 used in a cumulative action. I think both of these are using
13 cumulative action and not the proposed action. So you're
14 seeing combined effects of Diamond Valley and the mine.

15 Item four on page nine, use of large total head
16 change values. And I would like to refer back to Mr. Rumba's
17 testimony in 2008. We actually hadn't seen, I don't think we
18 saw this comment in the EIS process recently. I think we've
19 seen it in the past. We believe that it's appropriate to
20 report out calibration statistics in several different
21 manners but one manner is to report normalization by the
22 range in values.

23 We did, as a result of the county comment, divide
24 that out by hydrographic basin area. We thought that was
25 useful.

1 I think you'll note the tables that describe the
2 calibration statistics, the statistics are tighter, are
3 better fit for Kobeh Valley and Diamond Valley, which is also
4 some connecting that's really at the heart of what we're
5 trying to examine rather than Antelope Valley and Pine
6 Valley.

7 But again, we feel and it was the concurrence of
8 the BLM and the third party contractor that reporting out of
9 calibration statistics was standard, was a standard way for
10 reporting these.

11 And furthermore, that the level of calibration
12 achieved by both regional model and the local model was
13 acceptable and within an expected level for this type of --
14 these types of models.

15 Item five, sensitivity analysis. Again, comments
16 were not ignored. The county has wanted to see a different
17 format for sensitivity analysis. The format that we've used
18 where we apply equal percentages to all the different types
19 of parameters was accepted by the BLM. And so we did not go
20 any further with reporting the sensitivity analysis. We
21 think it provides a clear enough picture that a person, an
22 experienced hydrogeologist and the model would be able to
23 satisfy themselves if they understand the parameter
24 sensitivities.

25 And I want to back up. On the sensitivity

1 analysis under item number one on page two, however,
2 Ms. Oberholtzer is wanting to suggest that there be some
3 predictive uncertainty type analysis accompanying this
4 modeling effort. Those were dismissed by the BLM and the
5 third party reviewer. And basically the reason is it's
6 really not industry standard to try to do predictive
7 uncertainty. It's a very, very time consuming and rigorous
8 undertaking to do predictive uncertainty. And the reason I
9 say that is because what this type of process would involve
10 is recalibrating different scenarios of a model. And we have
11 to recalibrate enough different scenarios to be able to say
12 we have some significant goal behind how you quantify the
13 uncertainty.

14 To calibrate this model is a major undertaking.
15 It requires inverse techniques. It requires working between
16 transient models and steady state models. It requires
17 interaction between the local model and the regional model.
18 And even to undertake just one alternative scenario is a very
19 large undertaking and to undertake say perhaps 20 or 30 as a
20 minimum and have some statistical foundation to a predictive
21 uncertainty analysis, well, if the county would like to buy
22 me a super computer and maybe add three or four modelers to
23 my staff, I'll report back next year.

24 It's really -- It's great to talk about this
25 stuff and you see it reported in the literature. It's very

1 difficult to undertake this type of, in a defensible manner
2 to undertake a predictive uncertainty analysis. So very
3 quickly the other reviewing agencies dismissed going down
4 this path. It wasn't contemplated at all that we needed to
5 go down this path for this effort.

6 Item six, evapotranspiration simulation.

7 Ms. Oberholtzer examined some specific locations within the
8 model. And it's a regional flow model. There's going to be
9 pluses and minuses throughout the model domain. There's
10 going to be areas where the model levels are running high and
11 areas where it's running low. So particularly where she
12 chose to look there was not the expected evapotranspiration
13 coming out of the model domain as she would have
14 contemplated. It's just part of the approximation aspect of
15 the model. It's not exact. And if you start to dial in to
16 any specific location or point in the model there's going to
17 be errors plus or minus.

18 Again, the total phreatophyte discharge is, for
19 Kobeh Valley is around 16,000 acre-feet. That's what we were
20 striving to achieve. The ratio, there's a property we refer
21 to already with the evapotranspiration is about one-third
22 salt grass to two-thirds brush phreatophytes in the current
23 calibrated steady state model.

24 Under the figure six on page 11, Ms. Oberholtzer
25 has plotted the ET over time and projected that out to 500

1 years. She points out that it does not recover and questions
2 why. Well, the reason is because we have continued
3 agricultural pumping in Kobeh Valley. So you see on the
4 curve, on the plot, it's elapsed time on the X,
5 evapotranspiration rate increasing on the Y. There is
6 evapotranspiration. That's when the well filed is pumping.
7 There's then a recovery curve, but it recovers to a level
8 that is approximately 13,000 acre-feet rather than 16.
9 That's because we've continued approximately 3,000 or 3500
10 acre-feet of agricultural pumping at Bobcat Ranch and 3 F.

11 Q. Mr. Smith, do you know whether or not
12 evapotranspiration is the beneficial use in Nevada?

13 A. Not to my knowledge.

14 Q. Okay. Flooded cells.

15 A. Flooded cells, I believe we've already offered
16 testimony in this. I will note that Mr. Oberholtzer goes
17 through a computation suggesting 77,000 acre-feet sitting on
18 top of land surface. As I explained again, flooded cell is
19 modeling terminology. It only means that in our model that
20 the cell in layer one is now functioning as a confined flow
21 condition and there's a potentiometric head equal to the feet
22 which you can convert to pressure if you'd like, operating on
23 that cell. It does not change the water balance of that cell
24 at all. It does not, it is not simulating the representing
25 pooled water on top of the land surface. That's not how

1 MODFLOW works with the layer types that we established.

2 Item eight is drains. Ms. Oberholtzer indicates
3 that there is no flux in return or coming out of layer three
4 at row 117, column 32. There is -- That is the location of
5 the Bartine Ranch for wells submitting the model. And she's
6 incorrect. I confirmed it. I verified it. There is 630
7 acre-feet coming out of the drain in cell -- in layer number
8 three at that location. We can easily confirm that. There
9 is a flux coming out of that cell as is all of the drain
10 cells we've used for springs with those wells and I think
11 we've described how that's routed back in this case.

12 Item number nine, HFB, hydrologic flow boundary.
13 Actually HFB stands for horizontal flow barrier, for
14 clarification. It's MODFLOW module or package that we can
15 utilize. I'm actually not clear what the exercise was in
16 nine so I don't know how to respond to that.

17 Item number ten, conclusion. Second sentence it
18 starts off with ignoring early comments do not assist the
19 parties. Absolutely no comments were ignored. I think that
20 Ms. Oberholtzer is aware of this. We've vented and discussed
21 every major aspect that they've commented on in forums and
22 included the other stakeholders. There are differences. The
23 five-foot versus the ten-foot threshold, the calibration
24 statistics and whether our model is sufficiently calibrated.

25 You know, we have at the end of the day met the

1 satisfaction of the BLM and the third party reviewer. We
2 certainly tried to accommodate Eureka County's comment when
3 we could. There was a lot of definements and suggestions
4 incorporated and certainly it was very beneficial working
5 through the model with them and I believe they mind my
6 criticism. But no comments were ignored of any sort. And
7 they were carefully thought through. And it's just some of
8 the comments we did not accommodate or it was found by the
9 review team not to be appropriate to go down the path that
10 the county was suggesting.

11 MR. DE LIPKAU: I think I have no further
12 questions of Mr. Smith at this time.

13 HEARING OFFICER WILSON: Let's take a break
14 before we move to cross-examination. Try to come back at
15 2:35.

16 (Recess was taken)

17 HEARING OFFICER WILSON: Let's continue on with
18 cross-examination of Mr. Dwight Smith. Go ahead.

19 MS. PETERSON: Thank you.

20 CROSS-EXAMINATION

21 By Ms. Peterson:

22 Q. Mr. Smith. I'm Karen Peterson representing
23 Eureka County. And do you have Exhibit 39 in front of you?

24 A. I do.

25 Q. Both volumes?

1 A. Yes.

2 Q. Could you please turn to page 188 of volume one.
3 Do you have that?

4 A. I do.

5 Q. And under the section 4.4.4.5, discussion of
6 predicted impacts?

7 A. Yes.

8 Q. Do you see that there? And at the very beginning
9 you have some bullets points, potential impact to water
10 resources due to proposed pumping of non-water for the Mount
11 Hope project include and you've got diminished flow from
12 springs and diminished flow in perennial screen. Do you see
13 those bullet points right there?

14 A. I do.

15 Q. And going on further in the text you explain the
16 bullet points; is that correct?

17 A. I believe that's correct.

18 Q. So going to the last paragraph on that page --

19 MR. DE LIPKAU: Excuse me. What page?

20 MS. PETERSON: 188.

21 MR. DE LIPKAU: Thank you.

22 MS. PETERSON: Uh-huh.

23 Q. (By Ms. Peterson) First of all, you point out
24 that there's a table that lists the projected magnitude of
25 the water table drawdown; correct?

1 A. Yes.

2 Q. And then you state that the occurrence of springs
3 within the predicted area then act as primarily within the
4 Roberts Mountains; is that correct?

5 A. Correct.

6 Q. And then you say there's uncertainty regarding
7 hydraulic connection; correct?

8 A. That's correct.

9 Q. And then maybe read starting the last sentence
10 there on page 188 going to 189. Read that out loud please.

11 A. "However, the model offers the best available
12 tool from any predictions and it suggests a potential to
13 impact spring flows in Roberts Creek and Henderson Creek
14 water sheds."

15 Q. And then there's another table that -- And we're
16 going to get to the table so I'm not trying to skip over it.
17 But I also want to then direct your attention on that same
18 page, 189, to the second full paragraph, springs located in
19 lower altitude in the Roberts Mountains?

20 A. Yes.

21 Q. Do you see that? And could you read -- Well,
22 could you read it to yourself just to speed it along, speed
23 things along.

24 A. Yes.

25 Q. And that's the paragraph that I cited in my

1 opening statement; is that correct?

2 A. I don't recall.

3 Q. Well, if you don't recall, "The springs located
4 in the lower altitude in the Roberts Mountains are more
5 likely to be impacted --

6 HEARING OFFICER WILSON: Could you slow down
7 please. It's way too fast.

8 Q. (By Ms. Peterson) "Well fields resulting in
9 larger predicted drawdown of these locations."

10 A. Yes.

11 Q. That's what it states. And you talk about Mud
12 Spring and Lone Mountain Spring; is that correct?

13 A. That's correct.

14 Q. And that flow will likely cease at those two, at
15 Mud Spring and Lone Mountain Spring as a result of pumping;
16 is that correct?

17 A. That's correct.

18 Q. And then going down to the last paragraph on that
19 page you indicate that Roberts Creek and Henderson Creek are
20 perennial streams?

21 A. Correct.

22 Q. And they're within the proposed action composite
23 ten-foot drawdown?

24 A. Correct.

25 Q. And then there's also a discussion after that

1 about the base flows in Roberts Creek and Henderson Creek may
2 depend in part on springs that may be connected to the
3 regional groundwater system?

4 A. That's correct.

5 Q. In hearing your testimony earlier on direct
6 examination, your earlier testimony seemed to contradict
7 these statements in this report?

8 A. I don't agree.

9 Q. You don't agree? Well, for one, I believe you
10 testified that Henderson Creek was not a perennial stream?

11 A. No, that's not correct. I've testified that
12 Henderson Creek was perennial only in the mountain block
13 portion. At the base of the mountain block it becomes
14 ephemeral and also I think I mentioned through Garden Valley
15 it's an intermittent stream.

16 Q. But I believe you also testified that it was not
17 a perennial stream within the composite ten-foot drawdown
18 area?

19 A. I do not recall saying that.

20 Q. Would you agree with the statement here in your
21 report at the bottom of page 189 that Roberts Creek and
22 Henderson Creek are the only perennial streams within the
23 predicted proposed action composite ten-foot drawdown
24 contour?

25 A. I do agree with that. You have to keep in mind

1 that only portions of these streams, it's the mountain block
2 portions are defined as perennial. And at certain points in
3 the mountain front they become ephemeral. There's not
4 sufficient flow or in the case of Roberts Creek, flow is
5 diverted and impounded for irrigation at the mountain front.

6 At the base of Henderson Creek there's not
7 sufficient base flow in the springs to create perennial
8 conditions beyond the mountain front beyond the base of the
9 mountain.

10 Q. But doesn't this statement say that Henderson
11 Creek is a perennial stream within the predicted proposed
12 action ten-foot drawdown contour?

13 A. That's correct. That portion of Henderson Creek
14 is perennial.

15 Q. Within the drawdown contour?

16 A. Within our predicted ten-foot threshold drawdown.

17 Q. And I believe you testified that springs that
18 were in the lower altitude in the Roberts Mountains you
19 believed were seasonal?

20 A. I believe that statement was in reference to the
21 springs in the lower portion of the Henderson Creek water
22 shed. And I believe I referred to spring sites 592, 580 and
23 583.

24 Q. So your statement with regard to the springs in
25 the lower altitude of Roberts Mountains, the statement that's

1 contained here on page 189.

2 A. I'm sorry. Can you direct me to the paragraph.

3 Q. It's that second full paragraph. Springs located
4 in lower altitude in the Roberts Mountains.

5 A. Yes. We referred to, specifically to spring
6 sites. And I'm not referring to springs in this particular
7 paragraph. I'm not referring to the spring sites that we've
8 referenced in Henderson Creek.

9 Q. So none of your testimony today would -- I guess
10 your testimony today on the stand is that this paragraph on
11 page 189 is still accurate; is that correct? Is that still
12 your opinion?

13 A. Yes. I do believe, however, you have to very
14 much pay attention to the qualifying statements in each of
15 these paragraphs. I say, for example, starting at the bottom
16 paragraph of page 188, potential to impact to spring
17 resources. I'm not again suggesting that the model can
18 definitively say that there is an impact. It's giving us an
19 idea for potential for drawdown and regional flow system.
20 And then I go on to explain that there's certainties in
21 hydraulic connection. Things that I've already touched on,
22 in here and in my direct.

23 In the second paragraph on page 189, impacts
24 resulting from groundwater, this is the third sentence,
25 impacts resulting from groundwater pumping and dewatering

1 will probably be minimal in springs that are not directly
2 connected to the regional groundwater flow system. And I
3 would further say minimal or non-existent in some cases. I
4 don't know how much more you would like me to elaborate.

5 Q. Well, let me ask you this, the BLM process is to
6 evaluate impacts; is that correct?

7 A. It's to evaluate potential impacts, potential
8 impacts.

9 Q. And the State Engineer maybe has a different
10 regulatory role but he also needs to look at potential
11 impacts; is that correct?

12 A. He needs to consider those also.

13 Q. And your report lays out some potential impacts,
14 but I gathered from your testimony today that you disagreed
15 with some of the potential impacts that are laid out in this
16 report; is that correct?

