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Full exhibit list for today will be included in the final
transcript.

1 Lansing, Michigan

2 Monday, June 23, 2008 - 8:32 a.m.

3 JUDGE PATTERSON: Are we ready?

4 MR. REICHEL: Ready to proceed, Judge. Respondent
5 calls as its next witness Kristen Mariuzza.

6 REPORTER: Do you solemnly swear or affirm the
7 testimony you're about to give will be the whole truth?

8 MS. MARIUZZA: Yes.

9 MR. REICHEL: Good morning, Ms. Mariuzza.

10 KRISTEN MARIUZZA

11 having been called by the Respondent and sworn:

12 DIRECT EXAMINATION

13 BY MR. REICHEL:

14 Q First, could you please state your full name and spell your
15 last name for the record?

16 A Kristen Mariuzza, M-a-r-i-u-z-z-a.

17 Q Thank you. And where do you live?

18 A In Ishpeming, Michigan.

19 Q Now, it's my understanding that, until last July, you worked
20 for the Department of Environmental Quality Water Bureau; is
21 that correct?

22 A Yes, I did.

23 Q And where were you based?

24 A In the Upper Peninsula district office.

25 Q And just to frame the testimony that you're going to give

1 today, is it correct that, during the course of your
2 employment at DEQ, you were involved reviewing both the Part
3 31, the groundwater permit application, and the Part 632,
4 mine permit application; is that correct?

5 A Yes, I was.

6 Q You need to speak louder.

7 A Yes, I was.

8 Q Thank you. And again just to lay some background here, with
9 regard to the Part 31 permit application, did you have a
10 particular focus reviewing the wastewater treatment system
11 design?

12 A Yes. I reviewed the basis of design.

13 Q And with regard to the Part 632 or mining permit
14 application, what issues or set of issues were you asked to
15 focus on?

16 A I looked at the wastewater treatment plant design of that
17 permit also and surface water quality monitoring locations
18 and also some of the storm water issues.

19 Q Okay. Let me first ask you to briefly describe your
20 educational background, where you went to college and what
21 degree you received.

22 A I went to Michigan Technological University in Houghton, and
23 I received a bachelor of science in environmental
24 engineering.

25 Q And what year did you get your bachelor's degree?

1 A 1998.

2 MR. REICHEL: Your Honor, I would note for the
3 record that Ms. Mariuzza's resume, which is marked as
4 Respondent's Exhibit 13, is already admitted pursuant to
5 stipulation of parties.

6 JUDGE PATTERSON: Okay.

7 Q During your -- when you were a student at Michigan Tech,
8 could you describe briefly the types of courses -- not each
9 one but just the types of courses that you took in order to
10 obtain your environmental engineering degree?

11 A There was a variety of environmental engineering courses;
12 air quality, water treatment, wastewater treatment design,
13 groundwater engineering courses.

14 Q And while you were in college both during the academic year
15 and in the summer some of the years, were you employed at
16 all?

17 A Yes, I was. And for two years I was employed by the iron
18 mines by Cleveland Cliffs, and one summer I worked as an
19 environmental intern and another summer I worked as a
20 production truck driver.

21 Q I think the court has already heard some testimony. But
22 when you refer to Cleveland Cliffs, you're talking about,
23 are you not, an open pit iron mine operating in the Upper
24 Peninsula; is that correct?

25 A Yes.

1 Q After you -- excuse me. As an environmental intern at
2 Cleveland Cliffs, what sort of responsibilities did you
3 have?

4 A I worked on the Title 5 air permit. They were, at that
5 time, identifying sources of emissions. I also put together
6 monthly reports for NPDES discharges and did some storm
7 water inspections following rain events.

8 Q Since you received your degree in environmental engineering,
9 have you subsequently obtained any professional licenses or
10 certifications?

11 A Yes. I'm a licensed professional engineer.

12 Q And after you completed your degree, how were you first
13 employed professionally in the environmental field?

14 A I worked for a small consulting firm in northern Wisconsin.
15 And a lot of the work that we did was groundwater
16 investigations and leaking underground storage tanks. Some
17 of it was site investigation, sampling, a little bit of
18 maybe modeling the fate and transport of any leaking
19 underground storage tanks.

20 Q And how were you next employed in the environmental
21 engineering firm?

22 A I began working for the department in the surface water
23 quality division in November of '98.

24 Q And when you started with the DEQ, what was your initial
25 position and could you briefly describe your

1 responsibilities?

2 A Sure. My primary responsibility was a Part 41 engineer, and
3 that's for municipal wastewater. And I was -- my duties
4 required me to review municipal wastewater treatment plant
5 design, upgrades, collection systems, any new projects in
6 the Upper Peninsula.

7 Q Okay. Just -- I think just so the record is clear, Part 41
8 is a particular part of the Natural Resources Environmental
9 Protection Act that involves the regulation of municipal
10 wastewater treatment plants; is that correct?

11 A Correct.

12 Q In addition to your involvement in the -- strike that. In
13 working in the Part 41 program, were you called upon to
14 review designs and engineering plans for wastewater
15 treatment plants?

16 A Several, yes.

17 Q In addition to that design review function, what, if any,
18 responsibility did you have with regard to compliance
19 monitoring for water discharges?

20 A For six or seven counties on the western side of the U.P., I
21 handled compliance. I would inspect the facilities. And
22 these were both municipal wastewater plants and industrial
23 wastewater facilities.

24 Q And were these typically involving discharges to surface
25 water?

1 A Yes; yes. The facilities that I inspected were surface
2 water discharge facilities.

3 Q So they would have had so-called NPDES permits then; is that
4 correct?

5 A Correct.

6 Q During the course of your employment with the DEQ, did you
7 assume additional responsibilities over time?

8 A Yes. Occasionally we had special projects. And in 2004, I
9 was asked to work on proposed mining applications.

10 Q And I take it you're referring to a proposal to develop
11 what's been referred to in this case as the Kennecott Eagle
12 Mine?

13 A Yes.

14 Q You indicated that this was in 2004. During that time
15 period, were you, together with other Department of
16 Environmental Quality staff, involved in setting up and
17 conducting a meeting with some local citizens or
18 organizations called the Eagle Alliance?

19 A Yes.

20 Q Could you briefly described what that involved or what the
21 purpose of that was?

22 A Sure. We put together a meeting. This was for surface
23 water discharges. And it was a meeting to inform any
24 interested party how a surface water permit was actually put
25 together and how the permit limits were developed. And so

1 they went through a step-by-step process, the surface water
2 assessment section, and explained the development of a
3 discharge permit.

4 Q Just so the record is clear, at that stage, was this more of
5 a generic description of the process or was it focused on
6 some particular proposed discharges?

7 A It was just a generic description of how permits were put
8 together.

9 Q Again, during the 2004 time period, did you have occasion to
10 visit the site of the proposed Eagle Mine?

11 A Yes, I did.

12 Q And did you go with anyone else, and what was the purpose of
13 your visit?

14 A When I was put on the project, I went with Joe Maki up to
15 see the site, and that was so that I could get acclimated
16 with the site. It was a new project, just, you know,
17 general introduction to the project I would be working on.

18 Q And again in this time period of approximately 2004, were
19 you provided copies of some preliminary or background
20 information that was being collected by either Kennecott or
21 consultants working for Kennecott?

22 A Yes.

23 Q And did that, for example, include hydrogeologic --
24 preliminary hydrogeologic information?

25 A Correct. It was a preliminary hydrogeological report.

1 Q Okay. During this time period, again in 2004, did you --
2 since you were based in the Upper Peninsula district office,
3 to what extent, if any, did you act as a liaison with other
4 staff of the Water Bureau based here in Lansing?

5 A That was a lot of what I did was work with Office of
6 Geological Survey. And I was more of a liaison between the
7 Lansing staff for Water Bureau frequently. Can you -- did I
8 ask your question?

9 Q Yes, you did. So, for example, would that entail
10 information or developments with the Lansing staff?

11 A Yes; yes. If I received any information and I thought that
12 there would be an appropriate person to take a look at it
13 for some general information in Lansing, I would pass that
14 on.

15 Q Okay. Moving forward in time to 2005, did you learn by that
16 point that what is now Part 632 of the NREPA statute that is
17 involved in this case had been enacted and that the DEQ was
18 authorized to develop Administrative Rules under that
19 statute?

20 A Yes.

21 Q And were you asked to participate in any part of the process
22 that led to the development of Administrative Rules?

23 A Yes. After the first couple of meetings -- I'm not sure how
24 many -- I was asked to join in on the work group for writing
25 the Rules.

1 Q Okay. There's already testimony in the record about this
2 work group you referred to. But could you briefly describe
3 your understanding? Was this a multiple-stakeholder work
4 group of different interests?

5 A Exactly. It was different people representing different
6 interests. And we all were at the same table trying to put
7 together Rules.

8 Q Okay. And your role in this process was what in terms of
9 the Water Bureau staff?

10 A Well, I would say it was to answer questions that related to
11 Water Bureau-regulated issues, any storm water-type things
12 that came up. It was more just being knowledgeable about
13 the Water Bureau program and our -- the Water Bureau
14 programs. It was helpful to have somebody at the table,
15 because with this project being -- or not this project, but
16 with the Rules, there would be water involved.

17 Q Would it be fair to say that your role in the process was
18 essentially providing technical assistance and support
19 rather than being an actual drafter of the proposed Rules?

20 A Yes; yes.

21 Q Continuing on in the 2005 time period, if you recall, did
22 you have any occasion to meet with either Kennecott or
23 consultants retained by Kennecott to discuss some of the
24 preliminary background data that they were developing in
25 relation to the site?

1 A Sure.

2 Q And among other things, did that include any discussion of
3 hydrogeological information?

4 A If I recall correctly, that is why we met was to discuss
5 that information.

6 Q Okay.

7 MR. REICHEL: Could you please bring up
8 Respondent's Exhibit 137?

9 Q And when you say "we met," were there other DEQ staff other
10 than yourself present in the discussions with Kennecott on
11 hydrogeologic issues, if you recall?

12 A Yes. Joe Maki and I believe Chuck Thomas.

13 Q And I believe there's also some testimony in the record.
14 Who is Mr. Thomas and what was his role in this discussion?

15 A He was -- reviewed the hydrogeological information. Joe
16 Maki asked him to provide his expertise in that area.

17 Q And again we're talking, so the record is clear, about a
18 period of time in 2005 where -- before permit applications
19 had actually been submitted; correct?

20 A Correct.

21 Q Okay. It takes a minute for the machine to warm up here.
22 We have up on the screen what we've marked for
23 identification as Respondent's proposed Exhibit 137. Do you
24 recognize what this document is?

25 A Yes, I do.

1 Q What is it?

2 A This was an e-mail that I sent acting as the liaison between
3 Water Bureau -- Eric Chatterson was in the Lansing office.
4 And we had some hydro- -- excuse me. We had had a
5 meeting -- we had had a meeting and decided that more
6 information was necessary. And I just thought that Eric may
7 be interested in knowing what we were going to require
8 further and what information he would have coming his way.

9 Q Okay. Well, without reading the contents of this note but
10 just looking at it, if you're familiar with it, is it fair
11 to say that this meeting that you referred to involved a
12 discussion of -- among department staff and consultants for
13 Kennecott about some additional information that DEQ staff
14 thought would be important to have or useful to have in
15 reviewing a potential mining permit application when it was
16 submitted?

17 A Yes; yes. That's why it was written.

18 Q Okay. And Mr. Chatterson -- could you explain for the
19 record, what part of the DEQ he works for and why he was
20 being -- why this information was being shared with him?

21 A Yes. He works for the groundwater permits unit, and he does
22 the hydrogeological review for groundwater permits. And in
23 the case they were going to apply for groundwater discharge,
24 I just thought it was good information to pass on to him
25 again acting as a liaison.

