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Non-Binding Arbitrations before  
Jeffrey C. Fereday, Arbitrator

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Initiated Pursuant to Final Settlement  
Stipulation

KANSAS v. NEBRASKA & COLORADO  
No. 126, Orig, U.S. Supreme Court  
Decree of May 29, 2003, 538 U.S. 720

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N-CORPE Augmentation Plan  
(Arbitration Initiated July 10, 2013)

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DEPOSITION OF: THOMAS E. RILEY, P.E.

DATE: February 18, 2014

TIME: 11:15 a.m.

PLACE: 1221 N Street, Suite 600, Lincoln,  
Nebraska

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1 APPEARANCES  
2  
3 APPEARING FOR KANSAS:  
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22  
23 ALSO PRESENT:  
24  
25 Jasper Fanning, Marc Groff, James  
Schneider, Brian Dunnigan

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1 I-N-D-E-X  
2  
3 WITNESS Direct  
4 Thomas Riley 4  
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7  
8 EXHIBITS Marked  
9 1. Notice of Deposition 4  
10 2. Responsive Report to Kansas 4  
11 Analysis of the N-CORPE Plan  
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1 PROCEEDINGS  
2 (Exhibit Nos. 1-2 were marked  
3 for identification.)  
4 THOMAS E. RILEY, P.E.,  
5 Being first duly cautioned and solemnly sworn as  
6 hereinafter certified, was examined and  
7 testified as follows:  
8 DIRECT EXAMINATION  
9 BY MR. GRUNEWALD:  
10 Q. Good morning, Mr. Riley.  
11 A. Good morning, Mr. Grunewald.  
12 Q. And how are you doing today?  
13 A. I am quite well. We have nice weather  
14 here for you to drive up to this time, unlike  
15 your other visits, so you missed a golden  
16 opportunity.  
17 Q. I always appreciate the invitation. We  
18 are going to be doing a deposition about your  
19 expert report. Just as a matter of  
20 housekeeping, we should be using two exhibits  
21 here for your deposition and one should be the  
22 deposition notice and the second one should be  
23 your report dated February 7th, 2014. Does the  
24 reporter and do you have copies of those?  
25 A. Yes.

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1 Q. I will do my best not to talk over you,  
2 but please let's make sure we get a good  
3 record. So, Mr. Riley, if you need to jump in  
4 to finish an answer or clarify, please do that.  
5 Does that sound okay?  
6 A. Yes.  
7 Q. Is there any reason that you can't give  
8 complete and truthful answers this morning?  
9 A. No, there's not.  
10 Q. Great. The deposition notice, which is  
11 Exhibit 1, refers to any backup material that  
12 hasn't been previously provided. Is there  
13 anything that falls into that category?  
14 A. No, there's not.  
15 Q. Great. And we can go ahead and go to  
16 Exhibit 2, and that should be your report. Do  
17 you have that in front of you?  
18 A. I have a copy here with me.  
19 Q. Okay. Well, I'll start with some  
20 general questions. What was the role -- your  
21 role or your firm's role in relation to the  
22 N-CORPE Project?  
23 A. So myself and The Flatwater Group would  
24 have provided consulting services to the  
25 N-CORPE Board and to the State of Nebraska.

<p style="text-align: right;">Page 6</p> <p>1 Q. Were there two separate assignments or 2 was it one global assignment for a joint 3 client, if you will? 4 A. They are two separate -- separate 5 pieces, Mr. Grunewald. The report that we have 6 here, I would have done that for the State in 7 support of the arbitration and the N-CORPE Plan 8 that was submitted through the RRCA. My other 9 work was with the -- the N-CORPE Board to help 10 support some of the design and operational 11 components that went into the design of their 12 facility that's being constructed. 13 Q. Great. Well, let's pick those out. 14 And am I right in assuming the second one is 15 the one that -- the assignment that you had 16 first, or were they simultaneous assignments? 17 A. Currently they would be simultaneous, 18 but at first it would have been just for the 19 N-CORPE folks themselves. 20 Q. Great. So when did that assignment 21 start? 22 A. I think -- I don't have an exact date, 23 but late in 2012 would have been the work that 24 was specific to the N-CORPE Project. 25 Q. And that was design work I think you</p>	<p style="text-align: right;">Page 8</p> <p>1 A. We do have some ongoing work with -- I'm 2 sorry. Let me make sure I understood that 3 question. Other than those four or 4 individually with those four? 5 Q. I actually meant the latter. So if you 6 have -- this is my understanding so far. For 7 the N-CORPE Project, you're doing work for the 8 group, we'll call it, I guess the N-CORPE 9 Board, and then it sounded like individually 10 also work for the Twin Platte NRD for the 11 Platte side of this project. Did I get that 12 part right? 13 A. Well, that work would be as their 14 membership to the N-CORPE, so it's work that 15 would be more relevant to their interests but 16 as part of the N-CORPE group. We also have 17 separate work ongoing with the Twin Platte NRD 18 for other projects unrelated to the N-CORPE 19 Project. 20 Q. I see. And do you have other work for 21 any of the other three NRDs that's separate 22 from the N-CORPE Project? 23 A. I don't think currently we have any -- 24 any contracts or work that we're doing that 25 would be individual to the other three NRDs</p>
<p style="text-align: right;">Page 7</p> <p>1 mentioned. Would you characterize it as 2 anything else as part of that work? 3 A. Yes. We're supporting some of the other 4 members. There's four members that comprise 5 the N-CORPE group that are NRDs, the Twin 6 Platte NRD, the Upper Republican NRD, the 7 Middle Republican NRD, and Lower Republican 8 NRD. And so we have some ongoing work for the 9 N-CORPE group as a whole, but also to assist 10 the Twin Platte NRD in assessing how they will 11 potentially use some of the water in the Platte 12 River Basin. 13 Q. Okay. So now do you have -- do you have 14 specific Natural Resources Districts, or NRDs, 15 as clients for this or for anything else? 16 A. For this project, we would be working 17 for the N-CORPE Board, which is through an 18 Interlocal Agreement, an arrangement. And 19 probably Dr. Fanning would be a better person 20 to ask how that's exactly structured. But then 21 we do a variety of projects, The Flatwater 22 Group does, for Natural Resource Districts 23 across the state in Nebraska. 24 Q. And are any of those projects for any of 25 the other of the four NRDs that you mentioned?</p>	<p style="text-align: right;">Page 9</p> <p>1 that we've talked about that comes to mind. 2 Q. Thank you. How was the project size 3 determined? 4 A. The project size for the pipeline or the 5 pumping plant components? What are you talking 6 about, Mr. Grunewald? 7 Q. Well, let's start with the -- start with 8 the pumping, if you're treating those things 9 separately. How was the size of the project in 10 relation to the pumping determined? 11 A. I didn't work on the specific design 12 parameters of how much pumping could be 13 developed out of that particular zone of land, 14 so I don't know if I can answer that question 15 with any detail. 16 Q. What about the pipeline size then, how 17 was that determined? 18 A. So the design engineer, which I'm not 19 familiar with the specifics that actually go 20 into the pipeline design, took this -- the 21 sizing of the well field, which I think that 22 was your first question. The 60,000 acre-feet 23 per year is what that's predicated on. Took 24 that number and was able to calculate through 25 engineering calculations what size and type of</p>