17 A. No, that's not correct. This being an EIS
18 document, we have to go through and identify hopefully any
19 and all potential impacts. And here's the bullet list of how
20 it relates to water resources. Here are the potential
21 impacts that could result from pumping the Mount Hope
22 project. We have to identify those. And that's our attempt
23 here is to identify potential impacts. There are numerous
24 site specific circumstances that I've cited that at the end
25 of the day you're going to have to rely on the monitoring

1 program. There are uncertainties. And yes, there may be
2 some impacts. We can't accurately state or definitively
3 state by any means at this point that there will absolutely
4 be impacts.

5 I will say that there are two exceptions that I
6 feel because of proximity to the well fill that's Mud Spring
7 and Lone Mountain Spring, nothing is definitive, but at the
8 same time I think it's pretty likely that those stock water
9 resources will require mitigation. I think those stock water
10 sources would potentially cease to flow. I think we'll see
11 that effect fairly clearly and fairly soon in the pumping. I
12 don't want to suggest that those impacts can't be fully
13 mitigated.

14 Q. So you agree with the opinion from Mr. Katzer
15 yesterday regarding impacts from the mine's proposed pumping
16 to certain existing rights?

17 A. He was I think referencing these same references
18 in his testimony.

19 Q. And you agree with that?

20 A. Yes, I concur with Terry's testimony.

21 Q. So did you, the other alternative methods that
22 you and Mr. Childress and Mr. Katzer talked about for
23 determining impacts --

24 A. Yes.

25 Q. -- the other methods, have those been relayed to

1 the BLM?

2 A. The type of analysis we have used has been the
3 numeric flow model. That has been what we've used to make
4 these types of analysis. For a project of this scale and
5 magnitude it's becoming accepted practice in the EIS arena to
6 access these using numeric flow model. But there certainly
7 are -- We did utilize This type analysis to some degree and
8 looking at pumping distribution.

9 Mr. Terry Katzer and others, Mr. Bugo in his
10 original testimony certainly gave due consideration to are we
11 going to be pumping within the perennial yield, is there
12 sufficient resource in general to support a magnitude of
13 pumping suggested by the project. And that was really the
14 protest of their assessment.

15 And I think the answer in my opinion is pretty
16 clearly yes, yes, there is sufficient resource in this valley
17 to support this level of development.

18 Q. And I guess following up on that comment, you
19 testified earlier that the perennial yield in the basin is
20 16,000?

21 A. That's the currently accepted level.

22 Q. And Mount Hope's proposed pumping is 11,300?

23 A. That's correct.

24 Q. And the ET discharge in Kobeh Valley is
25 approximately I think you said 15,000 in your report?

1 A. Well, the model is calibrated very near to 16,000
2 also.

3 Q. For the ET phreatophytes?

4 A. Yes.

5 Q. And at the end of the mine life you will be
6 capturing 4,000 acre-feet per year of the phreatophytes?

7 A. 4,015 is at the mine year 44 projections.

8 Q. So while the mine is pumping that 15,000 or
9 16,000 minus your 4,000, that discharge will also be
10 occurring; is that correct?

11 A. I'm sorry. I didn't quite follow that.

12 Q. Well, do you -- were you here for Mr. Katzer's
13 testimony?

14 A. Yes.

15 Q. And he agreed with me that the mine may be
16 pumping and that's a point of discharge in the basin, right,
17 the mine pumping?

18 A. It will become a point of discharge.

19 Q. And then the ET is still a discharge, right, from
20 the basin?

21 A. It will be. It's a transitional process.

22 Mr. Katzer testified as to transitional storage concepts.

23 That concept applies to every basin in Nevada, every basin in
24 Nevada for every, actually every well anywhere that's been
25 pumped there's transitional storage. It's just a matter of

1 physics. You have to withdraw a certain amount of storage
2 even in equilibrium condition.

3 You know, I think you pointed out also you
4 referred back to Diamond Valley. Under current conditions,
5 the entire history of Diamond Valley agricultural has been
6 supported off of transitional storage. Even today the model
7 simulates only one quarter of the production pumping from
8 Diamond Valley is coming from evapotranspiration capture.
9 Three quarters of the annual production in Diamond Valley is
10 still occurring from transitional storage. So it's just a
11 physical reality. I don't know what else to say about it.

12 Q. Right. But I mean you're drawing from -- You're
13 pumping, whether you're pumping I guess it's from
14 transitional storage is taking 11,300 acre-feet out of the
15 basin; correct? The discharge is still occurring even I
16 guess at the end your mine life which is the most
17 phreatophytic discharge that you're going to capture if you
18 take 16,000, right, you said was what you put in the model
19 for the discharge?

20 A. I believe that's what the calibrated outflow is
21 for the model. Calibrated evapotranspiration discharge from
22 the model is approximately 16,000.

23 Q. Well, and you're going to capture four of that at
24 the end; right?

25 A. That's correct.

1 Q. Okay. So 12,000 of ET discharge is still going
2 to be occurring at the end of mine pumping; is that correct?

3 A. Yes, that's correct.

4 Q. And then there's already 1100 according to the
5 last ruling, 5966, there's already 1100 permitted acre-feet
6 of water rights in Kobeh Valley?

7 A. I haven't looked at that number.

8 Q. Well, I just got it from the ruling. So let's
9 assume that still is the case.

10 A. Sure.

11 Q. I mean that comes up to total discharge from the
12 basin of 24,400?

13 A. During a transitional period, again, it's
14 unavoidable. It's pure physics, pure groundwater hydrology.
15 You have to change gradients and that requires withdraw of
16 some storage water, transitional storage. It occurs in every
17 basin. It occurs for every well. It occurs in every basin.

18 Q. You'll agree that if my math is correct that's
19 the total discharge?

20 A. That sounds correct for that year.

21 Q. So let's go to tables -- Well, let me get one
22 more item from your text, page 190, third full paragraph. Is
23 the text notes at the very end that there will be significant
24 drawdown as projected for a well at the Roberts Creek Ranch.
25 Do you see that statement?

1 A. Yes, I do.

2 Q. And you agree with that?

3 A. I do. That well is basically within our well
4 field area. The well is 350 feet deep. If you look at the
5 predicted drawdown it is perhaps 60 or 70 feet. That well,
6 we have not found any water rights associated with that well.
7 And furthermore, it's been reported to us that that is not a
8 domestic well. The domestic supply has been reported to us
9 as being a spring source in the Roberts Mountains that's
10 piped down. So I haven't dug any further. I don't know if
11 there was a water right on that well for perhaps supplemental
12 underground. I don't know the purpose of that well. It is
13 situated next to the pastures that are irrigated. And it,
14 depending on how that well was utilized, it may be able to
15 accommodate 60 or 70 feet of drawdown or it may need to be
16 deepened. I really don't know how that well was utilized at
17 this point.

18 Q. And then moving to Table 4.4.8.

19 A. Yes.

20 Q. Maybe what you should do is explain what Tables
21 4.4.8, 4.4.9 and 4.4.10 are.

22 A. Yes. From our databases we have databases
23 presented as appendicies. One database is wells within the
24 studied area. This has been primarily derived from the
25 state's well database. We also have a database for water

1 rights. Again it was last updated in January of 2010. We
2 also have a database for springs that combines springs from
3 various different published data sets and sources.

4 So for the area within the predicted ten-foot
5 drawdown cone of influence we have then reported out all the
6 wells, water rights and springs from those data sets that is
7 within that ten-foot threshold predicted drawdown.

8 Q. And what's the difference between 4.4.8, 4.4.9
9 and -- Were you done? I'm sorry.

10 A. 4.4.8 is reporting the amount of wells within
11 that particular ten-foot drawdown. 4.4.9 is predicting water
12 rights within the projected ten-foot drawdown. 4.4-10 is the
13 projected springs from our spring database within the
14 projected ten-foot extended drawdown.

15 Q. And do you agree that there could be other water
16 rights that maybe you're not aware of or you haven't picked
17 up from the State Engineer's database that could possibly be
18 included in these tables?

19 A. That is certainly possible. We relied upon the
20 data dump from the state's offices. I will point out already
21 that I've discovered one error. And four of the water rights
22 here actually owned by Kobeh Valley Ranch, LLC that are
23 already on that list. Three of those have been updated in
24 your records subsequently. One has yet to be updated. But
25 the error, which I guess should be corrected in the state's

1 database, is for Permit Number V01953. It's a vested stream
2 surface water claim on Meadow Canyon Creek. It's reported
3 out of the NWR database as Township 20 north, Range 50 east,
4 Section 3. However, if you refer to the supporting map,
5 which is filed through that claim, the point of diversion is
6 Township 23 north, Range 50 east, Section 30. And that
7 places that right considerably outside the ten-foot
8 threshold. So that is an error that we did not discover
9 until after this report was made.

10 Q. And then 4.4.8, Table 4.4.8?

11 A. Yes.

12 Q. Well site number 310.

13 A. Yes.

14 Q. The site name is Roberts Creek?

15 A. Yes.

16 Q. And is that the well that's referred to in the
17 text?

18 A. That's correct. That is the well, it's in a
19 small well house adjacent to the pasture on the entrance road
20 to the Roberts Creek Ranch situated on the base of Roberts
21 Creek. It's reported from the well log 350 feet in depth,
22 static water level of 149 feet and our model predicted
23 drawdown at the end of year 44 is 69 feet. And again, to my
24 knowledge this is not a domestic well and I'm not sure how
25 this well is utilized today.

1 Q. What's the difference between Table 4.4.8 and
2 4.4.9?

3 A. 4.4.8 is the wells, the wells that not owned by
4 Eureka Moly, General Moly within that ten-foot predicted
5 drawdown. 4.4.9 is the water rights as of the January 2010
6 data dump.

7 Q. And then 4.4.10?

8 A. Yes. And again, that is from our composite
9 spring database which is completed, which is presented as an
10 appendix to our report. So that's our database on springs
11 reported out within the ten-foot predicted drawdown.

12 Q. And then on the bottom, the blue shading?

13 A. Yes.

14 Q. Could you please explain what the blue shading
15 is?

16 A. Yes. For clarity we've tried to identify the
17 blue shading is, indicates springs near the proposed pit
18 area. Because we have effectively two pumping centers by the
19 mine and two cones of depression, if you will, one is around
20 the pit and one is associated with the well field in Kobeh
21 Valley, so we differentiated those by color shading green.

22 Q. In the blue highlighting, I mean I don't think
23 you finished what the highlighting means. Maybe permanent
24 water level impacts?

25 A. That's true. Oh, I'm sorry. That's right.

1 Around the pit area, the drawdown, there's a permanent
2 drawdown because we're going to end up after mining Pit Lake,
3 Pit Lake is going to also consume water as I mentioned
4 estimated at I believe approximately 100 gallons per minute
5 over the long run. So it's going to be a sink. It's going
6 to be a hydraulic sink. Water from all around the pit in the
7 vicinity is going to flow towards the pit and it's going to
8 evaporate out of the Pit Lake. So since there is no rebound
9 or recovery, those water levels will remain suppressed in
10 close proximity to the pit.

11 Q. And some of the springs have a measurement date
12 in one of the columns?

13 A. Yes. Yes. And the dates are mostly looking at
14 they're 2006. This was mostly from some preliminary Recon
15 efforts. Our more rigorous baseline documentation efforts
16 began in 2007 and the mine continues those baseline efforts
17 today.

18 Q. But is it fair to say, I guess reading this
19 chart, that the basis of the flow measurement is the date
20 measured is this one time measurement right here? Is that
21 how I read this chart?

22 A. That's correct. I should point out that I
23 believe for spring site 592 reporting data 5-10 2006, nine
24 gallons a minute I believe should be .9 based on my review of
25 the data set for that site. That is one of our active

1 monitoring sites. But these are, yeah, these are
2 instantaneous one-time measurements.

3 Q. And if you don't have a water right permit number
4 there listed under that column what does that mean?

5 A. That means we have not identified any water right
6 associated with those springs. As I mentioned, our spring
7 data set is very large. I believe it contains over a
8 thousand points for the steady area. And many of the springs
9 that populate this database are springs that were identified
10 on the USGS seven and a half minute topo quads and we can get
11 that information electronically now through USGS sources.

12 So our attempt here is to compile a spring
13 database that has just all published sources of springs. And
14 of course we have springs designated on a seven and a half
15 topo it doesn't tell you much about the spring, how much
16 flow, it doesn't have any associated other information with
17 it. It's just a point on the map.

18 Q. But does it -- if you can't find a water right
19 associated with it does it mean that you don't know who owns
20 it?

21 A. No. It just means that there's no water right
22 identified in the state -- from the state database that we
23 can associate with that location. In most circumstances I
24 think there are many springs throughout the area and
25 throughout Nevada that don't have any water rights issued on

1 them. And then of course there's a hand full of springs that
2 do have water rights that are usually used for stock watering
3 purposes. But there's certainly many, many springs that
4 don't have water rights.

5 Q. And then going back to your testimony, I thought
6 you testified that spring 592 was low in the Henderson Creek
7 drainage?

8 A. Well, low from my perspective. But it is in the
9 mountain block environment but it's lower in the mountain
10 block than other spring resources.

11 Q. And it is a spring identified in blue here on
12 Table 4.4.10?

13 A. That's correct.

14 Q. That would be permanent -- There would be
15 permanent water level impact associated to that spring?

16 A. I wouldn't say that. I would say that the model
17 predicts a permanent drawdown in that area that approaches
18 ten to 11 feet. Again, as I've testified, number one,
19 there's an uncertainty attached with that model prediction.
20 We'll have to monitor that over the long run. But even if
21 there is a regional water table drawdown at that level I
22 don't think a spring like 592, which is a seasonal seep, has
23 any connection at all with the regional groundwater flow
24 system. So there's no hydraulic connection so there's no
25 impact to a resource.

1 Q. You know what, I'm just reading what your
2 language says right here. Blue highlighting indicates
3 springs near the proposed pit area that may have permanent
4 water level impacts?

5 A. That's right. Please leave the "may" in that
6 sentence. And every site has to be looked at very -- every
7 site has unique characteristics that needs to be carefully
8 considered. Every site is different. But the may is correct
9 because we have to identify every spring resource within that
10 area and we have to consider that as a maybe.

11 Q. And some of the other springs that you identified
12 in your earlier testimony were 580 and 583, which are also
13 shown in blue; is that correct?

14 A. Yes, that's correct.

15 Q. And also 606, 609 and 610?

16 A. That's correct.

17 Q. And those also show blue, may have permanent
18 water level impacts?

19 A. Right. Same reply there that it's the regional
20 water predicts some regional water table drawdown in those
21 vicinities, but again, I don't want to imply that there's
22 going to necessarily be an impact there. I think those
23 springs, if I can discuss 606, 609 and 610, are representing
24 contact spring source, it's a localized flow system from a
25 precipitation on a limestone knob that's infiltrating and

1 then migrating out along that contact. I don't associate
2 that with the regional flow system. That's a local flow
3 system. I can't say anything in absolute measure, but I
4 don't think those resources are going to be impacted even if
5 there is a regional water level drawdown there. That
6 magnitude I don't think they're connected to a regional flow
7 system.