1 Q So this is essentially a heads-up or just passing on
2 information to Mr. Chatterson?

3 A Correct; correct.

4 Q Around that same time period in 2005, if you know, had the
5 Department of Environmental Quality Water Bureau engaged a
6 contractor to -- or was it involved in conducting some other
7 baseline environmental information about surface water or
8 stream conditions in the area?

9 A Yes. There was not a whole lot of baseline data from that
10 area. So the surface water assessment section here in
11 Lansing hired a contractor to actually go out and collect
12 some baseline data.

13 MR. REICHEL: Please bring up Respondent's
14 proposed 135.

15 Q Does the name White Water mean anything to you?

16 A Yes.

17 Q What was that?

18 A That was the contractor that did the work.

19 Q We have up on the screen what we've marked for
20 identification as Respondent's proposed Exhibit 135. What
21 is this the title page of, if you know?

22 A This is the report that White Water put together following
23 the field work.

24 Q I'm not going to ask you to read through the whole document.
25 But again was this -- did you review this document or were

1 you given a copy of this document?

2 A I was given a copy, yes.

3 Q Okay. And did you -- what did you understand the nature of

4 the information generally to be?

5 A The nature of the information was just to provide the

6 baseline data for -- the first report was for the main

7 branch of the Salmon Trout River.

8 Q Okay. Is that -- if you recall -- we can scroll into this.

9 A Okay.

10 Q But if you recall, was this initial report one that focused

11 on the main branch of the Salmon Trout River -- if you

12 recall?

13 A I'd have to see the date.

14 Q Okay.

15 MR. REICHEL: If you could move ahead to the

16 introduction section which -- I'm sorry -- I believe is it

17 page 4 or 5, I believe. Keep going, please.

18 A I see the date is March 23rd, 2005. So this would be the

19 second report.

20 MR. REICHEL: Well, keep going, please. If you

21 could bring up to the introduction. I'm sorry. I meant to

22 make a note of the specific page here. Please bear with us

23 while we get to the right section. Okay. If you can scroll

24 back up to the first paragraph of the introduction, please.

25 Okay. Could you enlarge that? I'm sorry.

1 Your Honor, can we pause for just a moment? We're
2 having a little technical glitch. We don't need a break.
3 We just need to switch a mouse on this computer.

4 JUDGE PATTERSON: Sure.

5 Q Directing your attention, Ms. Mariuzza, to the second
6 paragraph, the sentence that begins, "It presents chemical
7 physical data," take a moment to read that. And does that
8 indicate or refresh your memory as to when the data reported
9 in this report was collected?

10 (Witness reviews document)

11 A Well --

12 Q Can you read that part of the screen?

13 A Yeah. Let me -- okay. It presents chemical, physical and
14 biological study elements that were investigated May through
15 November 2004.

16 Q Okay. In any event, you were provided with -- you were not
17 directly involved in this study; correct? In field activity
18 in 2004?

19 A Not -- I did not do the sampling.

20 A I did not do the sampling.

21 Q Okay. In any event, if you know, after the initial phase of
22 the baseline work that White Water did for the DEQ, did DEQ
23 or did the Water Bureau decide to collect some additional
24 data in a particular geographic area?

25 A Yes; yes. The phase one report was on the main branch of

1 the Salmon Trout River. Once there was enough information
2 that supported that groundwater would be flowing in the
3 northeast direction, the surface water assessment section
4 decided to collect some additional data from the east branch
5 of the Salmon Trout River to get some baseline water quality
6 data.

7 Q In connection with that follow-up or further investigation,
8 did you have any role in looking at the area and some
9 preliminary consideration about possible sampling locations?

10 A I did. I went out with the contractor and we actually
11 walked to the different locations, looked at different seep
12 locations.

13 Q And if you recall the time period when this -- 2005 when
14 would you have done that?

15 A In the fall, early fall.

16 Q Do you recall whether or not -- after you did that, at some
17 later point, did you share with other DEQ staff -- strike
18 that. When you went out to the site in the early fall of
19 2005, did you take any photographs?

20 A I did. I took photographs of the sites we visited.

21 Q And did you subsequent share those photos with other DEQ
22 staff?

23 A Yes, I did.

24 MR. REICHEL: Would you please bring up
25 Respondent's 161?

1 Q Do you recognize this document?

2 A Yes, I do.

3 Q And could you briefly summarize what it is and what you're

4 talking about here?

5 A This was a document sent to surface water assessment

6 section, and I had attached photographs to it. And it was

7 just to describe to them where the seeps were, give them an

8 idea of what they looked like. And then I also indicated

9 which picture was approximately what location as compared to

10 that Figure 9.1 that I have there.

11 Q Okay. Let me just back up just to make the record a little

12 clearer.

13 A Sure.

14 Q Just for the record, what we have on the screen is 161. It

15 appears to be an e-mail from April of '06 from you to Gerald

16 Saalfeld and Sarah Wolf. What part of the DEQ do Mr.

17 Saalfeld and Ms. Wolf work in?

18 A They work for surface water assessment section.

19 Q Here in Lansing?

20 A Yes.

21 Q Okay. And again there's been substantial testimony that

22 permit applications, both the groundwater and mining permit

23 applications, were submitted in February of '06. So if I

24 understand correctly, this e-mail that you sent was actually

25 sent after the permit applications were received; correct?

1 A Yes. They were looking at -- because of the seep locations
2 and the groundwater discharge potentially venting at the
3 seep locations, so they wanted -- they were looking at the
4 water quality in that area. And to give them a general
5 idea, I guess it's always nice to see a picture to help them
6 with their evaluation.

7 Q Okay. So again the function of this was to share with them
8 some photographs that you had taken in the vicinity back
9 in -- I believe it says September of '05; correct?

10 A Yes; yes.

11 Q And your e-mail refers to a -- some points to a Figure 9.1.
12 Is that a -- if you recall, was that a figure that was in
13 the groundwater permit application?

14 A It was in the groundwater permit application, yes.

15 Q Okay.

16 MR. REICHEL: Could we please have up on the
17 screen Respondent's proposed Exhibit 141 at page 96?

18 Q I don't know if you can read it from here, Ms. Mariuzza. In
19 the lower right-hand corner, does that indicate what figure?

20 A Yes, it does.

21 Q If you recall, is this the Figure 9.1 that you were
22 referring to in that e-mail?

23 A Yes, it was.

24 Q And so your email -- I think we'll go back there in a
25 minute -- was talking -- if I understand correctly, was

1 talking about where you took some photographs in relation to
2 an area on this -- depicted on this map; is that correct?

3 A Correct.

4 Q Do you have a laser pointer there with you?

5 A I do, yes.

6 Q Could you please indicate on that map by way of reference
7 the approximate area or areas where you took the photographs
8 referenced in the email?

9 A Okay. Up in this area right here (indicating).

10 Q So for the record, you're indicating an area to the
11 northeast of the proposed surface facilities; is that
12 correct?

13 A Correct.

14 Q Between that area and some of the tributaries to the east
15 branch of the Salmon Trout River?

16 A Yes. This is where the headquarters of the seep -- this is
17 where the seeps are located, right here where you see the
18 relief in the map.

19 MR. REICHEL: Can you enlarge that section,
20 please?

21 Q Does that depict a little more closely the --

22 A Yes, it does. And what I did is, in the e-mail, I talk
23 about seep 1B or 1G and give numbers. Those were the
24 photographs that I took. And that must have been how I
25 labeled them. And I was just giving a general idea where 1B

1 and 1G are in the area of this sampling point right here
2 that was on this map.

3 Q Okay. And the sampling point you're circling there for the
4 record, can you read what that was?

5 A STRE006.

6 Q Okay. So that was -- at that time, it was a sampling point
7 that had been established in some previous investigation;
8 correct?

9 A This was in the groundwater permit application so, yes.

10 MR. REICHEL: Could we go back how -- if you could
11 just minimize and go back, please, to 161? If you could
12 scroll down through 161 just to briefly take a look at these
13 photographs. One at a time, please. Unfortunately in this
14 version, they are in black and white. So I'm not sure how
15 much detail they show clearly. Okay. Go back down, please,
16 to the first photograph.

17 Q Do you have a hard copy of this e-mail in front of you?

18 A I do, yes.

19 Q Can you refer to that and just briefly describe -- or tell
20 us from memory, if you can, what is being depicted in this
21 first slide?

22 A I'm going to assume -- I don't know -- that they're in order
23 according to my numbers on the e-mail here. But they --
24 what it is is just -- it's a picture showing the small
25 amount of water in the seep area giving them an idea that

1 there really was no stream that this groundwater was venting
2 into. It was the headwaters of these tributaries.

3 Q And just to elaborate on that point, it's true for this
4 photograph. Is it true for each of the photographs?

5 A Yes.

6 Q So what you're saying is that, at these particular
7 locations, at least the first photographs, what were you
8 observing? Was it just a small amount of water seeping from
9 the surface?

10 A It starts with just the hill is wet and slowly there's some
11 rills that come together and form a small -- a small stream,
12 what you'd call a small little creek or a stream.

13 Q Okay. And you understand that eventually -- or where does
14 this water that you observed go, as you understand it?

15 A Sure. All of the water -- on that map, there was -- you
16 don't have it up anymore. Where the sampling locations
17 were, they're all tributaries to the east branch. And I
18 believe the last picture in this e-mail is a picture of the
19 east branch showing the quantity of water that comes from
20 all of these seeps and forms the east branch of the Salmon
21 Trout River.

22 MR. REICHEL: Just scroll down to the next photo,
23 please. Okay. If you'd stop there.

24 Q Is that -- again I apologize for the color. Is that -- or
25 lack of color, I should say. Does that indicate one of the

1 seep locations again?

2 A It does. But the seeps there would be maybe 30 small little
3 springs. So this is kind of after they've had a little bit
4 of a confluence very shortly downstream --

5 Q Okay.

6 A -- all within the same area.

7 Q Okay.

8 MR. REICHEL: Could you move down to the next,
9 please?

10 Q And again briefly how would you describe what's depicted
11 here in the third slide?

12 A And that again -- you can see at the bottom of the picture,
13 that's just the water -- the light reflecting off the water,
14 so again a very small amount of water. These are all
15 different areas that are all contributing to the east branch
16 of the Salmon Trout River.

17 Q Okay. As described in the text of your e-mail?

18 A Yes.

19 Q Okay.

20 MR. REICHEL: Would you go to the next one,
21 please?

22 Q And what's shown in this picture?

23 A This one -- I think it was more measuring a depth to see if
24 it would be an appropriate sampling location to take some of
25 the baseline data.

1 MR. REICHEL: Next, please.

2 A And that's a picture of the east branch of the Salmon Trout.
3 All of the seeps will contribute fully to this section of
4 the Salmon Trout River.

5 Q Okay. So the water depicted in the previous series of
6 photographs you understand to be tributary to what's shown
7 here?

8 A Yes.

9 Q Thank you. And again the purpose of the exercise that you
10 were involved in at this time in September of 2005 was to
11 assist in consideration of possible additional stream
12 sampling locations or I should say surface water sampling
13 locations?

14 A Yes; yes.

15 Q Okay. Moving forward in time now to the end of 2005, let's
16 say, were you assigned or requested to participate in
17 something called a mining review team?

18 A I was.

19 Q And could you briefly describe what the nature of that team
20 was and what your role was in it?

21 A It was a group of people of different areas of expertise put
22 together on a team in anticipation of a proposed mining
23 application.

24 Q And what area or areas -- I think you touched on this
25 before -- were you asked to participate in or focus on?

1 A The wastewater treatment plant and surface water quality
2 monitoring locations and also storm water.

3 Q Okay. And who was the coordinator of this team for the DEQ?

4 A Joe Maki.

5 Q In February of 2006, the DEQ received permit applications
6 for mining permit under Part 632 and a groundwater discharge
7 under Part 31; is that correct?