<p style="text-align: right;">Page 10</p> <p>1 pipe would be necessary to have constructed to 2 carry that water. 3 Q. And are you aware of a specific need for 4 the project in terms of a quantity of water 5 delivered that was driving your design work? 6 A. Well, again, I did not do the specific 7 design, but the N-CORPE's development and the 8 NRDs' needs for water -- as I sit here today, I 9 can't really tell you what the limitation on 10 those needs really were that drove that total 11 design number of the 60,000 acre-feet that's 12 referred to in the N-CORPE Plan. 13 Q. Okay. There were -- it sounds like 14 there were two pieces of this, and we talked a 15 the bit about your work for the N-CORPE group. 16 Now, the second piece of it was in reference to 17 the N-CORPE Augmentation Plan and this 18 February 7, 2014 report. I was going to ask 19 you some questions to clarify that. When did 20 that work start? 21 A. Well, the support of the -- the N-CORPE 22 Plan would have -- would have begun with 23 Nebraska's development and submittal to the 24 RRCA of that -- of that plan. So some of those 25 timeframes are almost concurrent in late and</p>	<p style="text-align: right;">Page 12</p> <p>1 constructing a similar type of presentation 2 that would, again, tie into this, in this case, 3 my expert report to present the conditions of 4 the creek and the N-CORPE infrastructure to 5 help people understand where it's at in 6 relation to the river, the same general type of 7 things. 8 Q. So using like a fly-over type of 9 presentation like you did for Rock Creek? 10 A. That's -- that's likely. 11 Q. Are you picking some good music? 12 A. Did you have a specific request that we 13 could consider for that? 14 Q. I appreciate that. I'll give it some 15 thought. If you could turn to page one of your 16 report, I would appreciate it. 17 A. Okay. 18 Q. And there's a Section II, "Medicine 19 Creek Background." Do you see that? 20 A. Yes. 21 Q. And there is a reference in the first 22 paragraph to sandhills and also to -- and I 23 apologize for mispronouncing it, is it loess? 24 A. Well, it depends on who wants to say it. 25 I would say "loess," but I've heard it said</p>
<p style="text-align: right;">Page 11</p> <p>1 early 2012 -- or 2013 then. 2 Q. So you were involved in the development 3 of the submittal of N-CORPE Plan to the RRCA? 4 That was part of your work? 5 A. Well, I certainly would have reviewed it 6 and participated in elements of its 7 construction. The Department of Natural 8 Resources put together the Plan and submitted 9 it to the RRCA, but myself and my firm, The 10 Flatwater Group, would have offered support for 11 elements of that. 12 Q. And you've prepared this report, I'll 13 refer to it as the "Responsive Report to the 14 Kansas Analysis of the N-CORPE Plan." Does 15 this contain all of your responsive expert 16 opinions that will be prepared for this matter? 17 A. I think it does, Mr. Grunewald. I'm 18 just reviewing some of the conclusions and I 19 think that what I suggested in here would be 20 the entirety of my presentation. 21 Q. Are you preparing a video presentation 22 for this like you did for the Rock Creek 23 Augmentation Plan? 24 A. Yes. That little camera behind you is 25 videoing you right now. We are contemplating</p>	<p style="text-align: right;">Page 13</p> <p>1 both ways. It's windblown materials, but 2 "loess." 3 Q. We'll go -- I'll try it. We'll go with 4 "loess." Is that right? 5 A. Yes. 6 Q. What's the significance of the 7 transition between the sandhills and the loess? 8 A. In that setting, I think it was good to 9 point out that the sandhills, that defines 10 where the pumping plant is, the pumping field, 11 and as you come through that, you start to get 12 into the Republican River Valley, which -- and 13 the Medicine Creek has been -- has been cut 14 through some of these loess deposits and over 15 time created that particular creek and its 16 tributaries. 17 So the significance is that there's two 18 primary geographic features that set up how 19 that creek originates. The sandhills, really 20 that's where the aquifer, the Ogallala Aquifer 21 kind of pinches out and some of these base flow 22 conditions start to begin and make their way 23 down the creek and form the Medicine Creek over 24 time. 25 Q. You have a map. On Figure 1, could you</p>