8 Q. And those are all in Pine Valley?

9 A. That's correct.

10 Q. According to the chart?

11 A. Yes.

12 Q. And then going down to spring 721?

13 A. Yes.

14 Q. That's in green?

15 A. Yes.

16 Q. Which indicates it's a spring in the valley?

17 A. Yes, that's correct.

18 Q. And that's the Etcheverry Mud Spring permit
19 that's referenced on page 189 of your text?

20 A. That's correct.

21 Q. And that's the permit that I read from in my
22 opening statement?

23 A. I don't recall it.

24 Q. You'll take my word for it?

25 A. Sure.

1 Q. And in the text that also indicates that that
2 spring would have a permanent impact?

3 A. Well, not permanent because it does recover over
4 time. Well, it recovers to within one foot of pre-pumping
5 water levels. But that spring might be helpful to refer to
6 Figure 4.4-20. I know we don't have the well field
7 superimposed on this figure. But that spring is in very
8 close proximity to a proposed production well site. I
9 visited that spring and I actually recall finding a metal
10 casing in the middle of that. I don't know if that's a
11 spring that's just been augmented by drilling a well in the
12 middle of it. I'm not quite sure the conspiracies. But very
13 low flow supports a small pooled area of water that I've seen
14 wild horses and occasionally cattle using as a source of
15 stock water.

16 But I do, I think there's a high probability that
17 that spring will cease the flow of it is -- see the flow as a
18 direct result of pump-out from the well.

19 Q. It will cease the flow as a result of direct
20 pumping from the well field?

21 A. I believe it would.

22 Q. Based on the -- In the text it says based on
23 predicted drawdowns of 40 to 50 feet?

24 A. Yes, yes.

25 Q. So in the exhibit, Table 4.4.10, are the green,

IN THE SUPREME COURT OF THE STATE OF NEVADA

EUREKA COUNTY, A POLITICAL
SUBDIVISION OF THE STATE OF
NEVADA; KENNETH F. BENSON,
INDIVIDUALLY; DIAMOND CATTLE
COMPANY, LLC, A NEVADA LIMITED
LIABILITY COMPANY; AND MICHEL
AND MARGARET ANN ETCHEVERRY
FAMILY, LP, A NEVADA REGISTERED
FOREIGN LIMITED PARTNERSHIP,

Case No. 61324

District Court Case Nos.
CV 1108-15; CV 1108-156;
CV 1108-157; CV 1112-164;
CV 1112-165; CV 1202-170

Electronically Filed
Dec 27 2012 09:16 a.m.
Tracie K. Lindeman
Clerk of Supreme Court

Appellants,

vs.

THE STATE OF NEVADA STATE
ENGINEER; THE STATE OF NEVADA
DIVISION OF WATER RESOURCES;
AND KOBEH VALLEY RANCH, LLC, A
NEVADA LIMITED LIABILITY
COMPANY,

Respondents.

JOINT APPENDIX
Volume 3

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**CHRONOLOGICAL APPENDIX TO
APPEAL FROM JUDGMENT**

<u>DOCUMENT</u>	<u>DATE</u>	<u>VOL</u>	<u>JA NO.</u>
Petition for Judicial Review	08/08/2011	1	01-06
Notice of Verified Petition for Writ of Prohibition, Complaint and Petition for Judicial Review	08/10/2011	1	07- 08
Verified Petition for Writ of Prohibition, Complaint and Petition for Judicial Review	08/10/2011	1	09-59
Summons and Proof of Service, Kobeh Valley Ranch, LLC	08/11/2011	1	60-62
Summons and Proof of Service, Jason King	08/11/2011	1	63-65
Affidavit of Service by Certified Mail	08/11/2011	1	66-68
Notice of Petition for Judicial Review	08/11/2011	1	69-117
Summons and Proof of Service, Kobeh Valley Ranch, LLC	08/15/2011	1	118-120
Summons and Proof of Service, Jason King	08/15/2011	1	121-123
Summons and Proof of Service, The State of Nevada	08/17/2011	1	124-128
First Additional Summons and Proof of Service, State Engineer, Division of Water Resources	08/17/2011	1	129-133
Order Allowing Intervention of Kobeh Valley Ranch, LLC, to Intervene as a Respondent	09/14/2011	1	134-135

<u>DOCUMENT</u>	<u>DATE</u>	<u>VOL</u>	<u>JA NO.</u>
Partial Motion to Dismiss, Notice of Intent to Defend	09/14/2011	1	136-140
Order Allowing Intervention of Kobeh Valley Ranch, LLC, as a Party Respondent	09/26/2011	1	141-142
Answer to Verified Petition for Writ of Prohibition, Complaint and Petition for Judicial Review by Kobeh Valley Ranch, LLC	09/28/2011	1	143-149
Answer to Petition for Judicial Review by Kobeh Valley Ranch, LLC	09/29/2011	1	150-154
Answer to Petition for Judicial Review by Kobeh Valley Ranch, LLC	09/29/2011	1	155-160
Order Directing the Consolidation of Action CV1108-156 and Action No. CV1108-157 with Action CV1108-155	10/26/2011	1	161-162
Summary of Record on Appeal	10/27/2011	2-26	163-5026
Request for and Points and Authorities in Support of Issuance of Writ of Prohibition and in Opposition to Motion to Dismiss	11/10/2011	27	5027-5052
Order Setting Briefing Schedule	12/02/2011	27	5053-5055
Reply in Support of Partial Motion to Dismiss and Opposition to Request for Writ of Prohibition	12/15/2011	27	5056-5061

<u>DOCUMENT</u>	<u>DATE</u>	<u>VOL</u>	<u>JA NO.</u>
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Kobeh Valley Ranch's Joinder in the State of Nevada and Jason King's Partial Motion to Dismiss	12/15/2011	27	5084-5086
Petition for Judicial Review	12/29/2011	27	5087-5091
Petition for Judicial Review	12/30/2011	27	5092-5097
Summons and Proof of Service, The State of Nevada	01/11/2012	27	5098-5100
First Additional Summons and Proof of Service, State Engineer, Division of Water Resources	01/11/2012	27	5101-5103
First Amended Petition for Judicial Review	01/12/2012	27	5104-5111
Opening Brief of Conley Land & Livestock, LLC and Lloyd Morrison	01/13/2012	27	5112-5133
Petitioners Kenneth F. Benson, Diamond Cattle Company, LLC, and Michel and Margaret Ann Etcheverry Family LP's Opening Brief	01/13/2012	27	5134-5177
Eureka County's Opening Brief	01/13/2012	27	5178-5243
Eureka County's Summary of Record on Appeal - CV1112-0164	01/13/2012	28	5244-5420
Eureka County's Supplemental Summary of Record on Appeal - CV1108-155	01/13/2012	29-30	5421-5701

<u>DOCUMENT</u>	<u>DATE</u>	<u>VOL</u>	<u>JA NO.</u>
Order Granting Extension	01/26/2012	31	5702-5703
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Answer to First Amended Petition for Judicial Review	01/30/2012	31	5711-5717
Supplemental Petition for Judicial Review	01/31/2012	31	5718-5720
Petition for Judicial Review	02/01/2012	31	5721-5727
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Record on Appeal, Vol. II, Bates Stamped Pages 217-421	02/03/2012	32	5951-6156
Record on Appeal, Vol. III, Bates Stamped Pages 422-661	02/03/2012	33	6157-6397
Answer to Petition to Judicial Review	02/23/2012	34	6398-6403
Answering Brief	02/24/2012	34	6404-6447
Respondent Kobeh Valley Ranch, LLC's Answering Brief	02/24/2012	34	6448-6518
Reply Brief of Conley Land & Livestock, LLC and Lloyd Morrison	03/28/2012	34	6519-6541
Petitioners Kenneth F. Benson, Diamond Cattle Company, LLC, and Michel and Margaret Ann Etcheverry Family LP's Reply Brief	03/28/2012	34	6542-6565
Eureka County's Reply Brief	03/28/2012	34	6566-6638

<u>DOCUMENT</u>	<u>DATE</u>	<u>VOL</u>	<u>JA NO.</u>
Transcript for Petition for Judicial Review	04/03/2012	35	6639-6779
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Notice of Appeal	07/10/2012	36	6945-6949
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Excerpts from Transcript of Proceedings	10/13/2008	36	6952-6964

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<u>DOCUMENT</u>	<u>DATE</u>	<u>VOL</u>	<u>JA NO.</u>
Affidavit of Service by Certified Mail	08/11/2011	1	66-68
Answer to Verified Petition for Writ of Prohibition, Complaint and Petition for Judicial Review by Kobre Valley Ranch, LLC	09/28/2011	1	143-149
Answer to Petition for Judicial Review by Kobre Valley Ranch, LLC	09/29/2011	1	150-154
Answer to Petition for Judicial Review by Kobre Valley Ranch, LLC	09/29/2011	1	155-160
Answer to Petition for Judicial Review	01/30/2012	31	5704-5710
Answer to First Amended Petition for Judicial Review	01/30/2012	31	5711-5717
Answer to Petition to Judicial Review	02/23/2012	34	6398-6403
Answering Brief	02/24/2012	34	6404-6447
Corrected Answering Brief	04/05/2012	35	6780-6822
Eureka County's Supplemental Summary of Record on Appeal - CV1108-155	01/13/2012	29-30	5421-5701
Eureka County's Summary of Record on Appeal - CV1112-0164	01/13/2012	28	5244-5420
Eureka County's Opening Brief	01/13/2012	27	5178-5243
Eureka County's Reply Brief	03/28/2012	34	6566-6638
Excerpts from Transcript of Proceedings	10/13/2008	36	6952-6964

<u>DOCUMENT</u>	<u>DATE</u>	<u>VOL</u>	<u>JA NO.</u>
Findings of Fact, Conclusions of Law, and Order Denying Petitions for Judicial Review	06/13/2012	36	6823-6881
First Additional Summons and Proof of Service, State Engineer, Division of Water Resources	08/17/2011	1	129-133
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Notice of Entry of Findings of Fact, Conclusions of Law, and Order Denying Petitions for Judicial Review	06/18/2012	36	6882-6944
Notice of Appeal	07/10/2012	36	6945-6949
Opening Brief of Conley Land & Livestock, LLC and Lloyd Morrison	01/13/2012	27	5112-5133

<u>DOCUMENT</u>	<u>DATE</u>	<u>VOL</u>	<u>JA NO.</u>
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Order Granting Extension	01/26/2012	31	5702-5703
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Petition for Judicial Review	08/08/2011	1	01-06
Petition for Judicial Review	12/29/2011	27	5087-5091
Petition for Judicial Review	12/30/2011	27	5092-5097
Petition for Judicial Review	02/01/2012	31	5721-5727
Petitioners Kenneth F. Benson, Diamond Cattle Company, LLC, and Michel and Margaret Ann Etcheverry Family LP's Opening Brief	01/13/2012	27	5134-5177
Petitioners Kenneth F. Benson, Diamond Cattle Company, LLC, and Michel and Margaret Ann Etcheverry Family LP's Reply Brief	03/28/2012	34	6542-6565
Petitioners Benson, Diamond Cattle Co., and Etcheverry Family LP's Notice of Appeal	07/12/2012	36	6950-6951

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Record on Appeal, Vol. II, Bates Stamped Pages 217-421	02/03/2012	32	5951-6156
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Summons and Proof of Service, Jason King	08/11/2011	1	63-65
Summons and Proof of Service, Jason King	08/15/2011	1	121-123
Summons and Proof of Service, Kobeh Valley Ranch, LLC	08/15/2011	1	118-120

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Summons and Proof of Service, The State of Nevada	08/17/2011	1	124-128
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Supplemental Petition for Judicial Review	01/31/2012	31	5718-5720
Transcript for Petition for Judicial Review	04/03/2012	35	6639-6779
Verified Petition for Writ of Prohibition, Complaint and Petition for Judicial Review	08/10/2011	1	09-59

CERTIFICATE OF APPENDIX (NRAP 30(g)(1))

In compliance with NRAP 30(g)(1) I hereby certify that this Appendix consists of true and correct copies of the papers in the District Court file.

DATED: December 21, 2012.

/s/ KAREN A. PETERSON

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STATE OF NEVADA
DEPARTMENT OF CONSERVATION AND NATURAL RESOURCES
DIVISION OF WATER RESOURCES
BEFORE TIM WILSON, HEARING OFFICER

IN RE:

Applications 72695, 72696, 72697, 72698,
73545, 73546, 73547, 73548, 73549, 73550,
73551, 73552, 74587, 75988, 75989, 75990,
75991, 75992, 75993, 75994, 75995, 75996,
75997, 75998, 75999, 76000, 76001, 76002,
76003, 76004, 76005, 76006, 76007, 76008,
76009, 76483, 76484, 76485, 76486, 76744,
76745, 76746, 76802, 76803, 76804, 76805,
76989, 76990, 77171, 77174, 77175, 77525,
77526, 77527, 77553, 78424, 79911, 79912,
79913, 79914, 79915, 79916, 79917, 79918,
79919, 79920, 79921, 79922, 79923, 79924,
79925, 79926, 79927, 79928, 79929, 79930,
79931, 79932, 79933, 79934, 79935, 79936,
79937, 79938, 79939, 79940, 79941 and 79942

TRANSCRIPT OF PROCEEDINGS
PUBLIC HEARING/VOLUME II, pages 220-415
TUESDAY, DECEMBER 7, 2010
CARSON CITY, NEVADA

REPORTED BY:

CAPITOL REPORTERS
Certified Shorthand Reporters
BY: CHRISTY Y. JOYCE, CCR
Nevada CCR #625
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TUESDAY, DECEMBER 7, 2010, 8:30 A.M.

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HEARING OFFICER WILSON: This is the continuation of our hearing from yesterday. We left off, I believe, with the applicant's case, Dwight Smith; is that correct?

MR. DE LIPKAU: No. My first witness will be Mr. Jack Childress.

HEARING OFFICER WILSON: Jack Childress.

MR. DE LIPKAU: Before I call Mr. Childress I have a procedural request I'm going to make and that is the State Engineer should allow the applicant to call rebuttal witnesses if necessary because in accordance with Ruling 4848 the protestant has the burden of proof and inasmuch as the applicant has gone first we must anticipate what the protestants will attempt to do.

MS. JOSEPH-TAYLOR: Mr. De Lipkau, you're really hard to hear. Could you speak up.

MR. DE LIPKAU: Yes, I will. And in the interest of fairness and due process, we would like the right to call rebuttal witnesses if necessary. The rebuttal witnesses will be short. They certainly will not be made in an attempt to lengthen or unduly burden this hearing. We'll be very, very quick on that point. We have made a reasonable and diligent effort to anticipate what the protestants will do and say in our case in chief, but of course we cannot anticipate

1 everything. So with that request we would like the right to
2 call rebuttal witnesses if necessary.