8 A Yes.

9 Q Let's talk now about the 632 permit application process. Do
10 you recall whether or not Mr. Maki distributed to you and,
11 if you know, other team members copies of provisions of Part
12 632 and of Part 632 Rules for background purposes?

13 A Yes. We were given a copy so that we could look at the
14 areas that we were going to be reviewing the application.

15 Q And was it your understanding that you were being asked
16 ultimately to look at the materials submitted and compare
17 them to the requirements of Part 632 and the Rules?

18 A Yes.

19 Q Did Mr. Maki also make available to you at least portions of
20 the permit application related to the particular subject
21 matters that you described? In other words, did he --

22 A Sorry.

23 Q Let me restate that. After the permit application came in,
24 if you recall, did Mr. Maki provide you with at least some
25 portion of the permit application which again --

1 A Yes, he did; yes.

2 Q And portions of the permit application that related
3 specifically to the subject matters that you described
4 earlier; is that correct?

5 A Yes.

6 Q And what were you -- what was your understanding of what you
7 were being asked to do initially at this first stage? To
8 review --

9 A Review the application for any deficiencies that I saw or
10 information that wasn't included.

11 Q Okay. So among other things, you were being asked to
12 determine whether there were any areas in the part you were
13 looking at that you believe additional information or
14 clarification was needed. Is that --

15 A Yes.

16 Q And based upon that initial review that you performed in
17 2006, did you put together some written comments or initial
18 written comments for Mr. Maki?

19 A I did.

20 MR. REICHEL: Would you please bring up
21 Respondent's Exhibit 63?

22 Q What is this document, Ms. Mariuzza?

23 A Those were my review comments that I provided to Joe
24 following my review of the application.

25 Q Okay. There are a series -- this document contains, I

1 believe, a total of three pages. Does that sound right or
2 do you want to scroll through?

3 A That sounds right.

4 Q Okay. And again the purpose of this document was to provide
5 your initial comments to Mr. Maki?

6 A Yes, it was.

7 Q And -- now, you testified a moment ago that you were asked
8 specifically to focus on certain portions of the
9 application. In addition to that, did you look at other
10 parts of the application?

11 A Yes, I did. I reviewed the application, the one binder of
12 the application.

13 Q Okay. That is the first -- the text and the first --

14 A The text, yes.

15 Q As distinct from the multitude of appendices?

16 A Appendices. Correct.

17 Q Okay. About -- with respect to the other issues, the
18 surface water monitoring, the wastewater treatment, storm
19 water issues, there you did look in detail at the relevant
20 appendices; is that correct?

21 A Yes.

22 Q Okay. So in the first part of this memo, which is dated --
23 what? -- May 12th, 2006; is that correct?

24 A Yes, it is.

25 Q The first section is headed "General review comments." And

1 so in this section, does this -- well, perhaps it's too
2 obvious a question. But in this part are you just
3 commenting generally on the first part of the permit
4 application that you reviewed?

5 A Correct. Some areas were not areas that I was asked to
6 review. They were just comments that I wanted to pass on to
7 the experts, and some of them were relevant to my review.

8 Q Okay. Without going through, at this stage, each of them in
9 detail, if you know, was the comments that you were
10 providing to Mr. Maki -- were the comments that you provided
11 to Mr. Maki or at least some portion of them ultimately
12 compiled in a communication from Mr. Maki on behalf of DEQ
13 to Kennecott sort of combining a set of review comments that
14 you and other individuals provided?

15 A Yes, they were.

16 Q Okay. Well, while we have this up here, let's try to run
17 through at least quickly some of the major -- the ones that
18 are listed here. Under "general review comments" --

19 MR. REICHEL: Could you enlarge that, please?

20 Thank you.

21 Q You first note that, "An NPDES industrial storm water permit
22 may be required for the load-out facility where they'll be
23 transferring ore to railcars." Were you -- well, first of
24 all, were you making a suggestion that this -- let's back
25 up. Based upon your review of the permit application, what

1 did you understand or what was your general understanding of
2 how the ore that was going to be mined from this proposed
3 mine would be transported or where it would be transported?

4 A It was taken by truck and left the site and transferred to
5 railcars at some location. This comment was more of a
6 comment saying, in the future when they transfer the ore and
7 they have a facility just noting that at that time they
8 might need a separate storm water permit, separate from what
9 we were doing here. So it was general comment, just a
10 heads-up, you might need that eventually.

11 Q And I guess more specifically, were you suggesting or did
12 you mean to suggest that whatever facility is used at some
13 other location to transfer ore from trucks to railcars was
14 going to be regulated under this proposed mining permit?

15 A No. This application was for the site only.

16 Q So this was in the nature of a general observation, then?

17 A Just a general observation, yes.

18 Q Okay. Your second comment, again I -- it refers to the
19 possibility or the expectation that, as a part of the
20 surface facilities, there would be a lab that might be used
21 for some analytical work; is that correct?

22 A Correct.

23 Q And you were expressing a comment about -- or just
24 commenting on how the chemicals, if any, used in that lab
25 would need to be managed and segregated?

1 A That was my comment.

2 Q Okay. Based upon your involvement in this project, do you
3 know whether or not the subject of your question or comment
4 here was, in fact, addressed in some other part of the
5 permit application?

6 A It was addressed in the application, yes.

7 Q Okay. The next three comments in 3, 4 and 5, if you recall,
8 were these particular comments among those that Mr. Maki
9 compiled in his combined June 2006 letter to Kennecott?

10 A Yes, they were.

11 Q Turning to the next three; that is, paragraphs 6, 7 and 8;
12 the first two deal with language in the permit application
13 talking about disposing certain materials underground after
14 closure. Do you see that?

15 A Yes, I do.

16 Q Now, jumping ahead in time, have you ultimately seen the
17 permit -- the Part 632 mine permit that was issued in this
18 case?

19 A Yes, I have. Yes, I have.

20 Q And do you know whether or not those two issues were
21 ultimately addressed in the permit; that is, how waste
22 materials would be managed or disposed of?

23 A Yes, I have seen that.

24 Q And if you know, does the permit as issued -- does it
25 require that any solid material be characterized --

1 A That's -- yes.

2 Q -- as solid or hazardous waste and disposed accordingly?

3 A Yes, it does.

4 Q And the third concern about detail of the reclamation, again

5 do you know if that's addressed ultimately in the permit?

6 I'm sorry.

7 A That is one I didn't -- this is waste disposal. And so

8 after I made the comment, I really didn't follow up. I have

9 seen the section in the permit that the waste needs to be

10 characterized and disposed of appropriately.

11 Q Okay.

12 MR. EGGAN: Mr. Reichel, just so the record is

13 clear, which concern are we dealing with here? We moved up

14 and down on the screen quite a bit.

15 MR. REICHEL: I'm sorry.

16 MR. EGGAN: I just wondered what issue are we

17 talking about?

18 MR. REICHEL: Okay. The last three -- I

19 apologize, Counsel. Let me try to make that clear. The

20 last three questions were intended to address paragraphs 6,

21 7 and 8, this exhibit, Exhibit 63; 6 referring to discussion

22 of the possibility of disclosing TDRSA liners underground,

23 paragraph 7 referring to apparently some discussion of the

24 possibility of disposing the TWIS underground and 8

25 referring to removal of grizzlies and ore chutes following

1 reclamation.

2 MR. EGGAN: Understood. Thank you.

3 Q Moving forward, Mr. Mariuzza, paragraph number 9 in your
4 general comments, this refers to a discussion of
5 preventative maintenance activities for several areas. Do
6 you see that?

7 A Yes.

8 Q And did you make a comment that preventative maintenance
9 should be discussed with respect to certain -- for berms,
10 storm water management and stockpiles?

11 A Yes, I did.

12 Q You were asking for additional detail? Is that --

13 A For frequencies and when they were going to -- when they
14 were going to perform this preventative maintenance.

15 Q And again based upon your review of the permit as ultimately
16 issued, do you know whether those issues were addressed in
17 the permit?

18 A Yes, that is in there.

19 Q Moving now to the next page, paragraph number 10 refers to
20 "A plan to prevent/identify/address any leaks from concrete
21 floors, concrete sumps for the bituminous surface." If you
22 recall, was this issue addressed or included within the
23 consolidated comments given by DEQ to Kennecott in June of
24 2006?

25 A Yes, it was.

1 Q Okay. 11 is essentially a comment on a typo?

2 A Yes, it was.

3 Q The next section -- I'll try to move through this more
4 expeditiously. The next section with the heading "Temporary
5 development rock storage area," you have a parenthetical
6 after that. It says, "These were my comments that I
7 provided to Margie." Who were you referring to? Margie
8 Ring?

9 A Correct. Margie Ring because she was reviewing that part of
10 the application.

11 Q So again this wasn't really a particular focus of yours?

12 A It was not, no.

13 Q Looking to the next heading in your memo, "Soil
14 erosion/storm water permits/et cetera," under paragraph 1,
15 you note that, "Temporary vegetative stabilization for soil
16 that would be stockpiled for less than one year should be
17 provided." Do you know whether this comment that you
18 offered was included among the consolidated comments offered
19 by Mr. Maki to Kennecott?

20 A I believe so. I know it's in the permit.

21 Q Okay. Turning now to the next section, which was really one
22 of the particular focuses of your review, "WWTF," I assume
23 that's wastewater treatment facility design; is that
24 correct?

25 A Yes.

1 Q The first note where you talk about the contact water basins
2 designed with a double liner and you note that it doesn't
3 include a double composite liner with a leak detection such
4 as a TDRSA, and you go on to say, "It does meet the
5 requirements of Part 22." Could you briefly explain what
6 the nature or the purpose of your comment was here?

7 A Yes. The purpose was that it met the requirements of the
8 Part 22 standards and I was very comfortable with the
9 design. I just wanted to make sure they understood it
10 wasn't the same as the development rock facility.

11 Q Okay. And were you -- did you intend to imply or do you
12 believe that -- were you recommending that the design of the
13 contact water basins go beyond the Part 22 requirements?

14 A I was not.

15 Q Okay. The next comment refers -- item under WWTF design
16 paragraph 2 talks about sludge handling. Again, is this
17 something that was included in the consolidated comments, if
18 you recall?

19 A Yes, it was.

20 Q And if you know, was it ultimately addressed in the permit
21 as issued?

22 A Yes, it was.

23 Q Paragraph 3 in your memo under wastewater treatment refers
24 to identifying how grease, oil, metal shavings, et cetera,
25 from the shops will be collected and some other related

1 comments. Again was this comment among those included in
2 the consolidated comments?

3 A Yes, it was.

4 Q And if you know, was the issue addressed in the permit
5 ultimately issued?

6 A Yes, it was.

7 Q Comment number 4 on the next page again under the heading
8 "Wastewater treatment facility" talks about a proposal that
9 sediments -- at least at that time that sediments from the
10 contact water basins; that is, the wastewater storage ponds;
11 could be stored in the TDRSA. Was that what you took from
12 the initial permit application?

13 A That's how I understood it, yes.

14 Q And based upon your review involvement in the project and
15 later, do you know whether or not that activity was
16 authorized; that is, does the permit as issued authorize
17 storage of sediments in the TDRSA?

18 A The sediments would have to be characterized, and so that's
19 changed. I'm sorry if I didn't answer that clearly.

20 Q Okay. All right. So that issue has been resolved from your
21 standpoint?

22 A Yes, it has.

23 Q The next comment, item 5:

24 "The applicant has proposed decommissioning the
25 TWIS at the end of year 12, but the wastewater

1 treatment facility will remain in operation until year
2 17."

3 I'm not going to have you read the whole thing. But you
4 seem to be focusing on an issue of timing essentially based
5 upon your review. Let's back up. Based upon your review of
6 the mining permit application, did you understand that
7 Kennecott was proposing that, even after mining operations
8 ceased, it would leave the wastewater treatment plant in
9 place and the TWIS for some period of time?