<p style="text-align: right;">Page 14</p> <p>1 flip to that for me?</p> <p>2 A. Yes.</p> <p>3 Q. And I would ask for some assistance on</p> <p>4 the other end of the phone. If someone could</p> <p>5 loan you a pen, I would appreciate if you could</p> <p>6 mark the deposition exhibit version of where</p> <p>7 you think that transition occurred on your map.</p> <p>8 And if you could describe it for me, I would</p> <p>9 very much appreciate it.</p> <p>10 A. Sure. This map doesn't have that kind</p> <p>11 of detail that really allows me to do that with</p> <p>12 a huge amount of confidence, but I'll use a</p> <p>13 wide marker.</p> <p>14 THE WITNESS: Can I use this</p> <p>15 one, Don?</p> <p>16 MR. BLANKENAU: Yeah, that's the</p> <p>17 one I want you to use.</p> <p>18 THE WITNESS: But generally it</p> <p>19 would be in the upper portion of the Basin, so</p> <p>20 on the north side. And really, Mr. Grunewald,</p> <p>21 just to kind of orient you where I'm going to</p> <p>22 kind of make this cut across here, the "N23"</p> <p>23 that you see there, that's a highway. That</p> <p>24 little fine line that's close to where "Project</p> <p>25 Discharge" is noted.</p>	<p style="text-align: right;">Page 16</p> <p>1 little bit about what made it significant in</p> <p>2 terms of the transition between the two</p> <p>3 features. So how can you -- describe for me</p> <p>4 how that affects the seepage characteristics of</p> <p>5 the stream, the difference between the two.</p> <p>6 A. So the footnote that I have in that</p> <p>7 section, what I really wanted to point out is</p> <p>8 the Basin as it's defined for its surface-water</p> <p>9 drainage is somewhere on the order of 900</p> <p>10 square miles and change. And you'll see this</p> <p>11 all over the board, and it depends on what</p> <p>12 basin boundary map you might use to determine</p> <p>13 that. However, when you look in the literature</p> <p>14 and, in fact, information from the Bureau and</p> <p>15 others over the years, many times Medicine</p> <p>16 Creek -- and this is true of other basins on</p> <p>17 the north side of the Republican River -- show</p> <p>18 a much smaller square mile contribution, and so</p> <p>19 I felt it was important just to point that out</p> <p>20 to any reader; that you're going to see a</p> <p>21 discrepancy in some of those reported results.</p> <p>22 And, in fact, if you look at the RRCA</p> <p>23 documentation from the FSS, you'll find that</p> <p>24 the square miles for Medicine Creek I think is</p> <p>25 on the order of 7- or 800 square miles. I</p>
<p style="text-align: right;">Page 15</p> <p>1 Q. (By Mr. Grunewald) I see it.</p> <p>2 A. I'm going to kind of go right through</p> <p>3 there and make that distinction, and I'll label</p> <p>4 the top part "sandhills" on this portion. And</p> <p>5 that's very rough. If we want any more of an</p> <p>6 exact layout of that, a couple of the</p> <p>7 references that I've noted here in my report</p> <p>8 have some good description of those particular</p> <p>9 formations. Let me refer those to you.</p> <p>10 It would be the -- well, actually any</p> <p>11 one of them, but I think probably the -- on</p> <p>12 page five under References of my report, the</p> <p>13 most complete one that I recall would be this</p> <p>14 James Brice from '58. The title of that paper</p> <p>15 is "Origin of Steps on Loess-Mantled Slopes:</p> <p>16 Contributions to General Geology."</p> <p>17 Q. Great. Thank you.</p> <p>18 A. And my recollection is that there's some</p> <p>19 nice maps in there.</p> <p>20 Q. Okay. That's what I was going to</p> <p>21 confirm there. Maps, in that reference, you</p> <p>22 were referring to?</p> <p>23 A. I think that's the one. I don't have</p> <p>24 that in front of me.</p> <p>25 Q. Okay. Thank you. Now, you described a</p>	<p style="text-align: right;">Page 17</p> <p>1 don't have an exact number off the top of my</p> <p>2 head, but that was a point I wanted to make.</p> <p>3 And some people take those -- that smaller</p> <p>4 number because the sandhills don't necessarily</p> <p>5 have much of a surface runoff component.</p> <p>6 Precipitation events that occur in those type</p> <p>7 of areas typically infiltrate quickly and don't</p> <p>8 always have a significant runoff component. So</p> <p>9 sometimes engineers, planners, will in their</p> <p>10 design efforts leave that type of information</p> <p>11 out and call it a noncontributing area.</p> <p>12 Q. Okay. Thank you. If you could turn to</p> <p>13 page two, I would appreciate it. And draw your</p> <p>14 attention to the last paragraph of that section</p> <p>15 in your report. Do you see it?</p> <p>16 A. The last paragraph, Chris?</p> <p>17 Q. Well, it's the first full paragraph on</p> <p>18 page two.</p> <p>19 A. Okay. Yes.</p> <p>20 Q. It references the Rock Creek</p> <p>21 Arbitration. Do you see it?</p> <p>22 A. Yes.</p> <p>23 Q. And in that paragraph, you note that</p> <p>24 "the physical characteristics and setting of</p> <p>25 this stream is analogous to Rock Creek" and I</p>