3 HEARING OFFICER WILSON: Would you like to
4 respond?

5 MS. PETERSON: I did respond yesterday, I
6 thought.

7 HEARING OFFICER WILSON: You did. I'm just
8 giving you additional opportunity.

9 MS. PETERSON: Thank you. I appreciate that.
10 The notice clearly states when everybody was supposed to
11 submit their evidence and their documentary exchanges and
12 that the applicant's case would be presented in the first two
13 days and the protestant's case would be presented in the last
14 two days. And it's the same procedure that we followed last
15 time except the parties are flipped and we did not -- we
16 would have loved to have presented rebuttal testimony in the
17 last go-around but we were not afforded the opportunity to
18 present rebuttal testimony in the last go-around. So since
19 you haven't ordered it, it shouldn't be ordered at this point
20 in the proceeding.

21 MS. JOSEPH-TAYLOR: The State Engineer has given
22 me the opportunity to respond to this a little. Mr. de
23 Lipkau, you're picking an old ruling, the Yucca Mountain
24 ruling, where it says generally the protestants go first.
25 That procedure has changed dramatically since that ruling has

1 came out. The applicant goes first in many cases now. And
2 there are other instances where the State Engineer says the
3 protestant has the burden to prove their case but the
4 applicant also has burden of proof.

5 So you're making this issue out of going first
6 and you're not alone. It happens in many of these hearings,
7 these big hearings, these more complex hearings. And the
8 State Engineer has said he would like to wait and see if we
9 even need rebuttal evidence.

10 But Ms. Peterson is right, in other cases we
11 haven't done it. Our process is to give a full and fair
12 hearing. We have this dual exchange but you're picking on
13 one ruling that isn't the standard anymore.

14 MR. DE LIPKAU: When you say a full and fair
15 hearing, if a witness for one side directly contradicts a
16 witness from the other side, the parties, either party,
17 should have the right to say no, here's what I said or the
18 distance is X and not Y. In fairness we have to anticipate.

19 If we were to compare this to a trial, the
20 plaintiff always goes first. The plaintiff cannot discuss
21 the defendant's witnesses or evidence prior to they being
22 introduced by a defendant. And what we've done, quite
23 obvious, we have had to discuss defendants, pardon me,
24 protestants' exhibits before they're introduced. It makes it
25 very, very awkward and it is totally different than a regular

1 trial.

2 MS. JOSEPH-TAYLOR: We understand that, Mr. de
3 Lipkau. And the hearing rules provide for that and the
4 hearing rules provide for flexibility. It's your model
5 that's the biggest thing at issue here. And how can we even
6 under their cross-examination until we've heard your model
7 evidence.

8 MR. DE LIPKAU: Right.

9 MS. JOSEPH-TAYLOR: And the hearing rules provide
10 the State Engineer with great flexibility. The hearing rules
11 provide for rebuttal if necessary. But the State Engineer
12 does not want to make that decision now. So we understand
13 your motion. It stands. But let's wait and see until we get
14 there.

15 But you're wrong on the burden of proof issue.
16 And it's in other rulings. Both sides have burden of proof.

17 MR. DE LIPKAU: I couldn't agree more.

18 MS. JOSEPH-TAYLOR: Okay.

19 MR. DE LIPKAU: But the point is the protestant
20 goes first.

21 MS. JOSEPH-TAYLOR: Not always.

22 MR. DE LIPKAU: I know that. And I know the
23 history behind it because I was there. The point I'm trying
24 to make is we don't want to call unnecessary witnesses in
25 anticipation of something that might not occur. It will

1 waste time. And if we can call that rebuttal witness for
2 five minutes, the problem is resolved, rather than two hours
3 of testimony which is unnecessary. That's the point I'm
4 making.

5 MS. JOSEPH-TAYLOR: And the State Engineer has
6 said he's going to wait and see if they're even necessary
7 after we're done with the cases.

8 HEARING OFFICER WILSON: All right. Let's call
9 your next witness.

10 MR. DE LIPKAU: Mr. Jack Childress.

11 (Witness was sworn in)

12

13 JACK CHILDRESS

14 Called as a witness on behalf of the
15 Applicant, having been first duly sworn,
16 Was examined and testified as follows:

17

18 DIRECT EXAMINATION

19 By Mr. de Lipkau:

20 Q. Would you please state your name and spell your
21 last name please.

22 A. Jack M. Childress. Last name is spelled
23 C-h-i-l-d-r-e-s-s.

24 Q. What is your business address?

25 A. 11045 Donner Pass Road in Truckee, California.

1 Q. What is your educational background?
2 A. I have a Bachelor of science in geology from
3 Montana State University and graduate courses from the
4 University of Montana.
5 Q. In what curricular?
6 A. Geology.
7 Q. What is your occupation?
8 A. I'm a hydrogeologist.
9 Q. How long have you been a hydrogeologist?
10 A. Approximately eight years.
11 Q. With whom are you employed?
12 A. Interflow Hydrology.
13 Q. How long have you been with that entity?
14 A. Four years.
15 Q. What did you do prior to that?
16 A. I was a hydrogeologist for the State of South
17 Carolina
18 Q. Do you have any registrations?
19 A. I'm a licensed professional geologist in the
20 State of California.
21 Q. What are your current duties or tasks with your
22 current employer?
23 A. I'm a senior hydrogeologist at Interflow
24 Hydrology.
25 Q. And have you been a hydrogeologist during the

1 entire four-year period you worked with Mr. Smith?

2 A. That is correct.

3 Q. Have you performed any hydrologic duties or
4 services for KVR, the applicant in today's hearing?

5 A. Yes, I have.

6 Q. Would you please describe the duties? When did
7 they commence?

8 A. Approximately three and a half years ago is when
9 I became involved in the project. I've been involved in
10 almost every aspect from well field exploration to compiling
11 geologic data.

12 Q. Sorry to interrupt. When you say the project do
13 you mean --

14 A. The entire Mount Hope project.

15 Q. The subject of this hearing?

16 A. That's correct. I'll continue. I've been
17 responsible for compiling data sets that are model input
18 files such as well data sets, springs data sets, the geology
19 that goes in to the model helping to develop a conceptual
20 model as well as analyzing aquifer test data.

21 Q. With whom did you work in completing these
22 duties?

23 A. I worked with my employer, Dwight Smith, Terry
24 Katzer, the late Tom Buco, Dave Hawkins.

25 Q. And who is Mr. Hawkins?

1 A. Mr. Hawkins is a private hydrogeologic consultant
2 that works with General Moly. He is based out of the Tucson
3 area.

4 Q. I see.

5 A. I'll continue. I've also worked with many of the
6 mine staff and staff from Montgomery and Associates as well
7 as staff from the Bureau of Land Management and a third party
8 contractor who approved this report.

9 Q. When you say this report?

10 A. I'm talking about Exhibit 40.

11 Q. Okay. We'll get to that in a moment.

12 Approximately how many days have you spent on this endeavor?

13 A. Over the last three and a half years I would
14 estimate about 250 days.

15 Q. And of those 250 days how many were spent in the
16 field?

17 A. I would estimate approximately 30 days between
18 some geologic mapping, some stream gauging, well and aquifer
19 test oversight and site visits.

20 Q. And what was the purpose of your employment or
21 duties?

22 A. With regards to Exhibit 40 or --

23 Q. Yes.

24 A. The primary duties are to compile data from the
25 well field area everything that was presented up to Exhibit

1 115 of the 2008 hearing. That was the Buqo report. And to
2 provide input from the well field to the numerical model.

3 Q. At this time I'd like to introduce Exhibit 40.
4 It is entitled Kobeh Valley well field data summary report.
5 Have you reviewed Exhibit 115 presented at the 2000 -- the
6 October 2008 hearing?

7 A. I have.

8 Q. Would it be a correct characterization that
9 Exhibit 40 in front of you now is a continuation or update of
10 the prior Exhibit 115 report prepared by Mr. Buqo?

11 A. I would say that is correct. It basically
12 incorporates about two more years of exploration efforts in
13 the well field area.

14 Q. So it's a continuation?

15 A. It is a continuation.

16 Q. Are you in any way criticizing or refuting
17 anything found within Mr. Buqo's report, Exhibit 115?

18 A. No. That is not my intent.

19 Q. Okay. So is it a true characterization then that
20 your intent is to update the Buqo report?

21 A. That is exactly my intent.

22 Q. Okay. Could you tell us the difference between
23 Exhibit 40 and old Exhibit 115?

24 A. Sure. I'm going to be referring to figures in
25 Exhibit 40. And if everybody wants to bookmark these as we

1 go along it may help the process. I'm going to be looking at
2 Figure 10, 42, 43, 45, 46 and 20. Start with Figure 10.
3 It's labeled test and monitoring well locations in Kobeh
4 Valley. At the time that Exhibit 115 was presented in 2008
5 there were approximately ten or 12 wells described.

6 As of this report, Exhibit 40, we present data
7 from approximately 40 wells. So we've definitely increased
8 the database of knowledge in the well field area. In
9 particular we've expanded our knowledge of the basin fill
10 aquifer. And that's exemplified in Well 228, Well 229 and
11 Well 222.

12 In addition, at the time of the Buqo report,
13 that's Exhibit 115, from 2008, when that report was prepared
14 they were just finishing a 31-day aquifer test at a well
15 called 206. And there's information in the Buqo report that
16 outlines that test. Since that time we have tested 12
17 additional wells for a total of 13 wells in the well field.

18 Q. Excuse me. Would these be referred to as aquifer
19 tests?

20 A. That is correct.

21 Q. Okay.

22 A. So since the Buqo report we've got approximately
23 41 days of aquifer testing that is not presented in the Buqo
24 report. So 12 additional wells.

25 In addition to just installing wells we've

1 increased our knowledge of the geology of the southern
2 Roberts Mountains in Kobeh Valley. And at this time I'll
3 look at Figure 42.

4 Figure 42 is a generalized geologic map of the
5 central Kobeh well field area. It's meant to be kind of a
6 simplistic-looking map. We've got a much more complex
7 version of this map in Exhibit 39 that will appear later.

8 And as you look at the Figure 42 you'll notice we
9 have different colors representing different rock types. The
10 shades of blue are the carbonate rocks. There's quite a few
11 different formations that are in the carbonate package. We
12 have what appears as a brown or purple shade to the west of
13 these carbonate rocks and that is predominantly the Vinini
14 formation and it's a dark shale and soot stone.

15 Further west we have a well labeled EW 1 and
16 that's near the Old Gold Bar Mine. And of course further to
17 the east we have red symbols shown. Those are volcanic
18 rocks. The dark lines on the map are known faults. And the
19 red lines on the map are faults that we interpret to be
20 hydraulic barriers, barriers to groundwater flow, meaning
21 that water has a very difficult time moving across those
22 barriers.

23 Q. Would you please indicate where this barrier is?

24 A. There are several shown on the map. There are a
25 series of southeast to northwest trending faults near what's

1 labeled as Roberts Creek Road on the map in the southeastern
2 portion. Surrounding both sides of a long red symbol that is
3 of the salt ridge. We have a prominent southwest to
4 northeast trending fault system that is the basin bounding
5 fault for the southern end of the Roberts Mountains. That
6 fault is between Wells 213 and the lower Roberts Creek
7 monitor well which is abbreviated LRCMW on the map.

8 If we continue to look at this map, we see that
9 there are three lines of sections labeled AA prime through CC
10 prime. And they are generally west to east sections. These
11 correspond to the subsurface cross-sections in Figure 43.
12 And I'm going to refer to that figure now.

13 So through compiling the geology of the area
14 existing maps, doing our own mapping and doing some
15 subsurface drilling and taking all the information from our
16 test and monitor wells, we've been able to develop a series
17 of cross-sections.

18 THE STATE ENGINEER: I don't have 43,
19 Mr. Childress.

20 THE WITNESS: I'll give you my copy. That looks
21 like a reproduction error. Ross, may I borrow yours?

22 HEARING OFFICER WILSON: I'd like to make sure
23 everybody has it. Let's be off the record.

24 (Discussion held off the record)

25 HEARING OFFICER WILSON: Go ahead, Mr. Childress.

1 THE WITNESS: Again, we're looking at Figure 43.
2 There's three cross-sections shown, AA prime through CC
3 prime. Working from the top of the page down. We're going
4 from north to south.

5 The general structure of northern Kobeh Valley
6 again on the west side of what was Figure 42 and is shown as
7 AA prime is we have what's called Gold Bar Horst. A horst,
8 h-o-r-s-t, is a comparatively uplifted block of rock. And to
9 the east of it up the Gold Bar Horst we have a comparatively
10 down draw block that's in an area that's labeled the range
11 front fault zone. We have to the east of that range front
12 fault zone a central horst, another uplifted block. And then
13 we have another drop in structure of the down draw area.

14 And then along Roberts Creek Road we have a
15 carbonate block that has been comparatively uplifted. We
16 have many wells that are drilled in that carbonate block that
17 are numbered 205, 206, 214, 213, 215 and further to the north
18 the northern -- the lower, pardon me, and middle Roberts
19 Creek monitor wells.

20 When the Bugo report came out we had assumed
21 based on Figure 42 and noting all of the carbonate rocks up
22 in the mountain block that the floor of the basin we thought
23 at the time was probably carbonate rock. Through drilling
24 Wells 209, 220, 229, 223 and 208 we know that the floor of
25 the basin is probably almost exclusively vinini.

1 One thing of note --

2 Q. (By Mr. de Lipkau) Excuse me, Mr. Childress.
3 What does predominantly vinini mean?

4 A. It means we haven't found any carbonate so I'm
5 assuming it's all vinini.

6 Q. Are you saying that subsequent to the Exhibit 115
7 Bugo report that the -- that at that time the carbonate
8 aquifer was overestimated?

9 A. That may be the case. Through the additional
10 drilling we've revised our conceptual model of the
11 hydrogeology. No longer do we believe that there are
12 carbonate rocks underneath the basin. They're at great
13 depth.

14 Q. Right. Please continue.

15 A. One thing of particular note, and this may help
16 explain some of the red lines drawn on the east side of
17 Figure 2, those red lines being hydraulic barriers, what we
18 infer to be hydraulic barriers, is the eastern portion of BB
19 prime. We have this elongated ridge of salt that we've
20 creatively called the salt ridge that has been down dropped
21 several hundred feet by several faults to the east. And we
22 believe that that creates a fairly significant barrier to
23 groundwater flow.

24 Underlying that salt flow, we actually did a
25 series of diamond drills on 203 and 204, the material beneath

1 the salt is extremely indurated and stiff conglomerate.

2 Q. What does that mean?

3 A. That means that -- Just that. It's very stiff
4 and it's very hard. It's a rock as opposed to sediment.
5 What that material appears to be it has a very fine grain
6 matrix but it has many, many cobbles that are imbedded in it
7 and what we believe that is in the salt above, this is a rift
8 valley and it looks like there was a great deal of faulting
9 right before the inception of the dikes that are associated
10 with the northern Nevada rift. We had flood salts from those
11 dikes that came down in this valley and they were
12 subsequently faulted.