10 A Yes.

11 Q And what did you understand the purpose of that was?

12 A For -- well, the way that I understood it was that the
13 wastewater treatment plant would be left in place and the
14 infiltration, the TWIS, would be removed. They'd re-flood
15 the mine and then, if they needed to treat water, it could
16 be discharged there. I believe that's what that comment is.

17 Q Okay. And if you recall, was this -- this comment that you
18 made in paragraph 5, was that included in the combined
19 comments submitted to Kennecott?

20 A Yes.

21 Q And to the best of your recollection, was that issue
22 addressed satisfactorily?

23 A Yes.

24 Q Your next comment, paragraph 6, is, "The applicant must
25 submit a set of engineering plans for the wastewater

1 treatment facility as a permit condition." Was that
2 ultimately addressed in the permit as issued?

3 A Yes, it is.

4 Q The last section of your memo of May of 2006 has the heading
5 "Surface water monitoring plan." Do you see that?

6 A Yes, I do.

7 Q There are two paragraphs there. One says:
8 "When reviewing surface water data for trends,
9 what will trigger additional action by the company?
10 What will that action include? This is not discussed
11 in their monitoring plan."

12 Do you know, again moving forward in time, whether the
13 comment or question being raised was ultimately addressed in
14 the permit?

15 A Yes, it is.

16 Q And your second comment, you say, "Part 632 should recommend
17 the department's Procedure 51 be followed for biological
18 monitoring." There's been some testimony on this, but could
19 you briefly describe your understanding of what Procedure 51
20 is and who developed it?

21 A That would be what surface water assessment section uses for
22 biological monitoring, water quality monitoring. And it's
23 just the procedures that they would follow.

24 Q And if you recall, in -- strike that. If you recall, was
25 this comment; that is, the method -- the issue of what

1 methods would be used to do this biological monitoring in
2 surface water; was that raised in the department's combined
3 comments to Kennecott?

4 A Yes, it was.

5 Q And do you recall how the company responded to that?

6 A The company responded that they intended to use Procedure 51
7 for the biological monitoring.

8 Q Okay. I want to shift gears a bit here.

9 A Okay.

10 Q Now, while you were engaged in this initial review as part
11 of the Part 632 mining permit application, it's my
12 understanding you also were concurrently involved in
13 reviewing the groundwater discharge permit application; is
14 that correct?

15 A Correct.

16 Q And again I take it you were provided with access to the
17 groundwater permit application itself; is that correct?

18 A Yes.

19 Q And you've already testified that the particular focus of
20 your review was going to be issues having to do with the
21 basis or design for the wastewater treatment plant; correct?

22 A Correct.

23 Q And were you -- as part of the initial review of this
24 application, were you asked to identify any areas where
25 additional information you believed was necessary to

1 complete or provide complete information to support a
2 review?

3 A Yes; yes.

4 Q Okay. And did you -- if you recall, what was that area?

5 A I wanted additional information to support the removal
6 efficiencies, the calculations that the system was designed
7 on.

8 Q Okay. I think I know what you mean, but could you explain
9 it a little bit more? When you talk about removal
10 efficiencies, are you referring to part of the application
11 submitted?

12 A Okay. For the wastewater treatment facility itself, how
13 they actually developed their numbers, where the numbers
14 came from. Does that make sense? Where the effluent
15 numbers came from in the treatability through the facility.

16 Q Okay. And again, to the best of your knowledge, did the
17 groundwater permit application include a document or
18 appendix that identified the projections made by Kennecott's
19 consultants about the expected effluent quality after
20 treatment?

21 A Yes, they did.

22 Q And so is that what you were asking for additional
23 explanation of?

24 A Yes.

25 MR. REICHEL: Could you please bring up

1 Respondent's Exhibit 159?

2 Q And for the record, this is a letter dated March 22nd, 2006,
3 from the DEQ addressed to Jon Cherry. There's a section on
4 basis of design, paragraph 1. If you know, did that -- what
5 does it say and what was your role in that, if any?

6 A Do you want me to read it?

7 Q Yes, please.

8 A Okay.

9 "In order to evaluate the individual unit
10 processes proposed, supporting documentation for each
11 must be provided. This documentation should justify
12 the proposed removal efficiencies for the parameters
13 indicated in the influent and may include calculations,
14 generally accepted standards identified in the
15 manufacturer's data or other credible source."

16 Q And going on, it refers the recipient to you for additional
17 questions on that?

18 A Yes.

19 Q Okay. And again we can get into more detail on this. But
20 based upon your review of the permit application, what was
21 your -- this question refers to evaluate the individual unit
22 processes proposed. What are you referring to there?

23 A Well, the wastewater treatment facility has several unit
24 processes. It has the sedimentation, the clarification, it
25 has the reverse osmosis units. And I wanted to see step by

1 step how these numbers were developed.

2 Q If you know, did Kennecott respond to this particular
3 request in this -- contained in Exhibit 159; that is, this
4 March 22nd, '06, letter?

5 A Yes, they did.

6 Q Could you -- I'm sorry.

7 MR. REICHEL: Before we go that, could you please
8 bring up Respondent's proposed Exhibit 173?

9 Q For the record, this is a memo dated June 7th, 2006, from
10 you to Mr. James Janiczek?

11 A Correct.

12 Q Who is Mr. Janiczek and what was his role?

13 A He is the permit section chief for groundwater permits. And
14 so his role -- this was a general memo sent that's sent for
15 all permits that come into the field office.

16 Q Okay. So if I understand you correctly, when the DEQ Water
17 Bureau gets a permit application in Lansing, it asks
18 district staff to answer certain questions?

19 A Correct, just to identify any potential issues that might be
20 out there that the Lansing staff wouldn't be aware of.

21 Q And so that was the function of this memo from you to Mr.
22 Janiczek?

23 A Yes, it was.

24 MR. REICHEL: And if we can scroll down further
25 to -- okay. Stop there.

1 Q Under item 2, could you read the second sentence, please, of
2 your response?

3 A Yes. The question is -- or the answer would be:
4 "For administrative completeness, justification
5 for pollutant removal through each unit process was not
6 included (for my technical review). Other than my
7 needing that information, there was nothing apparent to
8 me that was missing or inaccurate for my administrative
9 completeness review."

10 Q Okay. So after you wrote this memo, did -- to your
11 knowledge, did the department ultimately receive a response
12 from Kennecott that addressed this issue that you raised
13 that's reflected in the last two documents?

14 A Yes.

15 MR. REICHEL: Could you please bring up
16 Intervenor's Exhibit Number 235? Would it be possible to
17 enlarge that a little bit, please?

18 Q The heading on this letter, it's from Kennecott Eagle
19 Minerals Company addressed to the Groundwater Permits Unit;
20 correct?

21 A Yes.

22 Q And the heading is, "Additional responses to MDEQ concerns"?
23 A Yes.

24 Q Does the cover letter indicate that among the items
25 addressed in this document regards to comments B.1 -- do you

1 see that?

2 A Yes.

3 Q Now, B.1 was the request that you generated for

4 justification on removal efficiency?

5 A Correct.

6 MR. REICHEL: Could we scroll to the next page,

7 please? Okay. Hold it right there. Thank you.

8 Q This is page 2 of Intervenor's 235, with the heading "Basis

9 of Design." And then under "Response to comment 1," a

10 certain response is provided. I don't -- I'm not going to

11 ask you to read the entire thing, but did you -- were you

12 provided a copy of this letter and any attachments at or

13 around the time it was sent to the --

14 A Yes, I was.

15 Q And did you review the information provided or transmitted

16 with this document?

17 A I did.

18 Q And from your standpoint did it provide you with the

19 additional type of information that you had requested, or

20 had Ms. Bailey or Mr. Janiczek request in the preceding

21 exhibit?

22 A Yes. This is the information that I wanted.

23 Q I'm not going to have all of it, but among other things, it

24 refers to a -- do you see "a new and revised version of

25 Appendix G-1"?

1 MR. REICHEL: Could we scroll down a little more?

2 Q If you recall -- I know it's been awhile ago, but if you
3 recall, was Appendix G-1 involved in this estimation of
4 expected treatment efficiency, or I should say the quality
5 of the expected effluent? If you need to look at --

6 A Can you repeat that?

7 Q I'm sorry. Let me start over. If you remember in looking
8 at this, was Appendix G-1 of the groundwater permit
9 application -- did that have to do with estimates by
10 Kennecott and its consultants about what concentrations of
11 various substances would be expected to remain following
12 treatment?

13 A Yes, it did. And it also took one parameter and actually
14 went through with one parameter and showed exactly how they
15 did the calculations for all the other parameters too. And
16 that's what I needed. I just needed justification on how
17 the calculations were performed, what they were using. I
18 didn't expect them to give me calculations for every
19 parameter.

20 MR. REICHEL: Could you please bring up
21 Intervenor's Exhibit 138?

22 Q Take a moment to look at this and tell me if you recognize
23 this document?

24 A Yes, I recognize it.

25 Q What is it?

1 A This would be the document that they supplied that has all
2 of the calculations for one parameter, for nickel.

3 Q For nickel? Okay. So just for the record, as a -- it's
4 from --

5 MR. REICHEL: Could you scroll back to the top,
6 please?

7 Q It's from Foth & VanDyke, the date in April 2006, and the
8 subject is "Wastewater Treatment Plant Treatment
9 Calculations for Nickel"; correct?

10 A Yes.

11 Q So if I understand your previous testimony, this is an
12 example that illustrated how -- provided by Kennecott's
13 consultants illustrating how they justified or arrived at
14 their projected wastewater characteristics after treatment?

15 A Correct. The first few calculations I did not look at,
16 because they talk about leakage and some of the composite
17 concentrations for the influent. And I didn't look at those
18 numbers. I started with the --

19 Q With the --

20 A With the influent value.

21 Q That's an important point, just to avoid some confusion of
22 the record. Just so it's clear, your involvement in the
23 Part 31 review -- were you asked to review estimates either
24 quantitatively; that is, how much -- the basis for estimates
25 made by Kennecott about the volume of water that was going

1 to flow into the system?

2 A No.

3 Q Were you asked to undertake or critique the geochemical
4 analyses or assumptions that went into estimates provided by
5 Kennecott of the expected influent to the treatment system;
6 that is, what was going to enter the system?

7 A No. I used the influent numbers that were provided.

8 Q And if you know, were other department staff, or team
9 members, I should say, involved in looking at -- looking at
10 these other issues? That is --

11 A I believe so.

12 Q So your focus really was on the -- if I understand it
13 correctly, was on the design, the basis for design and the
14 expected performance of the treatment system?

15 A Correct.

16 Q So after this additional information was received, did you
17 then later in 2006 perform your substantive review of the
18 basis of design?

19 A Yes, I did.

20 Q And in doing that, were you looking at the information
21 provided in relation to any of the requirements of the Part
22 22 groundwater discharge rules?

23 A Yes. I used Rule 2218, which is in subsection (2), which is
24 the basis-of-design requirement.

25 Q So in other words, that provision of the groundwater

1 discharge permit rules requires the applicant to document
2 the basis of their wastewater treatment design; is that
3 correct?

4 A Correct.

5 MR. REICHEL: Could you please bring up
6 Respondent's Exhibit 194?

7 Q Could you please state for the record what this document is?

8 A This is the memo that I sent to the Groundwater Permits Unit
9 regarding my basis-of-design review of the groundwater
10 discharge permit. And it included the conditions that I
11 wanted added into the permit.

12 Q And the date of this memo is --

13 A December 8, 2006.

14 Q So again I think you touched on this, but a function of this
15 was to compare what was submitted in relation -- by
16 Kennecott in relationship to the requirements of Rule
17 2218 --

18 A Yes.

19 Q -- of the Groundwater Rules; is that correct?

20 Q Yes.

21 Q And in the course of doing that, did you review -- well,
22 first, what the rule required? Is that correct?

23 A Yes, I did.

24 Q And then compare what was submitted by the applicant in
25 relation to that?

1 A That's exactly what I did.

2 Q And ultimately what conclusion if any did you reach,
3 regarding whether the information provided by the applicant
4 with respect to the basis of their design did or did not
5 satisfy the requirements of the Part 22 rules?