<p style="text-align: right;">Page 18</p> <p>1 wanted to understand, what did you think was 2 analogous between the two? 3 A. So the settings for the well fields for 4 both the N-CORPE Project and Rock Creek, those 5 are generally located in the sandhills, or are 6 sandhill type of formations where there's deep 7 aquifers. There's a very thick saturated zone. 8 So that would be similar. The other piece of 9 that, some of the locations of discharge, the 10 discharge for Rock Creek, the discharge for 11 N-CORPE, where that will be, are in these areas 12 where base flows are just beginning to pick up 13 and expressing themselves from these large 14 groundwater formations. So that was the point 15 of comparison. 16 Q. And you mention in that paragraph the 17 distance from the discharge point of -- from 18 the discharge, sorry, to the point of perennial 19 flow. What is that distance that you're saying 20 that is about the same? 21 A. And just to be clear there, the 22 discharge, that's the project discharge I'm 23 referring to, so where these projects would 24 empty their pipe into the stream channel. 25 Q. Thank you. And so what would that</p>	<p style="text-align: right;">Page 20</p> <p>1 perennial flow? 2 A. Well, I had done that over a number of 3 times. Recently, the first time I looked at 4 it -- and I say "recently" because I know I 5 traveled this Basin back in the original 6 litigation and looked at all of these streams 7 with the same type of information on where 8 perennial flow started -- but discounting that 9 decade earlier, I would have looked at this 10 late in 2012. 11 Q. About how many observations do you think 12 we're talking about? Half a dozen, a dozen? 13 Something more than that, something less than 14 that? 15 A. And just to be clear, I can't tell you 16 where the exact point of flow starts on -- on 17 Medicine Creek. Some of the properties are 18 private properties that I've never been to. So 19 when I say it's on the order of two or three 20 miles, it's based on my knowledge of where I 21 don't see or did not see flow in the creek and 22 moving downstream and I can see flow, and there 23 might be a mile or so in between there where 24 that flow is starting that I wasn't able to 25 actually observe that in any of those</p>
<p style="text-align: right;">Page 19</p> <p>1 distance be that's analogous? 2 A. So you've got a distance where there's 3 not an established perennial flow at Rock Creek 4 for, oh, a mile or so, and here at the N-CORPE 5 facility, it's, you know, a few miles, on the 6 order of that, and I think I talked about that 7 later in my report. So they're very similar in 8 that respect. The N-CORPE Project is maybe a 9 scaled-up version in terms of it can produce 10 and pump and discharge significantly more water 11 than the Rock Creek Project. 12 Q. Okay. Let's move to Section III of the 13 report, the same page, down at the bottom, that 14 last paragraph. It's subparagraph a. Do you 15 see it? 16 A. Yes. 17 Q. And in that paragraph, it refers to 18 Medicine Creek becoming a perennial stream. 19 When did you -- now, I take it that is a 20 statement that you're intending to be based on 21 your observations; is that right? 22 A. My observations and from review of some 23 of the historical literature. 24 Q. When it comes to observations, when did 25 you make observations of what you consider</p>	<p style="text-align: right;">Page 21</p> <p>1 instances. 2 Q. So in this area, you're describing there 3 are some areas of private property where 4 someone would need permission to get close to 5 the stream? 6 A. That's correct. 7 Q. And did you make observations in both 8 the winter and summer? 9 A. Yes, I have. 10 Q. Did you notice any changes between the 11 winter and the summer? 12 A. One of the places that I've been able to 13 look at on a pretty consistent basis, and it's 14 probably five miles down the stream from the 15 project discharge, that's always had water 16 flowing in it every time I've looked at it. 17 And I didn't make any specific measurements 18 myself, so I can tell from kind of a subjective 19 point of view looking at it about how much flow 20 might have been there in the summer or winter. 21 Most of my visits have been probably in the 22 fall seasons, spring seasons, not specifically 23 in the summertime. 24 Q. And so these visits and observations of 25 flow, just to make sure I'm following along,</p>