13 So in addition to this geology, we have been able
14 to get some precision surveys on all the well head elevations
15 that we have and that gives us good control on the
16 groundwater elevations.

17 I'm going to be referring to Figures 45 and 46.
18 And we have quite a few wells that are in the basin fill
19 aquifer and quite a few wells that are in what we would call
20 hard rock aquifer. Does everybody have Figure 45 and 46?

21 HEARING OFFICER WILSON: Are we all there? It
22 looks like we're good to go.

23 THE WITNESS: So at the top of Figure 45 we have
24 the well name, the depth, the water and the elevation of the
25 water table.

1 Q. (By Mr. de Lipkau) Let's make sure we all know
2 where the well is that you are currently discussing.

3 A. I'm not discussing any current well.

4 Q. Okay. Let us know when you get to it.

5 A. Okay. And the bottom half of Figure 45 would be
6 the water level contours. It's the elevation of the water
7 table from those wells.

8 One thing of particular note on this figure would
9 be the water level difference between 213, 214, 215, 206 and
10 205 which all have water levels almost within a foot or two
11 of each other. And the wells to the north of the faults
12 shown in the figure, the south, southwest to northeast
13 running fault.

14 Q. Would you please just tell us where that fault
15 is?

16 A. That fault is shown very close to Well 213. To
17 the north of that fault in both the lower and middle Roberts
18 Creek monitor wells, those are two different wells, we have
19 water level elevations that are over 300 feet different and
20 to the south of the fault. And again, I'll note that if we
21 do look back at I believe it's Figure 43, BB prime, CC prime,
22 and noting the carbonate block that appears as blue shades on
23 the eastern part of these cross-sections, Wells 205, 206,
24 213, 214, 215 all appear in this carbonate rock. And again,
25 it's important to note that their water levels are extremely

1 similar. And to me that always indicates some degree of
2 compartmentalization and that those wells are well connected.

3 Q. Mr. Childress, I want to go back to Figure 45 and
4 I want you to carefully describe where the fault is that you
5 just described.

6 A. Sure.

7 Q. Is it on the upper or lower portion?

8 A. In both halves of this figure, 45, the fault
9 appears basically in the center of each subfigure. It is
10 shown at Well 213 and extending to the northeast. That same
11 fault appears on Figure 42 that we discussed earlier.

12 Q. Excuse me. Is the fault the red line on both
13 charts starting with I'll call it the dot for RWX213M?

14 A. Yes. It's just to the north. If we were to zoom
15 in it's actually just to the north of 213M and extending to
16 the northeast and to the southwest.

17 What's shown on Figure 45 as far as the fault
18 configuration is slightly different than on 42.

19 Q. Okay.

20 A. The reason for that is this is a USGS --

21 Q. This you mean 45?

22 A. Thank you. The red line shown on Figure 45 is a
23 shake file from the USGS showing quaternary fault, fault or
24 faults that have believed to have ruptured in the last 1.4
25 million years.

1 So because we've got this fault between 213M and
2 lower and middle Roberts Creek monitor wells that creates 330
3 feet of difference we have a fairly firm belief that that's a
4 barrier to groundwater flow.

5 I'm going to refer to Figure 20 at this time. As
6 I mentioned earlier --

7 MR. FELLING: What page is that?

8 THE WITNESS: I'm sorry. What?

9 MR. FELLING: What page is that on?

10 THE WITNESS: 52, 54.

11 HEARING OFFICER WILSON: Okay. We're there.

12 MR. DE LIPKAU: It's on page 55 of Exhibit 40.

13 THE WITNESS: Okay. We're looking at Figure 20.

14 And it shows drawdown in Wells 205, 206, 213, 214 and 215
15 from an 11-day aquifer test of a well named 214-T. What we
16 need to note on this figure is that the rate of change of
17 drawdown basically the slope is fairly identical for Wells
18 214-M, 215-M and to a large extent 206 and 205. The slope of
19 drawdown for 213-M, which is shown with the purple symbols
20 there, is nearly twice that of all the other wells. The
21 reason for that is because it's closer, almost sitting right
22 near what we refer to as a negative boundary condition.
23 There's not enough water coming in to counteract the drawdown
24 effects from the pumping test. So it's literally drawing
25 down twice as fast as any other well. And it's actually, you

1 know, much farther away than say 215-M in the pumping well.

2 One thing of note is that we did not see any
3 drawdown during this test at the lower Roberts Creek monitor
4 well. The lower Roberts Creek monitor well and the middle
5 Roberts Creek monitor well are on the same order of magnitude
6 distance away from the pumping well as say 205 and 206 where
7 we did see drawdown.

8 And what that tells us is that we cannot
9 propagate drawdown across that fault. And that's further
10 corroborated by the fact that 213 drew down faster than any
11 other well comparatively given that rate.

12 So in summary, the main difference between this
13 report and Exhibit 115, the 2008 hearing, would be a much
14 expanded well coverage in the well field, well defined
15 geology, well surveys where we've got good control and water
16 elevation and we've identified a major range front boundary
17 between the Roberts Mountains and our well field area.

18 Q. Your opinion would pumping in the requested sites
19 as set forth in the application cross the boundary or cause
20 an effect across the boundary?

21 A. Ross, I think it would be impossible. We tried.

22 Q. So in conclusion then what is, in your opinion,
23 what is the effect of pumping at the desired points of
24 diversion upon the surface waters of Roberts Mountain?

25 A. I think it would be absolutely unmeasurable.

1 Q. Using the same exhibits, have you formed an
2 opinion as to the effect of pumping at the desired points of
3 diversion upon the well fields in Diamond Valley?

4 A. I'm going to have to agree with Mr. Katzer on
5 that point that given the large water level disparity as
6 shown in Figure 46, where we've got a 6,000 foot contour near
7 the Devil's Gate and we know we have water levels that are
8 anywhere between 70 and a hundred feet lower east of the
9 Devil's Gate and considering the fact that we've had a 50 or
10 60-year pumping test for many decades above the perennial
11 yield in Diamond Valley and have not seen than effect in
12 Kobeh Valley, I find it extremely hard to believe that by
13 pumping below the perennial yield in Kobeh Valley can have
14 any effect on Diamond Valley.

15 Q. And that is your conclusion?

16 A. That is my conclusion.

17 Q. Would you like to go back to the executive
18 summary of Exhibit 40 found on page eight. Would you quickly
19 proceed through and summarize the executive summary?

20 A. Do you want me to read?

21 Q. I don't want you to read it. I'd like you to
22 make certain that your prior testimony includes everything in
23 the executive summary.

24 A. Okay. So the executive summary would be
25 basically a summary of what this report is about and what we

1 accomplished with this report. We reviewed the existing
2 geology and the hydrogeologic conditions of Kobeh Valley. We
3 made interpretations on the existing geology and we would
4 find those through drilling.

5 Prior to drilling we conducted field
6 Reconnaissance as well as remote sensing to determine likely
7 drilling locations. In the appendices of this report there
8 contain geophysical data. It's basically subsurface data on
9 the physical properties of the rocks below parts of the well
10 field.

11 Also in the appendices of this report we have
12 wire line geophysical data. We conducted an extensive
13 drilling program. We conducted 13 aquifer tests. This would
14 also be inclusive of what was presented in the Buqo report.
15 And we have made an analyses of the aquifer response from the
16 pumping test and we've developed geologic cross-sections in
17 back of the well field area.

18 Q. Are you aware of AQTEsolv?

19 A. I am.

20 Q. Would you briefly describe AQTEsolv in exhibit,
21 appendix B of Exhibit 39.

22 THE COURT REPORTER: Can you spell that for me
23 please?

24 MR. DE LIPKAU: Can you spell it?

25 THE WITNESS: It's spelled capital A, capital Q,

1 capital T, capital E, s-o-l-v in lower case.

2 MS. JOSEPH-TAYLOR: No wonder Ross wouldn't spell
3 it.

4 THE WITNESS: I'm going to be describing appendix
5 B.

6 Q. (By Mr. De Lipkau) And Exhibit 39.

7 A. The first part of appendix B has water level data
8 from the 206 test and then there are some what are called
9 falling head tests or slug tests and then we move on to long
10 term aquifer tests that we have analyzed.

11 Basically AQTESolv is a program, it's a tool in
12 the program that helps you derive hydraulic properties that
13 transmissivity storage coefficient and so on from data that's
14 generated from wells that are monitored during an aquifer
15 test.

16 What you're basically trying to do is to match a
17 set of type curves of known hydraulic properties. Those
18 hydraulic properties define the shape of the curve to your
19 field data. When you have minimized the difference between
20 your field data and that type curve you can have good
21 confidence that the hydraulic properties that define that
22 type curve define the hydrogeologic conditions that your well
23 has.

24 Q. And is the AQTESolv method utilized in Exhibit
25 39?

1 A. I believe it appears in appendix E -- B.

2 Q. Appendix B.

3 A. Okay. Would you mind if I reviewed it?

4 Q. No. Absolutely not.

5 A. Okay. I'm familiar with this.

6 Q. Now, would it be a true statement that AQTEsolv
7 requires the influent of known pumping tests and known
8 transmissivity and storativity coefficients?

9 A. That is correct. What is shown in appendix B is
10 once you have satisfactory bits of a known type curve and
11 you're very confident about those coefficients that you
12 derived, you can ask of AQTEsolv now tell me what it's going
13 to be like in ten, 20, 30, 40 years near that location if I
14 continue to pump at whatever rate you choose to input.

15 I believe appendix B takes the hydraulic
16 properties derived from the AQTEsolv analyses that we're
17 doing and it projects them over a long period of time and
18 takes them in to account interference from other wells. It
19 also takes in to account other assuming we have certain
20 deficiencies in well design, in other words what if our
21 pumping well is X percent efficient. And it tries to, it
22 tries to project drawdown throughout the well field. And in
23 doing so we say is it possible given what we've found in the
24 well field to physically produce the amount of water that's
25 needed for the Mount Hope project.

1 Q. And what is the conclusion by running the various
2 factors we've previously discussed in to AQTESolv?

3 A. I haven't reviewed this in a long time. But I
4 believe what we've done is to say that we basically have no
5 problem finding the water that we need. We do propose, I
6 believe, two additional wells in this appendix.

7 Q. Another witness will get in to that issue in more
8 detail. In conclusion, Mr. Childress, are you -- is it your
9 conclusion that the pumping of the annual 11,300 acre-feet
10 annually will have an undetectable or non-detectable effect
11 upon the surface waters of Roberts Mountain?

12 A. I believe that is true for the case of the
13 Roberts Mountains.

14 Q. Okay. And would you also state your opinion as
15 to the effect of pumping the desired 11,300 acre-feet
16 annually upon the well field of Diamond Valley?

17 A. I believe I've already done that and the answer
18 is the same that I don't think there will be an effect or if
19 there is, it's going to be extremely small.

20 MR. DE LIPKAU: That's all the questions I have
21 at this time.

22 HEARING OFFICER WILSON: Thank you. Let's take a
23 short break before we go on to cross and come back at 9:25
24 please.

25 (Recess was taken)

1 HEARING OFFICER WILSON: The State Engineer has
2 asked me to go ahead and -- Oh, let me get us off mute for
3 our audience in the supplemental room.

4 Let me start over. We talked during the break
5 and the State Engineer has asked me to read a statement on
6 the rebuttal motion of Mr. de Lipkau. And we have considered
7 the motion to allow rebuttal and the objections of the
8 protestants or in the alternative request for
9 counter-rebuttal and we would like to adhere to the
10 prehearing order and are reluctant to deviate from that
11 order. However, we are also mindful of the requirements of
12 due process. Therefore, we will place the burden on the
13 parties to demonstrate a need for rebuttal testimony or
14 counter-rebuttal to satisfy the requirements of due process.

15 MR. DE LIPKAU: Thank you very much.

16 HEARING OFFICER WILSON: I'd like to proceed with
17 the cross of Mr. Childress.

18 MS. PETERSON: Thank you.

19 CROSS-EXAMINATION

20 By Ms. Peterson:

21 Q. Mr. Childress, I'm Karen Peterson and I'm the
22 attorney for Eureka County.

23 A. Hello.

24 Q. Hi. Do you have Exhibit 42 in front of you?

25 A. No, I don't.

1 Q. No, not Exhibit 42. I'm sorry. Exhibit 40,
2 Figure 42.

3 A. I do.

4 Q. And I have been trying to locate where Well TXF-2
5 is.

6 A. It's not shown on the map.

7 Q. Okay. Where is that well?

8 A. I would refer you to Figure 10. TXF-2 is located
9 in the Whistler Mountains on the east side of Figure 2 on
10 Figure 10.

11 Q. And are you aware that some of the water right
12 applications that the applicant is proposing to be approved
13 in this proceeding have a point of diversion for that well,
14 TXF-2?

15 A. I'm not familiar with any of the water rights
16 outside of my scope. Perhaps Mr. Smith can address those
17 issues.

18 Q. Okay. And I guess then turning to Figure 42.
19 Are you aware that Application 7717 was sought to be approved
20 in this proceeding as a point of diversion for Well 214?

21 A. I'm not aware of any water rights.

22 Q. And is 214 in the carbonate or close to the
23 carbonate based on your Figure 42?

24 A. It is completed in the carbonate rock.

25 Q. And then you had a series of conclusions in your

1 testimony consisting of the flow in to Roberts Mountains. Do
2 you recall that testimony?

3 A. I do.

4 Q. And are your conclusions consistent with the
5 model that, the model results?

6 A. This is field data and fact. Perhaps you should
7 ask that question the other way around, is the model
8 consistent with this. So I'm going to give that one to
9 Mr. Smith.

10 Q. And are you aware -- Well, are you an author of
11 Exhibit 39?

12 A. I wrote much of Exhibit 39. Mr. Smith handled
13 the ins and outs of the model. But as far as the geology
14 section and the chemistry section, I would be the author.

15 Q. Are you aware that the model shows flow from
16 between Roberts Mountains and the well field?

17 A. Any questions related to the model I would send
18 to Mr. Smith.

19 Q. You talked a lot about data from the northern
20 part of your well field, proposed well field; is that
21 correct?

22 A. I did.

23 Q. But you haven't drilled any of the wells yet in
24 the southern portion of the proposed well field, have you?

25 A. If we refer to Figure 10, what's shown on here is

1 there's a purple symbol, the Kobeh Valley well field area.
2 And we stated before, and I don't remember what page it is,
3 but this is a very, very generalized area where we have
4 looked before or were originally exploring for water. The
5 main production wells will be along the corridor. And so
6 yes, we certainly have explored south of the extreme northern
7 part, particularly Wells 222 and 223.

8 The southern part of that area was explored
9 previously by KV 11 201 and KV 05. We have no intent of
10 going any further south of that to my knowledge.

11 Q. Do you even know what the wells are that are
12 planned for the well field production? Because they're not
13 shown on Figure 10.

14 A. It's not the intent of Figure 10. The intent of
15 Figure 10 is to show where test and monitor wells are. It's
16 my understanding that any additional wells would be along the
17 corridor that's shown on the figure.