6 A They met the requirements of Part 2218.

7 Q And in reaching that conclusion, am I correct in
8 understanding that you looked in detail at the information
9 they provided about the different elements of the treatment
10 system?

11 A Yes, I did. It's laid out right in the rule, the individual
12 things they need to provide, which would be the flow and --
13 I have this in front of me here, but -- the treatment
14 method, the engineering plant schematics. It's pretty well
15 laid out, exactly what needs to be provided.

16 Q And you touched on this earlier, and it's already in the
17 record that in this instance what Kennecott has proposed in
18 its groundwater discharge permit application is a treatment
19 system that has a series of different units or processes
20 within it; is that correct?

21 A Yes, it does.

22 Q And based upon your review of the application and the
23 supplemental information that Kennecott provided, from your
24 standpoint did the company sufficiently and adequately
25 describe the basis for the system that it proposed and their

1 conclusions about its expected performance?

2 A Yes, they did.

3 MR. REICHEL: Could you scroll down, please, to --
4 keep going, please. Okay. Stop there, please.

5 Q There's a heading, I believe on the fourth or fifth page of
6 the document, "Best Technology in Process and Treatment,"
7 BTPT, one of those acronyms?

8 A Yes.

9 Q Could you explain briefly for the record what this part of
10 the memo was addressing and why you were writing about this?

11 A I was writing about this because of Rule 1098,
12 Antidegradation, and because this was going to include
13 mercury as one of the effluents. They would have to meet
14 the requirements of this rule. What I had to do was look at
15 would this be the best technology to treat the mercury? And
16 I think it's a -- I do think it's the best technology to
17 treat it. It filters in the ionic range, and I don't think
18 that you can get a better treatment out there right now
19 that's adequately demonstrated and available.

20 MR. REICHEL: If you could scroll to the next
21 page, please? Stop there, please.

22 Q So again you talk about the requirement that the applicant
23 demonstrate that they're using the best technology --

24 A Correct.

25 Q -- process available for this application?

1 A Yes.

2 Q And the object -- or is the object to minimize the addition
3 of particular pollutants into the environment?

4 A (No verbal response)

5 Q I'm sorry. That wasn't well stated. You led into this
6 discussion that -- on the preceding page by noting and the
7 Department of Environmental Quality had indicated that as a
8 part of its review of this proposed discharge, he was
9 looking at what's called antidegradation?

10 A Correct.

11 Q And could you describe briefly what this antidegradation
12 analysis entails or why it's done?

13 A Well, why it's done is, if there's an additional loading to
14 mercury to the watershed, then they need to meet certain
15 requirements of the rule. And I don't have it sitting in
16 front of me, so --

17 Q No. That's fine.

18 A But one of the things that they need to do, one of the
19 requirements they need to meet is to provide the best
20 treatment possible for mercury. And through my research and
21 what I looked at, I do believe that it's the best treatment
22 for this -- to treat the mercury at this facility.

23 Q And then the concluding section of your memo from December
24 of '06 makes some recommendations. The first three numbered
25 recommendations refer to monitoring conductivity. Do you

1 see that?

2 A Yes.

3 Q Could you explain first of all what conductivity is and what
4 recommendations you're making here?

5 A Well, the reason that I wanted them to monitor the
6 conductivity is because if the metal concentration were to
7 increase in the effluent, the conductivity would also
8 increase. So by using that as an indicator and measuring
9 conductivity, they have a good idea where their wastewater
10 treatment system is at all the time. And then what I wanted
11 was them to calibrate that meter and give us an idea -- or
12 the Department, whoever would be reviewing the monitoring
13 reports, an idea where they should be, what operating range
14 they should be in.

15 Q And can I interrupt you a moment please --

16 A Uh-huh (affirmative).

17 Q -- and just back up for the lay people among us without
18 going into the chemistry. Conductivity, I take it, just as
19 you've described it here -- is this -- it's a measurement of
20 a certain characteristic of in this case water; correct?

21 A Correct.

22 Q Or a solution. Is it something that you can measure
23 essentially in real time by some sort of a meter or other
24 device?

25 A Yes. They'll have, yes, a meter, a conductivity meter.

1 Q As distinct from, for example, chemical analyses for
2 constituents which typically requires taking a sample,
3 sending it to a lab and then doing analytical chemistry work
4 on it; is that --

5 A Correct. There's a difference, yes. This would be a meter.

6 Q And so you talked a moment ago about the use of a
7 conductivity metering approach, if I understand you, as an
8 indicator of -- or trying to draw some correlation between
9 conductivity readings and the chemical characteristics of
10 the water?

11 A Correct; yes.

12 Q And so could you -- under the recommendations that you're
13 making here, how would -- first of all, are you recommending
14 that Kennecott be required to do some tests to establish a
15 relationship between these conductivity measurements and
16 analytical chemical results?

17 A Yes. When they calibrate the meter, they would calibrate it
18 with the effluent quality. So they would have to do
19 effluent quality analysis, make sure everything is where
20 it's supposed to be and then calibrate the meter, so you
21 have an idea what the conductivity is with the effluent
22 parameters at the same time. So you know, if you're
23 operating within that range of conductivity, that your
24 effluent is also staying in that range. So it's just
25 another indicator, a continuous indicator that the system is

1 operating correctly.

2 Q And again this is something that just -- for the reasons you
3 touched earlier, something that essentially could be done in
4 real time? You don't have to wait for a lab result?

5 A Correct.

6 Q And if you know, were the recommendations that you made here
7 with respect to the use of conductivity -- continuous
8 conductivity monitoring and calibrating those conductivity
9 measurements to the chemical -- analyzed chemical
10 constituents in samples -- were those recommendations
11 embodied in the groundwater discharge permit that was
12 ultimately issued here?

13 A Yes, they were.

14 Q And could you briefly describe what your last
15 recommendation, number 4 is, or what your point was there?

16 A Yes. Boron is one constituent that would be difficult to
17 remove with reverse osmosis. By raising the pH the way
18 they've proposed in the second pass, that is a form of
19 removal of boron. However, I thought just because -- if
20 everything's operating okay and the numbers are all looking
21 okay, boron could still be escaping through the system, and
22 I thought it should just be an added parameter to monitor
23 and sample for separately -- than the others.

24 Q And if you know, based upon -- again, you've indicated
25 you've reviewed the permit as it was ultimately issued;

1 correct?

2 A Correct.

3 Q And does the permit contain monitoring requirements for
4 boron?

5 A Yes, it does.

6 Q Just overall, again looking at the groundwater permit that
7 was issued in this case, which for the record is --

8 MR. REICHEL: Could you bring up Respondent's
9 Exhibit 118, please?

10 Q Do you recognize this as a copy of the groundwater discharge
11 permit that was ultimately issued in December of '07? Is
12 that correct?

13 A Yes, I do.

14 Q Now, in connection with preparing for your testimony in this
15 case, you have -- even though you no longer work for the
16 Department of Environmental Quality -- and we'll get to that
17 in a minute -- did you in fact review, prior to testifying,
18 the permit as issued?

19 A Yes, I did.

20 Q And again turning now to the particular issues that you were
21 asked to look at as a part of your review in this process
22 that you testified to earlier, do you believe that the
23 provisions of the permit as issued are consistent with the
24 requirements of Part 31 and the applicable rules; that is,
25 the Groundwater Discharge Rules; in the Part 22 Rules?

1 A Yes, I do.

2 Q Do you understand the question?

3 A Yes.

4 Q You believe it is?

5 A Yes, I do.

6 Q I'm going to shift gears again here, --

7 A Okay.

8 Q -- reflecting the multiple roles that you've played in this

9 process. I want to loop back around now to the mining

10 permit application review process under Part 632.

11 A Okay.

12 Q You described in some detail a little while ago the comments

13 that you provided to Mr. Maki, many of which were included

14 in those consolidated comments to the company; do you recall

15 that?

16 A Yes.

17 Q And I think you touched on this, but I just wanted to be

18 clear. To your knowledge did Kennecott, in October of 2006,

19 provide point-by-point responses to each of the 91 questions

20 -- or comments, I should say, raised in Mr. Maki's letter?

21 A Yes, they did.

22 MR. REICHEL: Could you please bring up

23 Respondent's Exhibit 69? Scroll down. Thank you.

24 Q What we have up here is a transmittal of responses by

25 Kennecott to the DEQ, a June 21st, 2006 letter; correct?

1 A Yes.

2 Q And during the course of your work for the DEQ on this

3 project, did you obtain and review this letter?

4 A I did.

5 Q And the attachments to it?

6 A Yes.

7 MR. REICHEL: And if you could scroll down,

8 please, to I think the second or third page? Keep going,

9 please. I believe this is the fourth page in, "Response to

10 MDEQ Comments Dated June 21st, 2006." Next page, please.

11 Okay. Stop there, please.

12 Q I believe this document has been introduced and other

13 witnesses have already testified about it. But just this

14 the record is clear, this is structured in such a way -- it

15 says "comment 1" and then "response to comment 1," et

16 cetera, et cetera, as it proceeds through; correct?

17 A Yes.

18 Q And if you recall, at the same time that this particular

19 document was submitted by Kennecott to the DEQ, did

20 Kennecott contemporaneously provide some additional

21 information, essentially backup for this document, if you

22 recall?

23 A I'm not sure.

24 Q Fair enough.

25 A Well, the letter and then -- yes, it was a binder with a lot

1 of --

2 Q Right. That's what I was asking.

3 A -- additional information, yes.

4 Q In any event, once this came, did you obtain a copy of that?

5 A Yes, I did.

6 Q And did you review it with respect to issues that were

7 relevant to your functions within the mining review team?

8 A Yes, I did.

9 Q And again, I think we've touched on several of those

10 already. I don't propose to repeat that. Are you aware of

11 whether or not the DEQ, upon receipt -- after it received

12 this information from Kennecott that we just talked about,

13 Exhibit 69 and associated documents, whether it posted that

14 information on its website and solicited public comments?

15 A Yes, they did.

16 Q And as a part of your work on the team, were you provided

17 access to public comments that were received by the DEQ?

18 A Yes, I was.

19 Q And did you in fact review those comments to the extent that

20 they related to any of the issues that you were asked to

21 look at?

22 A Yes.

23 Q And based upon your review of the subsequent information

24 submitted by Kennecott and comments submitted by the public,

25 did you make any recommendations? Well, first of all, after

1 that -- after you'd gone through that process, were you
2 asked by Mr. Maki what recommendations, if any, he would
3 make on the mining permit issues with regard to the
4 particular areas that you were asked to focus on?

5 A Yes; yes, I --

6 Q And what in substance did you indicate to him?

7 A I provided conditions for the permit.

8 Q Okay. Just stepping back a bit --

9 A Oh, I'm sorry.

10 Q I mean did you understand -- we'll get to that in a moment.
11 Did you understand that -- or was it your understanding that
12 you were being asked to indicate whether -- again, with
13 respect to the issues you focused on, whether you believed
14 the permit could be issued or should not be issued,
15 consistent with Part 632? Was that part of your evaluation?

16 A Yes; yes, it was.

17 Q And were you also asked to identify conditions that you
18 believed should be incorporated in the permit if any?

19 A Yes. When I was asked if the permit should be issued, I
20 said I -- that -- with conditions.

21 Q Okay. Could you please bring up Respondent's Number 87?
22 What is this document?

23 A This is the conditions that I wanted included.

24 Q Just for the record it has the heading -- this is again
25 Respondent's 87, "Draft Conditions -- Comments Given to Joe

1 Maki on January 29"; is that correct?

2 A Yes.

3 Q Let's walk through those quickly. The first one talks
4 about, "The permittee shall submit a full set of WTF" -- by
5 that what do you mean? Wastewater treatment facility?