<p style="text-align: right;">Page 22</p> <p>1 you're saying that you were eyeballing the flow 2 but not taking streamflow measurements; is that 3 what you're saying? 4 A. That's correct. I didn't take any 5 physical measurements, but looked to see if 6 there was water flowing. And part of that is, 7 is that's just a -- one of the reasons maybe 8 I'm a hydrologist or a civil engineer is I like 9 to look at those kinds of things. So when I'm 10 out and about on various projects and that 11 Basin or others, I'm usually looking at that 12 type of information, observing those kinds of 13 things. So in this case, over the years, I've 14 been able to do that on a number of occasions. 15 Q. Did you take any notes? 16 A. No. I'm more of a mental note guy, 17 so -- much to the chagrin of some of my 18 colleagues I think because they always have to 19 come to me and get it out of the rock trap mind 20 that I have. 21 Q. Now, do you -- based on your 22 observations or experience or other information 23 that you've taken into account, do you expect 24 that the location of the perennial flow is 25 going to vary with the conditions in this area?</p>	<p style="text-align: right;">Page 24</p> <p>1 reference to groundwater located very near the 2 surface. Do you see that? 3 A. Yes. 4 Q. And was that based on observations or 5 data from groundwater wells in that area? 6 A. Well, the wetland vegetation, I didn't 7 look at any groundwater wells to determine 8 that. I was able to see that type of 9 vegetation throughout that upper portion of the 10 Basin. In fact, just very -- within hundreds 11 of feet of the project discharge location, 12 wetlands exist in that area. 13 Some of the groundwater that I was able 14 to determine must be very near the surface. 15 While I didn't look at any wells, I didn't need 16 to. One point in particular, and I think I 17 mentioned this in my report, Mr. Grunewald, and 18 I'm trying to find it here, is that on Item d 19 of that same Section III. 20 Q. I see it. 21 A. So there's a concrete vault, and I'll 22 describe that for you. It's just about, oh, 23 maybe a hundred feet or less upstream of the 24 pipe discharge, so if you can imagine this pipe 25 exiting into the channel. So just upstream of</p>
<p style="text-align: right;">Page 23</p> <p>1 A. So you're asking me in the future or has 2 it over time? 3 Q. In the future, do you expect it to vary? 4 A. Well, in the future, I expect -- the 5 very near future, I expect the flow to start at 6 the project discharge. 7 Q. And that's because you expect that the 8 project will be operational soon, I assume? 9 A. That's correct. 10 Q. When do you expect it to be operational? 11 A. Sometime in the near future. I don't 12 have an exact date on when that will be done, 13 but my understanding is the construction is 14 nearly complete and a few more items need to be 15 taken care of. And I can refer you to 16 Dr. Fanning on when that might occur 17 specifically. 18 Q. Sure. And when you say very soon, then 19 you mean within six months, within two months, 20 tomorrow? What do you mean by very soon? 21 A. I would expect within a month. If I 22 were to put a -- if we were to put a range of 23 days, months, or years, I would say a month, 24 but I'm not -- I'm not certain. 25 Q. Now, also in that paragraph, there's a</p>	<p style="text-align: right;">Page 25</p> <p>1 that, there's a large concrete vault structure 2 that the pipe runs through and that vault will 3 house the flow meter at the end of the 4 pipeline. That flow meter wasn't in place yet, 5 but the vault itself had infiltrated in with 6 groundwater and had equilibrated itself right 7 at the top of the pipe where it was actually 8 starting to flow into that open hole, open 9 flange, if you can picture that on top of the 10 pipe. 11 And the day that I saw that, the 12 construction crew for the pipeline was actually 13 showing up to pump that out because they had 14 yet to seal up that particular vault to keep 15 the groundwater intrusion from coming in. So I 16 got there just in the nick of time to give me a 17 good observation point about the conditions of 18 the groundwater in that particular area and 19 that it was very near the surface. 20 Q. So how -- how long was that condition? 21 You said you just got there in the nick of 22 time. So how long did it last? 23 A. Well, I'm guessing it lasted about 24 15 more minutes because, as I said earlier, 25 they were there to pump it out so they could</p>