18 Q. Right. But you don't know what their numbers are
19 and you don't know where they're located. Is that fair?

20 A. Sure.

21 Q. Are you aware of -- And so those questions would
22 be better directed to Mr. Smith?

23 A. They would. And I believe they're addressed by
24 Exhibit 39, not Exhibit 40.

25 Q. Right. Well, are you aware of the ten proposed

1 production wells that only five of them have been drilled?

2 A. That looks like a question for Exhibit 39.

3 Q. Okay. Then let me get one more question about
4 Exhibit 39 off the table here. Are you -- You talked about a
5 spring survey and I know that that is appendix E to Exhibit
6 39. Should I ask questions about that to you or to
7 Mr. Smith?

8 A. I would give those to Mr. Smith. I'm providing
9 testimony on Exhibit 40 predominantly.

10 Q. Okay. Are you aware of the results of mineral
11 exploration drilling in Kobeh Valley northwest of Lone
12 Mountain where there were artesian flows of greater than a
13 thousand gallons per minute encountered in carbonate rocks?

14 A. I've heard hearsay but I don't know that those
15 numbers have actually been physically quantified, i.e., how
16 were they measured, how long do they flow at those rates.
17 It's not uncommon for deep drilling to have artesian flows
18 that are very high for a short period of time that flow drops
19 off overtime. That's something that's seen in a lot of deep
20 drilling and even in petroleum drilling. It's not something
21 that's surprising.

22 Q. High flowing carbonate rocks northwest of Lone
23 Mountain is not surprising to you?

24 A. No.

25 MS. PETERSON: I don't have any further

1 questions.

2 HEARING OFFICER WILSON: Ms. Ure, go ahead.

3 CROSS-EXAMINATION

4 By Ms. Ure:

5 Q. Good morning, Mr. Childress.

6 A. Good morning.

7 Q. I just have a couple of questions for you. On
8 page 48 you complete an analysis of Well 206?

9 A. Give me just one moment, please. I do.

10 Q. Do you know what the drawdown -- Okay. Assuming
11 that the 14,000 gallons per minute were to be continuously
12 pumped for 44 years, do you know what the drawdown amount
13 would be?

14 MR. DE LIPKAU: I'm going to have to object to
15 that question. I think the volume pumped is 7,000 gallons
16 per minute.

17 HEARING OFFICER WILSON: Did you check your
18 question? Do you know the number?

19 MS. PETERSON: I wasn't listening. I'm sorry.

20 HEARING OFFICER WILSON: His objection was he
21 thinks she misstated the number I believe is Mr. de Lipkau's
22 objection.

23 MR. DE LIPKAU: Please read the question back.

24 HEARING OFFICER WILSON: Could you go ahead and
25 go back to Ms. Ure's question.

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(Question was read back)

MS. URE: Okay. I'd like to change that to 1400.
Sorry.

THE WITNESS: No.

Q. (By Ms. Ure) Okay. And then going back to Figure 42, besides completing your cross-section analysis of the geology for AA prime, BB prime, et cetera, did you perform any actual pump tests dealing with the Roberts Creek horst fault to test the trans -- to test the water movement between Kobeh Valley and the further most eastern edge of Kobeh Valley ?

A. I'm going to answer this the best way that I can. That horst had been previously tested in the 206 test, okay. We did not see any drawdown in the very closely positioned Well 204 and 203. After 31 days of pumping at 1400 gallons a minute which is compelling evidence that you can't propagate drawdown to the east.

MS. URE: Okay. No further questions.

HEARING OFFICER WILSON: Thank you. Redirect.

MR. DE LIPKAU: No questions.

HEARING OFFICER WILSON: Questions of staff?

EXAMINATION

By Mr. Felling:

Q. Good morning, Mr. Childress. A few questions. You had stated earlier that in the well field that it was

1 underlain by vinini and not carbonate; is that correct?

2 A. We do believe that in the very first generation
3 of the model we looked at the geologic map which would be
4 Figure 42. And you know that kind of carbonate rocks in the
5 central portion of the northern part of that figure. And we
6 thought that most of the area south of that would also be
7 underlain by carbonate rocks. From Well 209, 208, which is
8 not shown on Figure 42, 220, 229 and 223 we've continued to
9 hit vinini and have not found any carbonate rock west of the
10 Roberts Creek Road.

11 Q. On your Figure 43 you show that Well 220 did hit
12 carbonate?

13 A. Yes. There is, if you walk out in to that area,
14 the area around Well 220 and even where 208 is shown, there
15 is a highly solidified jasper altered ridge of carbonate
16 rock. And by all accounts, when you look around you think if
17 I drill here we're going to go through miles and miles of
18 carbonate. It turns out that that is only about 20 feet
19 thick and it's probably a tectonic slide. We did penetrate
20 carbonate rocks at, I believe, 960 feet at Well 220. But by
21 no means is -- The basin is -- Well, when I describe the
22 basin being floored by vinini I'm talking about the central
23 part of the basin perhaps like under Well 228. Does that
24 answer your question?

25 Q. In part. So Well 220 did hit carbonate and

1 vinini at 900 feet?

2 A. 960 feet, I believe.

3 Q. And that's within the well corridor; is that
4 right?

5 A. That is true.

6 Q. So those wells, you could choose to drill a well
7 in to the carbonate at that location with the permits that
8 are in front of us; is that correct, the applications?

9 A. You could, yes.

10 Q. The other real question I have goes to the
11 pumping test that you did with well, was it 214-T?

12 A. Yes. That was one of the tests, yes. That would
13 be Figure 20.

14 Q. How about if we look at Figure 45. And how long
15 did you pump that in the pumping test?

16 A. That carbonate block had been previously pumped
17 by Well 206 for 31 days. Well 214-T I believe was pumped for
18 11 days. And we saw multiple boundaries in the 206-T test.

19 Q. Now, you have a -- you've shown us that there's a
20 head difference of about 30 feet between the well that's
21 labeled LRCMW and a whole suite of wells to the south in
22 Roberts Creek; is that correct?

23 A. No, sir. I believe that's 330 feet.

24 Q. Okay. And how deep was that well drilled, LR --
25 What do you call that?

1 A. Lower Roberts Creek monitor well.

2 Q. Lower Roberts Creek monitor well. How deep was
3 that drilled?

4 A. I'm going to refer to the appendicies. It should
5 be the first page of appendix B. That was drilled to 478
6 feet. If I recall, the reason to drill further was not
7 deemed necessary because it was already producing quite a bit
8 of water.

9 Q. Well, where was the water table in that?

10 A. The lower Roberts Creek monitor well?

11 Q. Yes.

12 A. Depth to water is 89 feet and it looks like they
13 started producing water between 225 and 245 feet. The well
14 did not produce water prior to that. All of our drilling was
15 done within, so if it was producing water we would have seen
16 it.

17 Q. So your pumping from Well 214 which is some
18 distance a half mile to the south more or less, and you saw
19 boundary effects, in the lower Roberts Creek monitor well you
20 saw boundary effect?

21 A. No, sir, we saw no drawdown in the lower Roberts
22 Creek. We saw boundary effects in 213, which is adjacent to
23 the fault.

24 Q. Okay. So you've gone from that observation to a
25 conclusion that pumping couldn't, couldn't affect any surface

1 water in all of the Roberts Mountains. We have lots of
2 evidence and testimony that the Roberts Mountain is
3 compartmentalized with many, many compartments probably
4 vertically and stratigraphically. And I'm just wondering how
5 you can take a pumping test just in Roberts Creek and apply
6 those results to the entire Roberts Mountains?

7 A. Okay. We know running along the southern end of
8 the southern Roberts Mountains we have a major basin bounding
9 falls there. On one side of the fault our water levels are
10 330 feet lower, so that basically means that that fault is
11 acting as a hydraulic barrier of boundary to groundwater
12 flow.

13 In the natural system, water is having an
14 extremely hard time moving from the lower Roberts Creek
15 monitor well and the middle Roberts Creek monitor well, an
16 upgradient location to a downgradient location. Water is
17 damming up behind the fault, okay.

18 We pumped Well 214. Most of the wells have very
19 similar drawdown trends except for 213 which was drawing down
20 at a much steeper rate than all the other wells because it
21 was more affected by that boundary. If we can't produce
22 drawdown on one side of the fault from pumping during that
23 pumping test I just don't see how we can affect springs that
24 are a thousand, 2,000 feet higher than these wells.

25 What we're going to be doing, Rick, is basically

1 dewatering the carbonate block that houses 205, 206, 213, 214
2 and 215. Water levels are going to drop in that block. And
3 I would review the 206 pumping test where we saw multiple
4 boundary conditions where we pumped it a very long time and
5 we were more likely to see those boundary conditions. It's
6 defining that carbonate block as compartmentalized as is the
7 surface geology.

8 Q. I don't see a lot of wells outside of Roberts
9 Creek particularly to the west to support that that structure
10 is a barrier to flow over the entire southern boundary of the
11 Roberts Mountains.

12 A. Certainly we don't have as many wells in that
13 location. I think the basic configuration of the southern
14 Roberts Mountains implies that that fault continues to the
15 west. We've got vinini which underlies that portion of the
16 basin which is several thousand feet, pardon me, which may be
17 a thousand feet lower than the vinini above it in the
18 mountain block. So we know that there's a fault there.

19 Q. Well, my point here is that you've taken the
20 results from a relatively short term pumping test in one
21 fixed location, although -- and there's been several tests
22 and you have numerous results, but we're going to go from
23 there to 13,000 acre-feet of pumping for 40 plus years and --

24 A. Not from that carbonate block we're not.

25 Q. From the area directly to the south; is that

1 correct?

2 A. Throughout the well field area, right.

3 Q. And my -- And our concern is is it valid to make
4 that leap from this series of pumping tests to the long term
5 impact throughout the whole region? I see a number of wells
6 in Roberts Creek and the area to the west there's essentially
7 none and in the area to the east I see a couple. And that's
8 in Figure 45. And there may be more wells, but that's all I
9 really see.

10 A. I want to make you aware that on Figure 45 we're
11 only showing hard rock well. 46 would show the basin fill
12 wells. So that may fill in some of the blanks for you as far
13 as where wells are and where they are not.

14 MR. FELLING: I don't have anymore questions.
15 Thanks.

16 THE STATE ENGINEER: I don't have any.

17 HEARING OFFICER WILSON: Thank you,
18 Mr. Childress. You may step down.

19 Do you want to offer any exhibits that
20 Mr. Childress addressed?

21 MR. DE LIPKAU: Yes. We'd like to offer Exhibit
22 40 and 411.

23 HEARING OFFICER WILSON: Let's start with Exhibit
24 411. I believe that's your resume. Any objection to the
25 resume of Jack Childress?

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MS. URE: I have none.

MS. PETERSON: No.

HEARING OFFICER WILSON: Exhibit 411 will be
admitted.

Exhibit 40 is the well field data summary report,
March 8th 2010. Any objection to that report?

MS. PETERSON: No objection.

MS. URE: No.

HEARING OFFICER WILSON: Hearing no objection,
Exhibit 40 will be admitted.

I believe Mr. Smith is next. Go ahead and be
sworn.

(Witness was sworn in)

DWIGHT SMITH

Called as a witness on behalf of the
Applicant, having been first duly sworn,
Was examined and testified as follows:

DIRECT EXAMINATION

By Mr. de Lipkau:

Q. Would you please state your name.

A. Dwight Smith.

Q. What is your business address?

A. It's the same as Jack Childress. Interflow

1 Hydrology in Truckee, California.

2 Q. Would you please state the address for the
3 record.

4 A. 11045 Donner Pass Road, Suite 2-A, Truckee,
5 California.

6 Q. Have you ever appeared before the Nevada State
7 Engineer as an expert witness before?

8 A. Yes, I have.

9 MR. DE LIPKAU: At this time I'd like to have the
10 State Engineer qualify Dwight Smith as an expert in the field
11 of hydrogeology or hydrology in the same fashion as the State
12 Engineer did at the October 2008 hearing.

13 HEARING OFFICER WILSON: Will there be any
14 objection to Mr. Smith being qualified as, and I believe in a
15 previous hearing I've written down that we qualified him in
16 groundwater hydrology and groundwater modeling.
17 Hydrogeology.

18 MS. PETERSON: So could you clarify again.

19 HEARING OFFICER WILSON: Hydrogeology and
20 groundwater modeling. Is that sufficient, Mr. De Lipkau?

21 MR. DE LIPKAU: That would be sufficient.

22 MS. PETERSON: Are you offering him today for
23 groundwater modeling?

24 MR. DE LIPKAU: And as a hydrologist. In the
25 same fashion as he was introduced and allowed to testify as

1 an expert in those two fields in October of 2008.

2 MS. PETERSON: Are those the two fields in 2008?

3 HEARING OFFICER WILSON: The two fields were
4 hydrogeology and groundwater modeling.

5 MS. PETERSON: There's no objection.

6 MS. URE: No objection.

7 MR. DE LIPKAU: Thank you.

8 HEARING OFFICER WILSON: You'll be so qualified,
9 Mr. Smith.

10 Q. (By Mr. de Lipkau) Mr. Smith, you have before
11 you a certain report prepared for Eureka model; is that
12 correct?

13 A. That's correct.

14 Q. How long have you been working on the Eureka
15 model project?

16 A. Since February of 2007.

17 Q. It's been four years now?

18 A. That's correct.

19 Q. And during that four-year period -- pardon me --
20 three and a half year period what have been your duties?

21 A. I have been one of the lead hydrogeologists and
22 part of a rather large team of hydrogeologists and water
23 resource specialists. I have had direct responsibilities for
24 the regional flow model development and have also had input
25 to, technical input to just about all facets of data

1 collection and evaluation efforts associated with water
2 development for the project.

3 Q. During that more than three-and-a-half-year
4 period of time approximately what percent of your time has
5 been spent on the Mount Hope project?

6 A. For me personally it has been over 50 percent of
7 my time consistently over the two-and-a-half-year period.

8 Q. Okay. You testified at the October 2008 hearing,
9 did you not?

10 A. Yes.

11 Q. Did you review your testimony?

12 A. I did.

13 Q. And would you like to make any changes to that
14 testimony?

15 A. No changes. However, there will be a number of
16 updates to that testimony presented today.

17 Q. What have you done by way of your professional
18 services since October of 2008 until completion of what we'll
19 refer to as the 2010 model?

20 A. Well, one of the main efforts has been working
21 through the supporting technical documents for the
22 environmental impact statement that's being developed for the
23 project. So there has been a number of different supporting
24 studies. Mr. Childress testified as to the updated
25 exploration drilling. There's been other studies,

1 hydrogeologic studies around the pit area, baseline surveys
2 of spring streams, many other studies.