6 A Water treatment facility. I think that might be a -- well,
7 I guess I said, yeah, wastewater treatment facility.

8 Q Anyway, you were recommending that as a condition of the
9 permit the applicant be required to provide engineering
10 designs before they would go ahead and construct the
11 wastewater treatment facility; correct?

12 A Yes.

13 Q And again, I believe you touched on this before, but to your
14 knowledge was such a condition; that is, a requirement that
15 the application submit plans to the DEQ -- engineering
16 designs, I should say, prior to construction; ultimately
17 incorporated into the permit?

18 A Yes, it was.

19 Q This next item talks about a requirement that before
20 starting up the facility, "the permittee shall submit to the
21 Department an approved plan for monitoring the integrity of
22 all impermeable surfaces that will be exposed to contact
23 storm water; is that correct?

24 A Yes.

25 Q And again, do you know whether a condition on the subject

1 consistent with your recommendation -- or your basic
2 recommendation was ultimately included in the permit?

3 A It is in the permit.

4 Q The third item says, "In the event of a discharge from the
5 NCWB" --

6 A IB.

7 Q NCWIB's. I'm sorry. What does that stand for?

8 A Non-contact water infiltration basins.

9 Q Okay. It says "Samples should be collected and analyzed for
10 all parameters indicated in the surface water monitoring
11 plan." It goes on to say, "The results shall be submitted
12 to the Department in the monthly operating report." Let's
13 back up for a minute.

14 A Okay.

15 Q If I understand your testimony correctly, one of the things
16 that you were asked to look at in this project from a water
17 bureau perspective was proposals that were made in the Part
18 632 permit application for the management of storm water; is
19 that correct?

20 A Yes, it was.

21 Q And without going through all of that in detail at least at
22 this point, did you have an understanding that under the
23 approach outlined by Kennecott in its permit application,
24 there was a management regime that was to be set up that was
25 intended to segregate storm water that came in contact with

1 certain polluting materials from other storm water that did
2 not come in contact with those materials?

3 A Yes, I was.

4 Q And with respect to the latter, this non-contact storm
5 water, could you briefly summarize your understanding of
6 how, under the permit application, Kennecott was proposing
7 to manage that storm water?

8 A Yeah. The storm water through the grading plan would be
9 managed separately. So anything that came into contact with
10 the operations that could have any of the constituents of
11 concern in it went to the contact water basins and was
12 graded adequately or through ditching and storm water
13 conveyances. That's what I talk about, the impermeable
14 surfaces. The non-contact water again was, I believe, for
15 separate non-contact water infiltration basins where the
16 storm water would run off into those basins. And they were
17 not lined. The purpose was that the groundwater would
18 infiltrate, because that's non-contact water. It would act
19 as any storm water sedimentation infiltration basin.

20 Q And again, based upon your review of the permit application,
21 what if any was your understanding about the nature of the
22 near-surface soils and the proposed locations of these non-
23 contact water infiltration basins? In other words, are
24 these -- was it engineered to have the water --

25 A Oh, no. The --

1 Q -- seep into the ground, the non-contact?

2 A When looking at them for sizing, it was -- they assumed --

3 excuse me -- they assumed no infiltration. However, this is

4 up on the sand plains, so the infiltration is actually very

5 quick.

6 Q Maybe you could explain a little further. The management

7 strategy for non-contact storm water was to have that run

8 off into non-contact water infiltration basins; correct?

9 A Yes.

10 Q Where what was expected normally to happen to that collected

11 non-contact storm water? What would happen to it?

12 A Normally it would seep into the ground, yes.

13 Q Okay. I'm sorry. But this permit condition talks about in

14 the event of a discharge from the non-contact water

15 infiltration.

16 A Okay. I see what you're asking.

17 Q Could you explain what you mean by that?

18 A Yes. It's not -- because of the rate of infiltration, it

19 would not be expected to ever occur. But if in the event it

20 did, I wanted the condition in there that they sample it and

21 -- they sample it and analyze it for all of the surface-

22 water quality constituents that they had already identified

23 they were going to monitor for in the surface water

24 monitoring plan.

25 Q May I interrupt you there?

1 A Yes.

2 Q Again, just so the record is clear, when you're talking
3 about a discharge in this context, you're talking about a
4 scenario which is -- is contingency, if you will: If so
5 much water enters the non-contact water infiltration basins
6 in such a short time, that it doesn't all seep into the
7 ground, --

8 A Yes.

9 Q -- under this scenario there might be a discharge of non-
10 contact water through a control structure --

11 A Yes.

12 Q -- at the top or the side; is that correct?

13 A Yes.

14 Q And then that discharge would be onto where? Onto the land
15 surface?

16 A Onto the land surface, yes.

17 Q And so that's what this contingency is intended to address;
18 is that right?

19 A Correct.

20 Q And again with respect to this, if you know, was a condition
21 in the permit consistent with your recommendation ultimately
22 included in the permit?

23 A Yes.

24 Q Your next recommendation in this memo from January 29th
25 says, "The following changes should be made regarding

1 surface water monitoring locations for aquatics and water
2 quality"?

3 A Yes.

4 Q And then you go on to identify -- well, in substance are you
5 identifying three proposed additional monitoring locations?

6 A I am, yes. I'll add that site 9, that I say "delete site
7 9," was not deleted. The three sites that were proposed are
8 actually upstream of site 9, so site 9 encompasses all --
9 the water quality at all three of the additional sites.
10 It's a redundant measurement.

11 Q So bottom line, based upon your review of the Part 632
12 permit as issued, did the permit include, or was it
13 consistent with your recommendation to add three additional
14 sites as you've proposed here?

15 A Yes, it was.

16 Q And could you explain again why you were recommending that
17 these three additional surface water and aquatic monitoring
18 locations be added to the initial proposed monitoring
19 system?

20 A Sure. Do you have the map?

21 Q Yes.

22 MR. REICHEL: We will put up on the screen what we
23 intend to mark -- have not yet -- as two demonstrative
24 exhibits which I believe would be -- what? -- 210 and 211, I
25 believe. Again, these are for illustrative purposes. First

1 put up the aquatic one.

2 MR. EGGAN: Mr. Reichel, did you say they're going
3 to be 211 and 210?

4 MR. REICHEL: I believe. Bear with me, Counsel.
5 I need to make sure. I think that's the next number up for
6 us. Yes, 210 and 211.

7 MR. EGGAN: Okay.

8 MR. REICHEL: And, Counsel, I do have for the
9 moment black-and-white copies. We're going to undertake to
10 try to get color copies made; we just haven't had time to do
11 this.

12 MR. EGGAN: Understood.

13 MR. REICHEL: I'll distribute these just for
14 identification and reference purposes. And again, these are
15 being used simply for demonstrative purposes, to help the
16 witness explain her testimony on the subject.

17 Q The first demonstrative that we put up on the screen, Ms.
18 Mariuzza -- look in the lower right-hand corner. Does that
19 have a legend on it?

20 A It says "aquatic sampling locations."

21 Q And on this particular document there's a legend that says
22 "Figure 6-6A," just to back up for clearing the record. If
23 you recall, in the Part 632 permit application supporting
24 materials, was one of the figures a Figure 6-6 which
25 proposed certain aquatic sampling locations; that is,

1 locations where samples would be taken to monitor biological
2 conditions as well as water quality?

3 A Yes.

4 Q And this -- what I put up on the screen is not that
5 document. It essentially is a variant of that with the
6 lower case "a" added to it.

7 MR. REICHEL: Now, if you could zoom in a little
8 bit, please, in the area to the -- is it possible to enlarge
9 that and take the legend off? Basically we want to surround
10 -- yeah, that would be good there.

11 Q Ms. Mariuzza, do you have a laser pointer with you?

12 A Yes, I do.

13 Q Again, to recap, you recommended that three additional
14 sampling locations or stations be established?

15 A Yes.

16 Q And those were described in narrative terms in your draft
17 permit condition in the permit itself; correct?

18 A Yes.

19 Q Can you illustrate for the record whether proposed locations
20 consistent with your recommendations are now depicted on
21 this figure, and if so, where?

22 A Yes. 8, 9 and 10 are the ones that I proposed.

23 Q And again could you describe in a way that we can write down
24 in the transcript --

25 A Sure.

1 Q -- where those are located in relation to the groundwater
2 discharge system?

3 A Sure. The groundwater discharge system would be located
4 approximately right here in the main service facility area,
5 and these are to the northeast where the groundwater is
6 expected to vent. The topography again changes right
7 through here on the northeast, and that's have the
8 groundwater vents. And this is the beginning of the
9 tributaries where I'm pointing. Each -- what's the word? --
10 proposed location for monitoring is along the lines of one
11 of those seep discharges that are identified.

12 Q Which are essentially -- what? -- tributaries to the east
13 branch?

14 A Yes. This is the east branch right here (indicating),
15 running up.

16 Q And again, are these locations in the vicinity where you
17 testified -- in the general vicinity of where you testified
18 earlier this morning where you went out in the field, I
19 believe in September of 2005, and looked at then existing
20 and possible additional sampling locations?

21 A Yes. We looked probably a little bit further up in the
22 topography here, but, yes, they're on the same -- the same
23 tributaries.

24 Q And again, is what's depicted on this demonstrative, this --
25 what's labeled 6-6a, would it be generally consistent with

1 the recommendations that you made about additional
2 monitoring locations?

3 A Yes.

4 MR. REICHEL: Now, could you please bring up the
5 other figure?

6 Q In the lower right-hand corner -- I don't know if you can
7 read it.

8 MR. REICHEL: Maybe you should blow that up a bit.
9 Sorry. The lower corner, so we can see the legend on it.

10 Q What's the legend there?

11 A Figure 6-2a, Regional Surface Water Monitoring Stations.

12 Q And again, by way of background, if you recall, Mr.
13 Mariuzza, in the original permit application materials
14 submitted by Kennecott, was there a Figure 6-2 which
15 identified then proposed surface water monitoring locations?

16 A Yes.

17 Q And have you had a chance to look at this document, this
18 demonstrative which is labeled Figure 6-2a?

19 A Yes, I have.

20 Q And does this figure identify on it the three additional
21 sampling locations that we've been talking about, the ones
22 that you included in your recommendations?

23 A Yes, it does.

24 Q Could you indicate with your laser pointer where those are?

25 A Yes. Right here (indicating), here and here.

1 Q We're going to try to blow this up a little bit.

2 A Okay. Yeah, so it would be STRE005, STRE010 and STRE009.

3 Q And again, are those essentially the same locations as

4 depicted on the previous slide, the other one we looked at a

5 moment ago?

6 A Yes, they are.

7 Q So bottom line, are these proposed surface water sampling

8 locations consistent with your recommendations?

9 A Yes, they are.

10 Q And do they depict what you understand to be the additional

11 locations required in, I believe, Condition L-11 of the

12 permit?

13 A Yes.

14 Q That is, we're talking about the mining permit?

15 A Correct.

16 Q And continuing on with your Exhibit Number 87, you also make

17 a note that "They," presumably Kennecott, "should have

18 downgradient monitoring wells from the non-contact water

19 infiltration basins?

20 A Yes.

21 Q Do you know, based upon your review of the permit as issued,

22 whether such a requirement was included?

23 A Yes. There wasn't.

24 Q And what would be the function of those downgradient

25 monitoring wells?

1 A Again, the infiltration basins. The water is expected to
2 infiltrate through the basins. And so having a downgradient
3 monitoring well, you would -- it's more of a monitoring,
4 just to ensure that there isn't something infiltrating into
5 the ground. These are the non-contact water basins. It's
6 not expected to have any parameters of concern. It's just
7 insurance.

8 Q Okay. After you provided your draft comments to Mr. Maki in
9 this document here, were you -- did Mr. Maki share with you
10 and other team members -- again, about January of 2007 -- a
11 draft Part 632 permit?