<p style="text-align: right;">Page 26</p> <p>1 seal that vault up. That's not a condition 2 that we would typically want to have. In those 3 type of situations, we want to have those 4 vaults dry. So that was pumped out so they 5 could quickly use some material, probably some 6 hydraulic cement, I'm not exactly sure what 7 they would have used, to seal that up and try 8 and keep some of that groundwater infiltration 9 out of that particular impertinence. 10 Q. Do you have any idea what the flow rate 11 was that you were observing? 12 A. No, I don't. That -- that kind of 13 seepage, as you know, groundwater isn't an easy 14 thing to measure and I don't know how long it 15 took to fill up, but it was clear that it had 16 reached a point of equilibrium to have that 17 much liquid in that particular vault, so... 18 Q. And are you aware of any groundwater 19 wells in this area? 20 A. Yes. I've been able to see that there 21 are wells close by. 22 Q. Now, bear with me. 23 A. In fact, I think you can probably see 24 that on Figure 2. There's some -- some of 25 these round circles are center pivot locations.</p>	<p style="text-align: right;">Page 28</p> <p>1 historical references that I included in my 2 report would support that there's groundwater 3 contribution to the stream very close by in 4 this area that would start to form the base 5 flow conditions of the Medicine Creek. 6 Q. In the -- in the absence of operating 7 the N-CORPE Project, would you expect the 8 groundwater levels to remain the same or to 9 change? 10 A. In the absence of the project operating, 11 did I understand your question? 12 Q. Yes. 13 A. So in the absence of that project 14 operating, I would have to assume, given your 15 hypothetical question, that the lands that are 16 nearby and, for example, the N-CORPE well 17 field, would continue to operate as they have 18 in the past and that the conditions of Medicine 19 Creek would probably be similar then as they 20 are now. 21 Q. And once the project is operating, do 22 you expect the conditions to remain the same? 23 A. And the conditions that you're asking 24 about, Chris, are the conditions of the stream 25 then?</p>
<p style="text-align: right;">Page 27</p> <p>1 And while I don't know for certain where their 2 wells are located, I am fairly certain they're 3 very close to where these -- these pivots are. 4 So there would be groundwater wells. 5 Q. Aside from the wells associated with 6 those pivots, are you aware of any other wells 7 in the area? 8 A. Kind of outside the confines of this 9 figure, I'm sure there's, excuse me, a 10 substantial number of wells. We know that the 11 well field itself, and that shows up on 12 Figure -- back to Figure 1 again, it's just a 13 few miles to the north. So those -- those 14 wells would be there. 15 Q. Thank you. Is the water table in the 16 vicinity of the discharge location, do you -- 17 do you consider that water table condition to 18 be a natural condition? 19 A. So help me a little bit with what you're 20 referring to as just the water table. 21 Q. Well, would you consider the high 22 groundwater levels that you were reporting on 23 to be representing the water table? 24 A. The conditions that I've observed and 25 were able to confirm through some of the</p>	<p style="text-align: right;">Page 29</p> <p>1 Q. The groundwater levels that you were 2 referring to earlier. 3 A. I would assume here in the vicinity of 4 the outlet, you know, there would be a similar 5 type of operation; that they probably would 6 reflect what has historically occurred there in 7 that location. I don't have a specific magic 8 ball to tell you what -- magic crystal ball to 9 suggest what the levels would specifically be 10 in the future. 11 Q. Okay. Thanks. Now, there were -- also 12 on page three, there's a reference to 13 streamflow measurements. Are you aware of any 14 other measurements of the flow along Medicine 15 Creek in 2013 besides the ones you reported on? 16 A. Well, there are a couple of gages that 17 you can see on Figure 1. There's the gage 18 upstream of Harry Strunk Lake that's labeled 19 6841000 and then downstream at Harry Strunk 20 Lake, 6842500. 21 On Medicine Creek itself, I'm not aware 22 of any type of gage or a continuous monitoring 23 system that currently is in place. There is a 24 tributary on Medicine Creek called Fox Creek. 25 That's located close by to Curtis. That has a</p>



<p style="text-align: right;">Page 30</p> <p>1 gage on it. I think right now it's out of 2 operation for some -- my understanding is some 3 construction, bridge construction, but that has 4 collected data over the years. 5 I think historically there was also a 6 gage back in the day at Maywood, but I don't 7 know the times for that. But your question, in 8 2013, I don't know of any other gaging 9 locations or point measurements that might have 10 been made by others. 11 Q. Okay. Thanks. If you could flip to 12 page four, I would appreciate it. 13 A. Okay. 14 Q. Now, there's a reference in this section 15 to Model results. I'll point you to 16 paragraph three, for example. There's a 17 sentence that says the Model results from the 18 Kansas experts. Do you see that? 19 A. Yes. 20 Q. I just want to confirm which Model 21 results that you're talking about. Could you 22 just confirm which Model results you were 23 looking at or referring to? 24 A. So -- yes, I can. I was talking about 25 the report that Dr. Perkins and Mr. Larson had</p>	<p style="text-align: right;">Page 32</p> <p>1 observe that groundwater was near the surface, 2 that if this water would discharge into the 3 channel, number one, I can't reconcile the idea 4 that the channel that I observed and the 5 stretch of land that it traverses across, that 6 the amount of water that Mr. Larson and 7 Dr. Perkins suggested would be lost seemed to 8 be possible. 9 Q. And have -- I should ask a couple of 10 general questions. Have you ever run the RRCA 11 Groundwater Model? 12 A. Like got in it and took a drive with it? 13 No. 14 Q. You know, take it for a walk. 15 A. No. I'm not -- I don't -- have not 16 input specifications to the Model, and to use 17 the Modeler lingo, "turned the crank," to see 18 what kind of information comes out of it; 19 however, I've used Modeling information like 20 the RRCA Groundwater Modeling Output and many 21 others to incorporate into information or 22 projects that I might be working on. And in 23 this case, I was able to look at the 24 presentation that I think primarily Dr. Perkins 25 put together on what the fate of this water</p>
<p style="text-align: right;">Page 31</p> <p>1 presented in this case, and that information 2 suggested that groundwater levels must be -- 3 must be lower than what I might have observed. 4 And I made that based on a figure which I don't 5 have in front of me that they provided that 6 indicated increases in groundwater depth in 7 places of over nine feet near the project 8 discharge location. 9 Q. And so then in that next paragraph, 10 paragraph four, you're still talking about the 11 same Model results there; is that right? 12 A. That's correct; where, in my 13 understanding, Dr. Perkins and Mr. Larson used 14 the RRCA groundwater model and put into it the 15 discharge water from the N-CORPE Project as it 16 might occur and then made an analysis and some 17 conclusions about the fate of that discharge 18 water. 19 Q. And so you mentioned in that fourth 20 paragraph you can't reconcile the physical 21 reality, I'm going to paraphrase, with the 22 Model results. And feel free to correct me if 23 I've got that wrong. I'm assuming that's 24 right. What is it that you couldn't reconcile? 25 A. Well, as I was out at the site and could</p>	<p style="text-align: right;">Page 33</p> <p>1 might be, and that's what my opinions here are 2 based on. 3 Q. Thank you. On the last paragraph on 4 this page, there's a reference to transit 5 losses being, I'm going to paraphrase, nothing 6 more than de minimis. Do you see that? 7 A. I see the last paragraph, yes. 8 Q. Do you see the reference to "de 9 minimis"? 10 A. Yes. 11 Q. Is that an engineering term? 12 A. I don't think engineers get to have 13 credit for the Latin "de minimis" term; 14 however, we use it often and, in my mind, it 15 would be -- you know, "little" or "none" is 16 what the term would mean. And that's my intent 17 here; that it's a small number relative to -- 18 Q. By "little" or "none," are you referring 19 to an amount, a percentage? Can you give me 20 sort of a handle on what you mean by that? 21 A. I think in this case, perhaps not 22 determinable; that we won't be able to 23 determine how much loss, if there is any, what 24 it might be. 25 Q. How would you -- if you had to determine</p>