3 But primarily I've been involved with working
4 through the technical supporting documents for the EIS for
5 the water resources developing portions of --

6 Q. When you say EIS what does that mean?

7 A. The environmental impact statement.

8 Q. And with what agency will that be filed?

9 A. The BLM.

10 Q. The BLM is of course the permitting agency as
11 required by applicable federal law?

12 A. As Mr. Rogers testified to.

13 Q. We want to make certain that we use acronyms we
14 know what we're talking about, okay.

15 A. Yes.

16 Q. All right. So would you please continue. What
17 have you done since 2008 for development of Exhibit 39?

18 A. Mr. Rogers presented a table that went through
19 the review process that we've been working our way through on
20 this modeling effort. And it's been through multiple
21 iterations. If I recall Mr. Rogers' table, there had been
22 six iterations, formal submittals of this work throughout the
23 past.

24 Q. What does an iriditation --

25 A. Excuse me.

1 Q. You used the word iriditation?

2 A. Iteration.

3 Q. Iteration. What does that word mean?

4 A. We started with actually the first report that we
5 developed describing the numeric flow model and hydrogeologic
6 frame work was actually in October of 2007. It was prior to
7 the State Engineer's document in June of 2008. That body of
8 work has been submitted to the BLM, Bureau of Land
9 Management, and the cooperating agencies, primarily Eureka
10 County for review and comment.

11 We then compiled comment, reviewed all comments
12 carefully and worked through how we're going to address
13 comments both from the BLM and from the third party
14 consultant, from Eureka County as a stakeholder. And we
15 worked through how we're going to address those comments and
16 produce an updated draft of the report. So I mention
17 numerous iterations, it's been through this phase of
18 submitting a draft document, getting all of the feedback from
19 the reviewing agencies and then addressing those in an
20 updated version of the model and the report.

21 Q. What goes in to a model?

22 A. Well, numeric flow model is basically a
23 mathematical representation of a flow system. So by
24 definition it's always an approximation and it's always a
25 simplification of actual conditions that exist in the

1 environment. But our attempt is to try to mathematically
2 represent the flow system.

3 Q. Okay. Is a numerical flow model the only means
4 of determining the effect caused by groundwater pumping?

5 A. What we can derive out of a mathematical model is
6 a prediction of drawdown. You then have to if you're going
7 to associate drawdown impacts a lot of time there's
8 additional steps that need to be taken to understand the
9 drawdown has an impact and I think we'll have more discussion
10 on that.

11 There are certainly other estimates, more methods
12 for estimating drawdowns over time in the different
13 locations. There's analytical type models for equations such
14 as was discussed briefly by Mr. Childress using a Theis type
15 solution.

16 And there are also I would call methodologies
17 that are more water budget and perennial yield hydrogeologic
18 frame recordings.

19 Q. Would that be more like the Terry Katzer method?

20 A. That's correct.

21 Q. Or the Andy and Tom Buco method?

22 A. Yes. They both viewed prepared professional
23 judgements on sustainability of water resource development
24 and potential impacts based on their assessment of both
25 hydrogeologic frame work and the water budget and perennial

1 yield.

2 Q. Okay. You touched upon earlier that certain
3 meetings were held between you and others regarding creation
4 of the numerical model. I've just handed you Exhibit 33
5 discussed yesterday by Mr. Pat Rogers. Have you seen Exhibit
6 33 before?

7 A. Yes, I have.

8 Q. Could you please briefly go through and describe
9 the meetings and who was at such meetings in preparation of
10 Exhibit 39?

11 A. You're referring to meetings specifically?

12 Q. Meetings or contacts or exchange of data.

13 A. There is a -- Well, actually the exchange of data
14 takes us back to Table A and that's the actual formal
15 submittals of both the model and the written documentation.
16 And then there's also a listing there of the formal response
17 back. We received written response back from each of the
18 agencies, the BLM, Eureka County and the third party
19 consultant preparing the EIS.

20 Q. Let's stop right there. What parties as you just
21 named were involved or added to or subtracted from Exhibit
22 39? The county? You have Eureka County was present at these
23 meetings?

24 A. I was referring to Table A which was formal
25 submittals of data.

1 Q. Right.

2 A. Table B goes through a summary of meetings that
3 have taken place to discuss updates to the model, how we may
4 handle various comments as a group and those are summarized
5 starting in March 3rd of 2009 through May 26th of 2010 and
6 there are six meetings there.

7 You'll note also that one of these meetings looks
8 like it's to the NEPA stakeholder committee also. So we did
9 occasionally provide updates to that group.

10 Q. What does NEPA mean?

11 A. National Environmental Policy Act. It's what
12 governs the environmental compliance, the BLM.

13 Q. You said NEPA committee. What is the NEPA
14 committee?

15 A. I believe Mr. Rogers testified some to that. But
16 it's a -- And I don't know how that committee is established.
17 But it's representing the local stakeholders so that they
18 have a voice and input to the NEPA process.

19 Q. I believe you testified earlier that the BLM took
20 part in these meetings.

21 A. You'll note that four of the six were to BLM and
22 stakeholders.

23 Q. Was Eureka County or its representatives present?

24 A. Yes. To my recollection they were present at,
25 the technical consultants were present at these meetings.

1 Q. All right. You mentioned earlier the outside BLM
2 consultant; is that correct?

3 A. That's correct. For this project,
4 Enviro-Sciences is responsible for drafting the
5 environmental -- the EIS document on behalf of BLM. They
6 have a subconsultant, Hydrologic Consultants, Inc. They've
7 had an acquisition and name change but that's their older
8 name. Consulting firm out of Denver. And in particular, Dr.
9 Dan Stone was the technical reviewer throughout the duration
10 of the EIS submittal and comment period.

11 Q. Would it be a correct statement that Exhibit 39
12 was a compilation of thoughts and ideas by all of the members
13 you just discussed?

14 A. That is true. There are comments from all
15 parties incorporated in to this current body of work.

16 Q. Okay. In your opinion was Eureka County fully
17 apprised of the progress of Exhibit 39?

18 A. In my opinion, yes.

19 Q. Did Eureka County submit written comments?

20 A. Yes, they do to each of our formal submittals and
21 request for review.

22 Q. Are all or a portion of Eureka County's comments
23 adopted and included within Exhibit 39?

24 A. All comments were carefully considered. Not all
25 comments are incorporated in this document. And you'll see

1 in the county's review and in their submittals that they
2 still have -- we still have some differences but these have
3 been vented through the review process with the stakeholders.

4 On many occasions it was not our decision on
5 whether to accept or reject a comment. We really had to look
6 to the BLM and they relied heavily upon their third party
7 consultant, Dr. Dan Stone, for advice. And I will try to
8 shed some clarity on that when I go through their memorandum
9 regarding our current effort.

10 Q. And subsequent to submittal, the BLM did in fact
11 improve the model, Exhibit 39?

12 A. That's correct.

13 Q. And that's Exhibit 36. I'd now like to direct
14 your attention to Exhibit 402. Do you see -- Have you seen
15 Exhibit 402 before?

16 A. Yes, I have.

17 Q. When is it dated?

18 A. May 28th 2010.

19 Q. By whom was it authored?

20 A. By Carol Oberholtzer and Dale Bugenig.

21 Q. Okay. We will state that Exhibit 402 speaks for
22 itself. Have you ever -- You have appeared before the State
23 Engineer's hearing panel such as this many times before, have
24 you not?

25 A. This is my 11th occasion to testify before the

1 State Engineer.

2 MS. JOSEPH-TAYLOR: You look so excited.

3 Q. (By Mr. de Lipkau) And during those 11
4 appearances have you always relied upon a numerical flow
5 model?

6 A. No, I have not.

7 Q. Have you ever used the analytical method as
8 previously testified to by Mr. Katzer?

9 A. Mr. Katzer being a water budget perennial yield
10 hydrogeologic frame work concept, yes, we have utilized that
11 on some occasions.

12 Q. Have you ever utilized the method utilized by Tom
13 Bugo?

14 A. Yes. And that would be more of an analytical
15 solution to projecting drawdown over time such as the Theis
16 method, and yes, I have.

17 Q. Have you ever used the AQTEsolv method?

18 A. I have some, but Mr. Childress is my expert in
19 running that software.

20 Q. And you of course have appeared before the State
21 Engineer with numerical flow models?

22 A. That's correct.

23 Q. So these are -- What you have just testified
24 then, there are at least four methods of determining the
25 effect of groundwater pumping; is that correct?

1 A. That's correct, based on the different approaches
2 that you've just described.

3 Q. Could a flow model correctly be depicted as a
4 predictive tool?

5 A. That's correct.

6 Q. Isn't it true that a numerical flow model is only
7 one of many tools available to determine effect of
8 groundwater pumping?

9 A. Yes. As we just outlined, there are other
10 approaches to describing that.

11 Q. Let's open Exhibit 39, would you, please. Are
12 there changes between the 2010 numerical model and the 2008
13 numerical model?

14 A. Yes, there are a number of changes, all of which
15 I view as being improvements to the model.

16 Q. What are the improvements? Besides more data
17 please describe the more data.

18 A. I'll try to touch just on some of the primary
19 changes that you'll note if you were to compare the Exhibit
20 116, 2008 document of the numerical flow modeling versus
21 Exhibit 39 before us today. And those are outlined in
22 chapter four. This report you'll notice is significantly
23 revised as far as format over Exhibit 116.

24 However, I would like to note that chapters five
25 through 11 in Exhibit 116 basically constitute now chapter

1 three. And you'll find much of the same information with
2 some additional updated information on spring flow
3 measurements or aquifer properties for material types. But
4 otherwise, chapter three contains similar information.

5 Q. I'm sorry to interrupt. But for the record you
6 refer to Exhibit 115 and 115 was the flow model introduced at
7 the 2008 hearing?

8 A. 116 is what I meant.

9 Q. 116. At the 2008 hearing?

10 A. That's correct.

11 Q. All right. Please continue.

12 A. Okay. So chapter four now encompasses both the
13 regional model documentation and what we call the local model
14 documentation. The local model is an imbedded finer detail
15 model around the pit. And if you recall in the 2008 hearing
16 those were separate documents. Dr. Mark Thomasson with
17 Montgomery and Associates provided some testimony on the
18 local model.

19 These efforts have been combined in to one
20 document collaboratively. A lot of work interactively with
21 the Montgomery Group down in Tucson because there's a lot of
22 inputs and outputs that are common now between the two
23 models.

24 Chapter 41 goes through the developments and
25 calibration of the regional flow model. Mr. Childress gave

1 an overview of the additional hydrogeologic work and the
2 additional geological interpretations in the well fill. That
3 effort -- Those efforts provide a substantial amount of new
4 information and data which was incorporated in to the
5 regional flow model in increments. But primarily the winter
6 of last year there was some major updates in the well field
7 area as a result of additional data collection.

8 Q. My thought in this additional well field data,
9 how did that improve upon if that's the correct word in
10 Exhibit 39. What's it based on?

11 A. The improvements?

12 Q. Yes.

13 A. Okay. I'll kind of go through some of the major
14 areas where we've been able to better constrain the regional
15 flow model. So when I say improve the model I feel like
16 we've either improved the calibration or the fit of the model
17 or we're able to now better constrain the hydrologic
18 properties that were assigned to the model where we have test
19 data. So there are two areas in the regional flow model
20 where we have improved understanding of the hydrogeologic
21 parameters based on ACTESolv and also more detailed geologic
22 mapping. One of those areas is in the well fill area and the
23 other is at Mount Hope.

24 So Mr. Childress mentioned that now we believe
25 the globin structure along lower Robbins Creek where a lot of

1 our wells are situated is floored in, with vinini clastic,
2 sedimentary rocks rather than limestone rocks. That is one
3 change.

4 There has been a lot of subtle refinements to the
5 geology represented in the well field area to strive to more
6 accurately represent the transmissivity that we documented
7 during testing, storage coefficients that we were able to
8 establish during testing. We have additional water level
9 targets. We consider all the system to be in steady state.
10 So this additional drilling and --

11 Q. Excuse me. What does steady state mean?

12 A. Steady state means that there are no, currently
13 no influences, measurable influences of pumping being
14 detected and affecting waters levels in the well field area.

15 Q. Please continue.

16 A. Mr. Childress referenced the fault at the base of
17 the Roberts Mountains, that we think our data supports pretty
18 firmly. There is a fault barrier conditioned there. We now
19 have that represented the model. I'll describe that in a
20 little more detail. It's not an impermeable fault but it is
21 a low permeability barrier to flow.

22 Another aspect that we were able to gain in the
23 well field area is we have six tests, three in alluvial
24 basin-filled deposits and three in carbonate rock environment
25 that lasts in duration from five to 31 days. We made what I

1 will call transient tests in the model and used the responses
2 observed in that testing to further refine the calibration of
3 the reading the model. There are also some clarifications
4 there because the bed size in the regional model at its
5 finest is 1,000 foot square. And we have some limitations
6 there just in representing the very subtle complexities of
7 the system. But in large we wanted to be able to capture the
8 drawdown effects that we observed in the testing. And we
9 have reasonably replicated those in the model.

10 I'm going to refer to just a few figures for
11 clarity. The six tests that are provided some hydraulic
12 constraints to the aquifer properties --

13 Q. Excuse me, Mr. Smith. Would you please refer to
14 the page or figure number to which you are referring.

15 A. Yes, yes, I will. Those six locations are shown
16 on Figure 3.6-1.

17 Q. Which volume?

18 A. This is all from Exhibit 39.

19 MS. JOSEPH-TAYLOR: Volume one or volume two?

20 THE WITNESS: All the figures are in volume two.
21 All the text and tables are in volume one.

22 While we utilized aquifer testing characteristics
23 wherever we had data available, the six wells that are all of
24 this, 214-T, 216-T, 229-T, 222-T, 220-T and 228-T provide an
25 important constraint in the well field area and also allowed

1 us to do some transit testing in the model area.

2 I'd like to refer to Figure 4.1-6 in Exhibit 39.

3 In the center of this figure cutting diagonally in a
4 northeast to southwest direction through the M in the Mount
5 Hope label, you'll note what is labeled as a hydrologic flow
6 barrier. It's a fault that Mr. Childress has referenced in
7 his testimony from Exhibit 40. That fault obviously is
8 important and when it comes to predicting long term drawdown
9 and the extent of potential drawdown that could propagate in
10 to the Roberts Mountains.

11 In the vicinity of Mount Hope, if you were to
12 carefully compare the hydro -- the hydraulic conductivity
13 distribution in the model from the 2008 version to the
14 current version you'll notice refinements in that area.

15 And I would like to point to Figure 4.2-3 on
16 Exhibit 39. Mr. Childress gave an overview of the drilling
17 and testing work done in the well field area where currently
18 there has been a very extensive drilling and testing program
19 undertaken in the pit area also. And that included deep
20 drilling to get hydraulic properties at the base elevation of
21 the pit 3,000 feet in depth. It's included aquifer testing
22 with additional observation wells drilled to support aquifer
23 testing around the pit area. It's included updated
24 potentiometric water levels, updated geologic mapping,
25 updated geologic cross-sections. There's been a lot of work

1 which is summarized.