12 A Yes; yes, he did.

13 Q And did you have occasion to provide any comments on that?

14 A Yes, I did.

15 MR. REICHEL: Could you please bring up what's
16 been labeled for identification as Petitioner's proposed
17 Exhibit 10bd?

18 MR. LEWIS: Would that be Part 632?

19 MR. REICHEL: No. This is actually -- it's
20 Petitioner's Part 31, Exhibit -- supplemental exhibit list
21 10bb. Could you scroll down so we can just see the top of
22 this document, please? Oh, that is. Okay. I'm sorry.

23 Q What is the heading on this document?

24 A These were my comments after the first draft of the 632
25 permit was put together. And I read it and made these

1 comments.

2 Q And in making these comments, were you confining yourself to

3 the particular areas of the Part 632 permit application

4 process that you had particular responsibility for; that is,

5 wastewater treatment, storm water management, surface water

6 impacts?

7 A No, I was not.

8 Q So you were just looking at the whole document?

9 A Yes, I was.

10 Q And offering comments --

11 A Yes.

12 Q -- based upon your individual review? Correct?

13 A Yes.

14 Q It's a fairly lengthy document. I don't propose at this

15 point to go through this in detail. We can come back to it

16 if necessary. But moving ahead in time, we're talking here

17 at this point, on February 12th of '07 -- this is a draft

18 permit -- an initial draft Part 632 permit; correct?

19 A Yes.

20 Q Ultimately -- let me loop around to your circumstances.

21 Ultimately in, I believe, July of 2007, --

22 A Yes.

23 Q -- you decided that you were going to leave the DEQ; is that

24 correct?

25 A Yes, I did.

1 Q And was that for any professional reason or was it personal
2 or family-related?

3 A Personal. I have a young family at home, and I just wanted
4 to take a couple years to spend with my kids before they
5 started school.

6 Q Now, as of the time that you left the Department in July of
7 '07 -- as of that point had your basic recommendation with
8 respect to the Part 632 permit; that is, supporting issuance
9 of the permit subject to certain conditions -- had that
10 changed?

11 A No. I was still in support of --

12 Q Okay.

13 A Did I answer that? Now I'm feeling like I didn't answer
14 your question. But, no, I supported the permit.

15 Q No; no, you did. You shouldn't judge -- if I looked
16 quizzical it was because I couldn't read my own handwriting.
17 It had nothing to do with your answer. And again, in taking
18 that position -- I think I asked you this before, but I just
19 want to be clear on this: In taking that position with
20 respect to the issues that you looked at on the Part 632
21 permit, did you believe, as of the time you left the
22 Department, that the proposed permits, subject to the
23 conditions you had recommended, would satisfy the
24 requirements of Part 632?

25 A Oh, yes, I did.

1 Q And in making that recommendation or reaching that
2 conclusion -- I think you've testified to this before --
3 were you aware of the basic standards embodied in Part 632
4 that are to guide the Department in deciding whether or not
5 to issue a Part 632 permit or a mining permit?

6 A Yes.

7 Q And to your knowledge does that include a consideration of
8 whether or not the applicant is shown that the proposed
9 mining activity will reasonably minimize potential adverse
10 impact to surface water, groundwater or other resources?

11 A Yes.

12 Q Did you understand that to be the case?

13 A Yes, I did.

14 Q And did you have any understanding as to whether or not, in
15 making a permit decision, the Department was required to
16 consider ultimately whether the proposed mining activity
17 would or would not -- a) would comply with the requirements
18 of 632 and b) would not cause pollution, impairment or
19 destruction of natural resources?

20 A Yes.

21 Q After you left the Department, were you contacted by the DEQ
22 about whether or not you would be willing to come to testify
23 as a witness in this case about your involvement in the
24 permit review processes?

25 A Yes, I was.

1 Q And you obviously agreed to do so?

2 A Yes, I did.

3 Q And you've already testified to this, but since that time
4 you've had occasion to review both the Part 31 and Part 632
5 permits as issued; correct?

6 A Yes, I have.

7 Q And you've already talked about the Part 31 permit. On the
8 Part 632 permit -- again, I didn't necessarily want to spend
9 the time going through all of the individual comments or
10 questions that you raised back in February of 2007; that is,
11 in that previous document, Petitioner's Exhibit --
12 Petitioner's Part 31 Exhibit 10bb. But let me ask you this:
13 Having looked at those again and looked at the permit as
14 issued, do you believe or do you still -- does anything in
15 those comments that you made at the time lead you to
16 conclude to a different conclusion about whether or not the
17 permit as issued satisfies the requirements of Part 632?

18 A No. I think the permit satisfies the requirements.

19 MR. REICHEL: Your Honor, if I can take a short
20 break just to deal with some exhibit issues so I could get
21 to that when I come back? And then I expect to pass the
22 witness.

23 JUDGE PATTERSON: Okay.

24 (Off the record)

25 MR. REICHEL: Your Honor, before I move for

1 admission of exhibits, with your permission and indulgence,
2 Mr. Eggan, there were one or two questions -- or basically
3 one question that I neglected to ask in my first part of
4 direct that I'd like to follow up with.

5 JUDGE PATTERSON: Okay.

6 Q Ms. Mariuzza, you've testified earlier this morning about
7 recommendations that you made with respect to additional
8 sampling locations for both surface water sampling and
9 aquatic sampling; correct?

10 A Yes; yes.

11 Q Now, you testified that you were part of a mining review
12 team effort of various individuals put together by the DEQ;
13 correct?

14 A Correct.

15 Q And do you recall, was one of the other members of the team
16 Ms. Jessica Mistak of the DNR's Fisheries Division?

17 A Yes, she was.

18 Q And did you and she discuss or compare notes about your
19 position or your thoughts on where additional surface water
20 and aquatic sampling should occur?

21 A Yes, Jessica and I talked about it.

22 Q And if you know, are the recommendations that -- are the
23 recommendations that you made that you testified about here
24 that ended up in the permit -- are those consistent or
25 inconsistent with what you understood Ms. Mistak's

1 recommendations on that subject?

2 A I understood we were in agreement with the sampling
3 locations chosen.

4 MR. REICHEL: Your Honor, at this time I'd like to
5 move for the admission of a series of exhibits. The first
6 one is Respondent's Exhibit 137. And each of the ones I'm
7 going to go through were discussed with the witness this
8 morning, which was a July 28 email -- July 28, '05 email
9 from Ms. Mariuzza to Eric Chatterson.

10 MR. EGGAN: No objection.

11 MR. REICHEL: Thank you.

12 MR. LEWIS: No objection.

13 JUDGE PATTERSON: No objection; it will be
14 entered.

15 (Respondent's Exhibit 137 admitted)

16 MR. REICHEL: The next is Respondent's Proposed
17 Exhibit 161, which was an April 26, 2006 email and attached
18 photos from Ms. Mariuzza to Gerald Saalfeld of the Surface
19 Water Quality Assessment Section.

20 MR. EGGAN: No objection.

21 MR. BRACKEN: No objection.

22 JUDGE PATTERSON: No objection; that will be
23 entered.

24 (Respondent's Exhibit 161 admitted)

25 MR. REICHEL: Next, Respondent's Proposed Exhibit

1 63, which is Ms. Mariuzza's May 2006 memo providing her
2 initial comments on the Part 632 permit application.

3 MR. EGGAN: You said that's the May 12, 2006
4 email?

5 MR. REICHEL: It's a memo, actually, I think.

6 MR. EGGAN: No, I believe if it's the May 12,
7 2006, her general comments, at least what I have is
8 contained in an email. I may be wrong.

9 MR. BROWN: It looks like it's an email to me.

10 MR. REICHEL: You're right. I stand corrected.
11 Thank you, Counsel. It is. Respondent's Exhibit 63 for the
12 record is May 12th, 2006 review comments.

13 MR. EGGAN: No objection.

14 MR. BRACKEN: No objection.

15 JUDGE PATTERSON: No objection; it will be
16 entered.

17 (Respondent's Exhibit 63 admitted)

18 MR. REICHEL: Next, Respondent's Proposed Exhibit
19 87, which is -- appears to be an email with the heading
20 "Draft Conditions Comments" given to Joe Maki on January
21 29th, 2007.

22 MR. REICHEL: No objection.

23 MR. BRACKEN: No objection.

24 JUDGE PATTERSON: That will be entered.

25 (Respondent's Exhibit 87 admitted)

1 MR. REICHEL: Next, Respondent's Proposed Exhibit
2 159. It's a copy of a letter from the water bureau to
3 Kennecott, identifying some additional information requested
4 by the DEQ water bureau in connection with the Part 31
5 permit application, which included the requested information
6 initiated in Section(b)(1) by Ms. Mariuzza.

7 MR. EGGAN: No objection.

8 MR. BRACKEN: No objection, your Honor.

9 JUDGE PATTERSON: Okay. No object; that will be
10 entered.

11 (Respondent's Exhibit 159 admitted)

12 MR. REICHEL: Next, Respondent's Exhibit 173,
13 which again was discussed on her direct examination, which
14 was a memorandum from Ms. Mariuzza to Mr. Janiczek dated
15 June 7, 2006, identifying -- or responding to certain
16 standard questions about the Part 31 permit application.

17 MR. EGGAN: No objection.

18 MR. BRACKEN: No objection, your Honor.

19 JUDGE PATTERSON: No objection; that will be
20 entered.

21 (Respondent's Exhibit 173 admitted)

22 MR. REICHEL: Respondent's Proposed Exhibit 194,
23 which is Ms. Mariuzza's December 8, 2006 memo regarding her
24 review of the basis of design for the groundwater permit
25 application.

1 MR. EGGAN: No objection.

2 MR. BRACKEN: No objection, your Honor.

3 JUDGE PATTERSON: No objection; that will be
4 entered.

5 (Respondent's Exhibit 194 admitted)

6 MR. REICHEL: And finally, solely for
7 demonstrative purposes, Respondent's Proposed Exhibit 210,
8 which was one of the two figures we projected on the screen,
9 this one with the legend "Aquatic Sampling Locations" and
10 the designation in the lower right-hand corner, "Figure 6-
11 6a. And I would note for the record we are in the process
12 of obtaining color copies to provide to counsel, to replace
13 the black-and-white ones we gave you on an interim basis.

14 MR. EGGAN: This is 210 and 211?

15 MR. REICHEL: Yeah, 211 is the other one,
16 "Regional Surface Water Monitoring Sampling Locations," this
17 the legend, Figure 6-2a, again solely for demonstrative
18 purposes.

19 MR. EGGAN: Your Honor, I've indicated in the past
20 my concern about use of exhibits that are not -- that are
21 for demonstrative purposes but over which there may be
22 consideration in terms of what the ultimate decision is in
23 this case. So I'm going to continue that objection.

24 MR. BRACKEN: No objection.

25 JUDGE PATTERSON: Okay. Well, as I have

1 previously entered them for demonstrative purposes only, as
2 offered.

3 (Respondent's Exhibits 210 and 211 received)

4 MR. REICHEL: That concludes my offer of exhibits,
5 and with that, I pass the witness. That's all I have.

6 MR. EGGAN: I understand. As I understand it, it
7 would be questions now to Mr. Bracken.

8 MR. BRACKEN: I'm going to defer at this time,
9 your Honor. I have no questions at this time.

10 MR. EGGAN: No direction examination at this
11 point?

12 MR. BRACKEN: No.

13 MR. EGGAN: All right. Ms. Mariuzza, I'm Eric
14 Eggan, and I represent the Petitioners in this matter, and
15 I've got some questions for you regarding your testimony
16 this morning.

17 CROSS-EXAMINATION

18 BY MR. EGGAN:

19 Q As I understand it, you have a bachelor's degree from
20 Michigan Tech?

21 A Yes, I do.

22 Q No master's degree?

23 A No, I do not have a master's degree.

24 Q And no Ph.D.?

25 A No Ph.D.

1 Q Are you a hydrologist?

2 A No, I'm not.

3 Q Or a hydrogeologist?

4 A No, I'm not.

5 Q Okay. I assume that you have never written peer reviewed

6 papers related to hard-rock mines.