<p style="text-align: right;">Page 34</p> <p>1 transit losses that occurred to augmentation 2 water discharge from the pipeline until it gets 3 down to the accounting gage or any gage that 4 exists on Medicine Creek, how would you go 5 about determining the transit loss? 6 A. Well, I can tell you how I wouldn't do 7 it, and I wouldn't put it in a groundwater 8 model and try and measure it in a groundwater 9 model. And I put quotations around "measure," 10 because I just don't think you can do that, and 11 that's part of my -- part of my problem with 12 what was done in the way Kansas has done this, 13 but I would measure it. 14 Q. Mr. Riley, I apologize for jumping in, 15 but our time is growing short and that isn't 16 the question I asked you. I appreciate you 17 might want to answer that question, but I would 18 appreciate it if you would answer the question. 19 If you were to try and assess those 20 transit losses, how would you go about it? 21 A. I would -- well, I haven't thought about 22 it in a lot of detail. I would certainly 23 measure -- take measurements at various points, 24 not unlike the data that's included in the back 25 of my report that the Department of Natural</p>	<p style="text-align: right;">Page 36</p> <p>1 of the Medicine Creek, but as you move 2 downstream towards the reservoir itself, I 3 would probably think that it would be on that 4 same order of de minimis. The channel gets a 5 lot wider through that system, so I think I 6 would agree with that term being used for the 7 whole stretch of Medicine Creek. 8 Q. And have you done any separate analysis 9 from what you presented in this report 10 regarding that conclusion about it extending 11 the entire reach? 12 A. Well, some of that conclusion would be 13 my just experience over time in this and other 14 locations, but certainly being able to take a 15 look at the synoptic data that was collected, 16 it demonstrates I think pretty well that the 17 creek is a gaining stream as you move down, so 18 I would expect that to remain the same. 19 And that's -- that's another -- 20 going back to one of your earlier points, 21 Mr. Grunewald, on what's analogous to Rock 22 Creek, I think that's another piece that's 23 analogous in that they're gaining reaches where 24 you have groundwater infiltration through the 25 reach. And you can see through the records or</p>
<p style="text-align: right;">Page 35</p> <p>1 Resources collected at a few points that you 2 can see on that figure, Chris, at those 3 locations where they collected data and made 4 some actual physical measurements of 5 streamflow, and do that at a number of 6 locations over time. 7 Q. And by "over time," what would you 8 consider the right period of time? 9 A. Well, I think it's important to have 10 some data prior to, and Medicine Creek has got 11 a pretty good historical record on that. So, 12 again, I haven't thought out specific details. 13 I like lots of data, so I don't think it 14 would -- it wouldn't be an unreasonable thing 15 to collect data for maybe time periods that 16 might be closer, and then as you understand the 17 system better, on a less frequent basis. 18 Q. Thank you. And in that conclusion where 19 you say "de minimis," did you intend for that 20 to apply to the entire reach of Medicine Creek 21 from the discharge point of the pipeline all 22 the way down to Harry Strunk Reservoir, for 23 example? 24 A. Most of my focus and what I put together 25 here, I was really thinking about the upper end</p>	<p style="text-align: right;">Page 37</p> <p>1 data that what's collected, even for this 2 report, that discharge increases as you move 3 downstream. 4 Q. Thank you. And if you can accept -- for 5 the purposes of these questions that will 6 follow, if you can accept that transit losses 7 to the augmentation water discharge do occur, 8 do you agree or disagree that that would have a 9 negative impact on the allocations to the State 10 under the Compact accounting? 11 A. I don't think I'm in a good position to 12 give a yes or no on that particular answer. On 13 some of the accounting components, while I've 14 been around it and I don't deal with it on a 15 daily basis, I would have to defer to 16 Dr. Schneider and what he said earlier in the 17 previous deposition and what I heard him say 18 and others say in our group about what those 19 distributions of allocations might be given 20 those different scenarios. 21 Q. Thank you. Regarding getting back to 22 the RRCA Groundwater Model, do you have an 23 opinion as to whether the Model is able to 24 reasonably compute transit losses to base flow? 25 A. Well, I didn't have an opinion in my</p>