2 But just so you understand the magnitude of the
3 effort that's been going on, it's been equally impressive up
4 at the pit to generate actual data to help us constrain our
5 modeling effort.

6 The difference, the regional model derives
7 information from the local model. The dewatering and then
8 evaporation rates coming off the pit lake derived from the
9 local model. And those are input in to the regional model
10 and the calibrated hydraulic properties in the local model
11 area. Also there is -- there has been significant efforts
12 for the regional model reasonably represent the local model
13 hydraulic conductivities. And I say reasonable, the local
14 model has 100 times the horizontal resolution of the regional
15 model.

16 Q. What does that mean?

17 A. The local model grid sides in the pit area is 100
18 feet square, whereas it's a thousand feet square in the
19 regional model.

20 Q. Okay.

21 A. So you can never exactly replicate the degree of
22 detail done on the local model, but there's steps to do that
23 as well as we can. The pit dewatering rates -- Oh, I should
24 mention also in reference to Figure 42-25, that is a plot of
25 simulated versus observed water levels for the local model

1 and the calibration on that model is now quite good. It's
2 certainly improved over the version that was presented to the
3 State Engineer in 2008.

4 Q. Could you please describe this pump test or
5 exhibit with a little more detail.

6 A. This is a plot of simulated water levels on the Y
7 and observed or measured water levels on the X. These are
8 considered steady state or static water levels. These are
9 the calibration targets for water levels for the local model.
10 When I say calibration, the model is -- can be viewed as a
11 regional stacking of blocks or cells and we adjust the
12 hydraulic properties in every cell in the model and we also
13 adjust the inputs of flow and the parameters that control the
14 outfits. So our attempt is then what constrains this process
15 and matching as best we can water levels distributed
16 throughout the model.

17 So this is -- One of the ways we judge the
18 ability of a model to reasonably replicate the physical
19 system or trying to model. And ideally you would have every
20 point falling on a perfect 45 degree line. But you can see
21 the degree of offset is mild. And I consider that to be a
22 very good fit to the actual data.

23 Q. Does that mean the model is calibrated properly
24 or accurately?

25 A. It means to me that the model is sufficiently

1 calibrated to be used now as a tool to go forward with making
2 predictions.

3 Q. Okay. Please continue.

4 A. Likewise, the local model also we had aquifer
5 testing data in attempts to match the short term transient
6 data. So dual step calibration in both of these model
7 efforts where we used the transient testing data also to help
8 further constrain calibration.

9 I want to draw your attention to the, if I can
10 find it, the simulated dewatering rates now for the pit.
11 Here we go. So the updated predictions of dewatering rates
12 for the 32-year active mining --

13 Q. Would you please tell us the exhibit number or
14 figure.

15 A. Sorry. It is shown is Figure 4.5-7. And the
16 projected -- Oh, excuse me. I stepped ahead. I stepped
17 ahead there. Sorry about that. We'll continue with this.
18 So there's two parts to, probably of interest to the state as
19 far as results out of the local model. One is the dewatering
20 rates. And I haven't pulled up the right figure for that.
21 But the values are up to a maximum of 460 gallons per minute.
22 And actually I recall now that's shown on a table, I believe.
23 Table 4.5-1 lists the predicted dewatering rates derived in
24 the updated local model. And these are average annual flow
25 rates. Flow rates could vary as the mine pit progresses and

1 fractions are encountered. It's envisioned still to be a
2 sump operation. The maximum annual average inflows is
3 estimated at 460 gallons a minutes. That compares with an
4 estimated average annual maximum of 709 gallons a minute in
5 the 2008 model. So our dewatering rates with the refinements
6 and additional data collection efforts have decreased some.
7 These rates are represented in the regional flow model.

8 Q. Let me stop you right there, Mr. Smith. Does
9 your testimony include the inflow of Diamond Valley water
10 during pumping or during mining or was it at the completion
11 of mining?

12 A. The rates presented in table, let me find it
13 again here, 451, those rates are -- represent inflow from all
14 around the pit including Diamond Valley and Kobeh Valley.
15 The pit is situated on the crest of the water shed divide.
16 Approximately 80 percent of the pit is in the Diamond Valley
17 hydrographic basin. Approximately 20 percent is in Kobeh
18 Valley. So of the 460 gallon per minute rate depicted as a
19 maximum annual, just ballpark, we would assign round numbers,
20 three-quarters or 80 percent of that inflow from Diamond
21 Valley hydrographic basin, 20 percent from Kobeh. That's a
22 ballpark estimate.

23 Q. And you are aware that the applicant has more
24 than that volume of water transferred to or previously
25 permitted to the Diamond Valley side; is that correct?

1 A. That's correct. After mining of ore in the pit
2 ceases, pumping of water in the pit will cease and a pit lake
3 will start to develop.

4 Figure 4.5-7, one of the traces here it looks
5 orange or red to me, it's a solid line, is the predicted
6 groundwater inflow to the pit over time. And on the
7 left-hand side is the rate in gallons per minute. The X axis
8 on the bottom is the elapsed time in years. And you can see
9 that it does take a long time, hundreds of years, to reach an
10 equilibrated system around the Pit Lake. The predicted
11 groundwater inflow rate is approximately 100 gallons per
12 minute. This compares with a steady state strict inflow rate
13 at Pit Lake calibration of 185 gallons a minute in the 2008
14 model. So again, it's a reduced number.

15 Q. And again there are adequate water rights to
16 cover the approximately 100 gallons per minute inflow after
17 cessation of mining?

18 A. That's correct. So these values are also input
19 in to the regional flow model as part of the update.

20 A few other areas where there's been changes of
21 note, how springs are stimulated in the model has been
22 updated some, in part, I believe, to Mr. Felling's comments
23 in our hearing in 2008 but also in part to other offered from
24 the BLM and third party consultant and Eureka County.

25 Five of the regional springs are springs where we

1 have historic measurements of flow over time are now
2 represented using head dependent flow boundary. It's a drain
3 cell is what we call it in the MODFLOW. Those would be a
4 Tonkin Spring, Shipley Spring, Thompson Spring.

5 Q. Excuse me. What exhibit are you referring to?

6 A. I'm sorry. I'm looking at now at Figure 3.4-8.

7 Q. Okay.

8 A. The Figure 3.4-8 doesn't show all the springs I'm
9 going to list. But let's keep that open for a minute if we
10 may. All the springs that I'm mentioning, however, are
11 illustrated on Figure 4.1-6. So Tonkin Spring, Shipley Hot
12 Spring, Thompson Spring, Hot Spring Hill and Kobeh Valley and
13 the Bartine Ranch flowing wells are now representing using
14 head dependent flux or boundary conditions.

15 So basically what that means is the
16 potentiometric -- These springs are represented as a drain
17 cell placed at depth between layers three down to six. So
18 anywhere from several hundred to a thousand feet in depth in
19 the model. And the amount of water that's taken out of that
20 drain cell is dependent on the potentiometric head. And we
21 adjust the conductance in that cell so we have a reasonable
22 match with the steady state flow that we've reserved at these
23 springs.

24 And for -- That gives us the -- That gives us an
25 improved predictive capability to look at potential impacts

1 to flow derived from those springs.

2 Also you'll note on Figure 3.4-8 another area
3 where we've added representation of spring to the model is on
4 the south end of the Diamond Valley playa. And from a seven
5 and a half minute topographic map published in the 1980 or
6 early '80s time frame there are over 50 map springs on the
7 south end of the playa.

8 From our observation in the field, these springs
9 have effectively dried up. It was very wet conditions down
10 around Sulfur Springs and there was maps of meadows and
11 tooles in that area, flowing artesian wells, a number of
12 those are noted with the blue, multi-shaded blue-colored
13 symbols. Those would be sources that cease to flow today as
14 does Thompson Spring on the west side of Diamond Valley has
15 ceased to flow since we believe the 1990s. And I personally
16 observed water level at the main spring flow at 6.1 feet
17 below the rim in 2007 I believe at Thompson Spring. So that
18 we felt was a condition of daylighting of the water table,
19 very shallow water table conditions. We felt like that
20 should be represented in the model. That did to some degree
21 alleviate flooding cell conditions on the south end of the
22 playa, which was the topic of discussion in the last hearing.
23 We'll talk a little bit more about flooded cell issues. All
24 of the spring flows are routed back to layer one.

25 Q. Are what?

1 A. Are routed, the flows are routed from the layer
2 that we have removed them from, anywhere from layers three to
3 six back up to layer one.

4 Q. One is the top?

5 A. Yeah. There are eight layers in the numeric flow
6 model. Layer one is the land surface down to approximately
7 50 feet in depth or greater. So it's representing the
8 shallowest water table conditions.

9 So all the spring flow routed back up to layer
10 one and the same quantities or approximately full quantity to
11 what they're being simulated to be produced from depth. That
12 allows them the ability to then feed ET, evapotranspiration,
13 at the surface. We're trying to have a complete accounting
14 of the water cycle that we're trying to represent in the
15 model.

16 There are two exceptions. And at Tonkin Spring
17 we decided that routing that water back to layer one was not
18 appropriate because we have allocated that discharge from
19 Tonkin Spring, which is the major source of water to the main
20 creek. We have allocated that as recharge as the flow in to
21 Denay Creek progresses down and out in to the valley floor.
22 So we thought it would be inappropriate to reroute that back
23 there to layer one when the counting that source is recharge
24 further down in the system.

25 And as I've described near the playa, those drain

1 cells actually represent the water table conditions from
2 layer one.

3 Q. Excuse me. When you say playa, where on Figure
4 3.4-8?

5 A. The playa is the light-colored surface in the
6 upper right-hand corner of Figure 3.4-8.

7 Q. Okay. Thank you.

8 A. So that is spring modifications and improvements
9 that were made to the model.

10 On recharge distribution, there's been some
11 refinements to recharge distribution in the model and also
12 some refinements to mountain block hydraulic conductivities
13 in response to trying to minimize the condition of flooded
14 cells in the mountain blocks. And flooded cell for clarity
15 is when the water level in my layer one cell when the
16 predicted water level is above the top of the cell, it's
17 loose terminology but we call that a flooded cell. Now, that
18 does not mean that there is actual pooled water on top of the
19 cell, because the type of layer, layering that we've used
20 converts to a confined cell when the water level reaches the
21 top of the cell. So when the water level is below the top of
22 the cell, the flow equations are unconfined. When the water
23 level exceeds the top of the cell, it is simply representing
24 an artesian or confined condition. That's all that it's
25 representing.

1 There are "flooded cells" in every model, in all
2 layers of the model because they're confined conditions
3 representing in all layers of the model. At some locations,
4 for example, Well 152 north of the pit has an artesian head
5 of, well, a minimum of 25 PSI, 70 feet. So actually what I'm
6 trying to match in or model in both of our models is
7 conditioned where layer one is flooded and the potentiometric
8 head is actually above land surface. That is a real
9 condition on the ground we're trying to represent.

10 In other location that's a similar condition
11 we're trying to represent where the water table is at or near
12 the surface and we have a lot of datelining of the water
13 table at the surface that could be a similar condition.

14 But this version of the model early on we adopted
15 some calibration to try to minimize flooded cells where we
16 really didn't have data to suggest that they do or do not
17 exist in the mountain blocks per se.

18 So the version we have before you today hasn't
19 absolutely resolved eliminated all flood cells. But it is
20 down to less than one percent of the total number of cells in
21 layer one. There are approximately 112,000 active cells in
22 this model. That's the building blocks. Layer one has
23 approximately 14,000 active cells. I believe Ms. Oberholtzer
24 pointed out that the current calibrated model has 127 flooded
25 cells in layer one. The fact is we feel like we've made a

1 good improvement in that area.

2 In regards to evapotranspiration, ET, there were
3 some refinements early on after the State Engineer's hearing
4 in 2008. We basically concurred and adopted maximum ET rates
5 and extinguishing depths for ET that had been reviewed and
6 conveyed to us by Mr. Walker.

7 And so the model today has rates that are
8 constrained and are below the potential evapotranspiration
9 and the extinction depths are 40 feet for shrubs, ten feet
10 for salt grass community meadows, five feet for playa.

11 Q. For what?

12 A. For the playa. I believe that's a fair
13 characterization of the major changes that have -- that
14 you'll observe in this version of the model. There have been
15 a lot of finer refinements and iterations and calibrations.
16 The current calibrated model is improved over the version
17 presented in 2008.

18 Let me refer to a table in this regard. Table
19 4.1-10, summary of steady state regional model calibration
20 statistics. Part of our reporting now is we break out
21 calibration statistics by hydrographic basin.

22 MR. FELLING: Excuse me. What page is that on?

23 THE WITNESS: Oh, this is back in the tables, so
24 no page number. But it's Table 4.1-10. So it's section
25 four, chapter four table.

1 So these are similar reporting of calibration
2 statistics for the model. And I'll just refer to the very,
3 under the second column from the right entire model domain,
4 calibration statistic to the last two residual standard
5 deviation divided by the range is at 2.1 percent and the
6 previous model it was around 2.8 or 2.9 percent. And
7 absolute residual meaning for the range is 1.5 percent,
8 whereas if I recall correctly it was about two percent in the
9 previous model. So calibration has also been improved.

10 And I'd like to refer to a plot of the
11 calibration. So a similar plot is represented in Figure
12 41-25 similar to that presented in for the local model with
13 simulated water levels on the Y axis and observed on the X
14 axis. And again, we feel like we've achieved a pretty good
15 match, a good match.

16 In the steady state model we have approximately
17 180 calibration targets for water level.

18 Another aspect of the model which was also
19 reviewed was the transient calibration for Diamond Valley. I
20 can't say that we really have improved the calibration in
21 Diamond Valley. We certainly have spent a considerable
22 amount of time looking in to the transient conditions in
23 Diamond Valley. Of note, which was described, I believe, in
24 the 2008 hearing is there was a period from the mid-80s to
25 the mid-90s where two data that we have suggests relative

1 reduction or absence of drawdown for a period of time which
2 does not correlate with our records of pumping for the basin
3 which are derived from your office crop inventory data.

4 We know that we had some very wet years
5 especially in 1983 and we attempted to couple a recharge in
6 Diamond Valley to hydrogeologic conditions, various different
7 functions and precipitation, but it did not improve the fit
8 of the model. We could perhaps alleviate some of the, some
9 of that condition, but overall we weren't improving the fit
10 and the reason is because there were other periods within
11 that span of record that we calibrated to, 1956 to 2006, that
12 were quite wet but we didn't see a mild or similar response.
13 Equally there were some very dry conditions but we didn't see
14 an equal or opposite type response in water levels. So
15 absent a real definable tangible explanation for water
16 levels, the actual water level data during that time frame,
17 we basically fell short of trying to improve the model to
18 simulate that.

19 I think first we would have to understand the
20 physical process better and then from that point try to
21 replicate the model. We were trying to test different
22 hypothetical solutions there. And at the end of the day it
23 was not improving the fit of the model. •So we left the
24 recharge as a constant rate throughout that transient
25 simulation period.