<p style="text-align: right;">Page 38</p> <p>1 report about that, but I think for what it was 2 designed to do, and my understanding of the 3 Model was to not evaluate transit losses, but 4 determine what base flow components throughout 5 the Basin are, it seems like a reasonable tool. 6 And I think I point that out in one of 7 my last paragraphs on Section IV on page four. 8 It's the next to the last paragraph; that it's 9 a useful and practical tool and it has an 10 important function to the RRCA to provide the 11 kind of information that it does. However, as 12 I go on in that particular paragraph and we can 13 actually measure streamflow, as engineers and 14 scientists in keeping with I think the concepts 15 that folks have laid out for this particular 16 Compact, that we'll measure data where we can 17 and use a Model in lieu of that. But the Model 18 itself has a very important component for the 19 RRCA processing. I believe that to be true. 20 Q. Thank you. I just have a couple more 21 questions. Now, do you know what the project 22 discharge rate is going to be? 23 A. Not specifically. I think it has a -- 24 probably a maximum discharge rate that would be 25 in, you know, 80 to 90 cfs. I don't know if it</p>	<p style="text-align: right;">Page 40</p> <p>1 types of things and the losses associated with 2 those. 3 Q. What about losses to the groundwater in 4 the area to evapotranspiration? 5 A. So your question is, would augmentation 6 discharge water have an effect on the 7 evapotranspiration potential of groundwater 8 that's in the area? 9 Q. Would the addition of the water increase 10 evapotranspiration loss that is occurring in 11 the area? 12 A. I don't think I have an opinion on that, 13 but I'm having a hard time parsing out your 14 question as to the status quo and that there's 15 no change. Are you asking me about from 16 evapotranspiration in the existing conditions? 17 So, for example, if we walked out there today, 18 there's some potential -- evaporation potential 19 that exists, and is there a delta between what 20 happens today and what might happen when the 21 N-CORPE Project discharge is operating? 22 Q. That's right. 23 A. Yeah. I don't think -- I don't think I 24 have an opinion on that. I'm not certain. 25 Q. I have one last question, which is page</p>
<p style="text-align: right;">Page 39</p> <p>1 could do more than that or less than that. I 2 haven't looked at the actual engineering design 3 calculations which dictate a little bit of that 4 at least maximum rate. But my understanding 5 is -- 6 Q. Thank you. 7 A. My understanding is -- 8 Q. Oh, go ahead, please. 9 A. I'm sorry. My understanding is that 10 that would be kind of a maximum range and some 11 of that you can calculate from, if 60,000 12 acre-feet was the amount in the year and it ran 13 all year, it can accommodate that particular 14 discharge. 15 Q. If water is added to the stream from the 16 pipeline discharge, could that increase 17 evapotranspiration loss in the areas where it's 18 wet? 19 A. So evapotranspiration loss of the 20 augmentation water or of just the area in 21 itself? 22 Q. Any loss to any of the water, 23 augmentation water or water in the stream. 24 A. Well, I don't think it would have an 25 effect on existing water sources and those</p>	<p style="text-align: right;">Page 41</p> <p>1 four. In the last sentence, you say "the 2 Model" -- "to use the Model to measure 3 streamflow falls short of the mark and rests on 4 invalid assumptions." Can you list the invalid 5 assumptions you're referring to there? 6 A. Well, I think I'll go back to what you 7 didn't want for my answer earlier in that -- 8 Q. Perfect. 9 A. And a Model that shouldn't be used in 10 this case to measure or have the implied 11 ability to measure streamflow. So that 12 assumption is, in fact, invalid in my opinion. 13 Q. And is there anything else you would add 14 to that, or that's the invalid assumption, 15 that's the total of it? 16 A. I think to suggest that the Model would 17 be used to measure streamflow, and I believe 18 that's how the Kansas experts have represented 19 it, that we're using the Model to measure this 20 flow, that that does not meet the standard of 21 what one should do when you can go out and 22 actually measure the flow with a stream gage or 23 with gaging equipment, the flow that's in the 24 stream. 25 Q. Okay. Thank you. I have no further</p>

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1 questions.  
2 MR. BLANKENAU: Scott, I assume  
3 that you did not join us? Hearing nothing, I  
4 think that concludes the deposition.  
5 MR. GRUNEWALD: Okay. Thank  
6 you, Mr. Riley.  
7 THE WITNESS: Thanks. Thanks,  
8 Chris.  
9 (At 12:17 p.m., the deposition  
10 was concluded.)  
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1 DEPOSITION OF THOMAS E. RILEY, P.E.  
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4 Signature of witness  
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7 STATE OF )  
8 : ss.  
9 COUNTY OF )  
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11 Subscribed and sworn to before me this  
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1 C-E-R-T-I-F-I-C-A-T-E  
2 STATE OF NEBRASKA )  
3 : ss.  
4 COUNTY OF LANCASTER )  
5 I, Jill R. Pilkington, RMR, General  
6 Notary Public in and for the State of Nebraska,  
7 do hereby certify that THOMAS E. RILEY, P.E.,  
8 was by me duly sworn to testify the truth, the  
9 whole truth and nothing but the truth, and that  
10 the deposition by him as above set forth was  
11 reduced to writing by me.  
12 That the within and foregoing deposition  
13 was taken by me at the time and place herein  
14 specified and in accordance with the within  
15 stipulations; the reading and signing of the  
16 witness to his deposition having not been  
17 waived.  
18 That I am not counsel, attorney, or  
19 relative of either party or otherwise  
20 interested in the event of this suit.  
21 IN TESTIMONY WHEREOF, I have placed my  
22 hand and notarial seal the day of  
23 February, 2014.  
24 Jill R. Pilkington, RMR  
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1 DEPOSITION OF THOMAS E. RILEY, P.E.  
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