7 A I have not.

8 Q Have you ever written a peer reviewed paper on any subject?

9 A Not that I recall.

10 Q Okay. Not on wastewater treatment plants?

11 A Not that I recall.

12 Q Well, it's kind of an involved process, so I expect you

13 would recall if you had written one, wouldn't you?

14 A I suspect I would, yes.

15 Q Okay. Never done a -- any sort of a field study of

16 environmental consequences of treatment systems at hard-rock

17 mines?

18 A No, I have not.

19 Q Have you ever actually designed a treatment system?

20 A I have reviewed several designs of treatment systems which

21 takes you right through the calculation process. And, yes,

22 in college in my wastewater treatment design courses I would

23 have.

24 Q Okay. So in your college classes you did the design of a

25 wastewater treatment plant, but have you, since your

1 graduation from college as a profession engineer, designed a
2 wastewater treatment plant?

3 A My role with the Department was to review not design.

4 Q I understand. But just to get the answer to my question,
5 have you designed one?

6 A Outside of college, no.

7 Q Okay. Thanks. And you certainly never designed a
8 wastewater treatment system at a hard-rock mine?

9 A No, I have not.

10 Q You've never done a field study on the impact of acid rock
11 drainage on a groundwater system?

12 A No, I have not.

13 Q Have you been to an underground hard-rock mine?

14 A Yes, I have.

15 Q Where would that have been?

16 A The White Pine Mine in Ontonagon.

17 Q Any others?

18 A That would be the only one.

19 Q Okay. Did you conduct an inspection of the treatment
20 facility at that location?

21 A Yes, I did. I was responsible for compliance at the White
22 Pine Mine with their NPDES discharge permit.

23 Q And is that currently an operating mine?

24 A No, it is not.

25 Q That's a mine that is closed; am I right?

1 A Yes, it is.

2 Q And what we're dealing with or what the DEQ is dealing with
3 there is remediation of environmental impacts?

4 A Yes.

5 Q Now, I heard you testify about your experience in college
6 working at the -- was it Cleveland Cliffs?

7 A Yes.

8 Q Now, that's an open-pit mine?

9 A Yes, it is.

10 Q Okay. And I believe you indicated that part of your
11 experience was as a truck driver, --

12 A Yes.

13 Q -- which must have been a very interesting experience.

14 A It was.

15 Q Those are the big -- the really big R-50's that have --

16 A The 190-ton haul pack trucks, yes.

17 Q Okay. So you were driving those trucks?

18 A I was.

19 Q Okay. As interesting as that experience was, I'm going to
20 take a leap at it and suggest that probably had nothing to
21 do with wastewater treatment facilities or environmental
22 impacts.

23 A Not that summer, no.

24 Q Now, the other summer where you were an environmental
25 intern, it sounded like the work you did was on Title V air

1 permit issues; right?

2 A Yes.

3 Q And also you did -- did you say you did some NPDES
4 inspections?

5 A I put together the monitoring reports, the monthly
6 monitoring reports.

7 Q Okay. And did that have anything to do with the wastewater
8 treatment facility there?

9 A Well, yes, we inspected the wastewater treatment facility
10 which at the iron mines is sedimentation at the facility,
11 and then we would go out to the tailings basins and they
12 have a physical treatment process at the tailings basins.

13 Q Now, what I'm wondering is, were you an important element in
14 the -- in Cleveland Cliffs' monitoring system at that time
15 for the NPDES permits or were you treated as an intern would
16 be?

17 A Well, they gave me the responsibilities to submit important
18 reports. I would say that I did significant work while I
19 worked for Cleveland Cliffs.

20 Q Have you ever reviewed a system like this one in the past?

21 A No, I have not.

22 Q With contact water basins, wastewater treatment plan, land
23 application system? Never reviewed a system like this?

24 A I reviewed clarification. Reverse osmosis, no, and land
25 application was not part of my review in this project.

1 Q I also heard you say that part of what you did or what you
2 did in your career -- and maybe we should go back. You
3 began with the Department, I think, in November of 1998; is
4 that right?

5 A Yes, I did.

6 Q And your responsibilities of participating in this mine team
7 occurred in 2005, so some seven years after you began?

8 A 2004, yes.

9 Q 2004?

10 A Yes.

11 Q So it would have been maybe six years after you began you
12 undertook the responsibility for this particular project?

13 A Yes, I did,.

14 Q Okay. Now, your other activities with the Michigan
15 Department of Environmental Quality included wastewater
16 treatment plants for municipalities?

17 A Yes, it did.

18 Q And that has to do with sewage and sewage disposal and
19 sewage treatment?

20 A Yes, it does.

21 Q And that's different isn't it than the kind of treatment
22 we're dealing with here with the reverse osmosis system and
23 the systems in place here?

24 A It's removing different constituents from the water, yes.

25 Q And clearly you couldn't use a municipal wastewater

1 treatment plant as configured, say, in Iron Mountain to try
2 and remove the constituents that we're dealing with in this
3 particular facility, could you, boron And copper And nickel?
4 A Some of them would be removed in the sedimentation process,
5 yes.
6 Q But they all -- they certainly -- you wouldn't use that kind
7 of system to handle the wastewater that we're dealing with
8 here?
9 A Not completely, no.
10 Q Okay. Now, as I understand it, you reviewed the basis of
11 design for the wastewater treatment facility, the basis of
12 design for the wastewater treatment plant at this particular
13 location under Rule 2218?
14 A Yes, I did.
15 Q And that requires a discharger to provide information such
16 as volume of the wastewater to be treated per unit of time.
17 That's one of the things.
18 A Uh-huh (affirmative).
19 Q And an analysis of --
20 JUDGE PATTERSON: Say "yes" or "no."
21 THE WITNESS: Yes.
22 Q And an analysis of the influent; am I right?
23 A Yes.
24 Q In other words, the substances that are going to be treated
25 And the concentrations that they're going to be treated in?

1 A Yes.

2 Q Now, the wastewater treatment plan And its current design is
3 based on certain assumptions, isn't it, about inflow And the
4 concentrations?

5 A Sure; yes.

6 Q Okay. We know that the wastewater treatment plant is
7 designed to accommodate an inflow of approximately 350
8 gallons per minute.

9 A Correct.

10 Q And that's the design. That's the design that you reviewed?

11 A Yes.

12 Q And if that inflow rate is exceeded, if it is exceeded, then
13 the design capacity is going to be exceeded?

14 A Yes.

15 Q In other words, if there's more water than the system can
16 handle, then the design capacity is going to be exceeded?

17 A Well, the contact water basins serve as equalization so the
18 water can be fed to the wastewater treatment facility at the
19 rate that the facility is designed for.

20 Q Understand.

21 A Okay.

22 Q But if the inflow exceeds that 350 gallons per minute into
23 the system, then pretty soon the contact water basins are
24 going to get backed up, And there's going to be a problem
25 the system just can't handle the amount of water.

1 A Well, the system is designed for 350 gallons per minute.

2 Q 350 gallons, yes. Okay. So that inflow volume, that's a

3 critical element in this process, isn't it?

4 A Yes.

5 Q Okay. And that was one of the assumptions, that 350 gallons

6 per minute is one of the critical assumptions that is part

7 of the basis of the design of that system?

8 A Yes.

9 Q So if the inflow is -- it turns out to actually be 400

10 gallons per minute, the system is probably going to have to

11 be redesigned, isn't it?

12 A The contact water basins can hold -- that serves as

13 equalization.

14 Q It does. It does. But eventually, just your bathtub, the

15 contact water basins, if the -- if the inflow is greater

16 than the design capacity, the inflow is going to back up, is

17 going to cause the contact water basins to overflow.

18 A Again, the system is designed for the 350 gallons per

19 minute.

20 Q So if it's 400 gallons per minute, you would have to

21 recommend that the system be redesigned, wouldn't you?

22 A I didn't look at 400 gallons per minute And through my

23 review.

24 Q Well, that's kind of my point, but my point would be, if it

25 is 400 gallons per minute, someone like you at the DEQ is

1 going to have to recommend a redesign, aren't they?

2 A I wouldn't say "yes" to that. I wouldn't.

3 Q Well, what if it was 600 gallons per minute?

4 A I can't answer that without actually looking at the design

5 numbers. At some point --

6 Q Well, we know that the system is designed for 350 gallons

7 per minute.

8 A Yes; yes.

9 Q Right?

10 A Yes.

11 Q And we know that that 350 gallons per minute is a design

12 capacity meaning it can serve 350 gallons per minute. Maybe

13 there's a -- maybe there's a little bit of a play in that

14 number, but at some point if we get beyond 350 gallons per

15 minute, the system is not going to be able to handle it.

16 You've already testified to that. And so as a result it's

17 going to have to be redesigned.

18 A I struggle with the word "redesigned."

19 Q Reconfigured.

20 A I struggle with that word also.

21 Q Well, what word would you be comfortable with?

22 A I consider it to be maybe made larger.

23 Q Okay. I'll go with that. The system would have to be made

24 larger. Okay.

25 A I don't know that that's a redesign. I don't know that that

1 would be a redesign.

2 Q Okay. I think that -- I think we can probably agree that

3 somehow the system is going to have to be bigger.

4 A At some point if the flow has exceeded what the design

5 capacity was.

6 Q Okay. And that would be true at 600 gallons per minute too,

7 I take it.

8 A I didn't look at those numbers.

9 Q Okay. And you didn't look at 800 gallons per minute either?

10 A I did not.

11 Q Okay. You didn't do -- you didn't do an inflow analysis on

12 this at all. That was somebody else's job within the

13 Agency?

14 A That was somebody else's job, yes.

15 Q But you do understand that the inflow numbers were actually

16 provided by Kennecott?

17 A Yes.

18 Q And inasmuch as Rule 2218 requires a discharger to provide

19 the volume of wastewater to be treated -- we know that from

20 Rule 2218.

21 A Uh-huh (affirmative).

22 Q It requires the discharger to tell you what the volume of

23 water to be treated will be.

24 A Yes.

25 Q If the inflow exceeds that 350 gallons per minute that

1 they've told you about, they will no longer be in compliance
2 with Rule 2218?

3 A I hesitate to answer that question. I just want to -- I
4 guess in order to obtain a discharge permit, they needed to
5 provide a volume of wastewater, And that's what they did.
6 They provided their volume of wastewater for the basis of
7 design. So can you now repeat your question?

8 Q Sure. If it turns out that the volume of wastewater exceeds
9 350 gallons per minute, is more like 400 or 500 or 600 or
10 700 or 1,000 or higher, then they really have not complied
11 with Rule 2218 because 2218 requires them to identify an
12 inflow rate.

13 A And they did that.

14 Q Well, is there a correlation between -- And I know they did
15 as of right now. They have provided a number for you. But
16 if it turns out that that number is inaccurate, then they
17 would have not complied with Rule 2218.

18 A No, I disagree. I think it complied with Rule 2218. They
19 just may need to request a modification of the permit. The
20 number wasn't what was expected when they applied for the
21 application.

22 Q So from your perspective, the numbers that they provide in
23 the permit application -- is there a correlation, I guess,
24 between accuracy or real-world numbers And the number they
25 provide?

1 A The permit is -- the permit is written based on the numbers
2 provided in the application, so they provide the number
3 of -- their volume of wastewater to be treated. The permit
4 is also written based on that volume of wastewater.

5 Q Well, I'm not sure where that leaves us in terms of Rule
6 2218, but it seems to me that 2218 has a built-in
7 requirement that the information be accurate, doesn't it?

8 A In order to comply with 2218, the information submitted at
9 the time of applying for a permit is accurate, is believed
10 to be accurate.

11 Q By Kennecott or --

12 A Sure.

13 Q -- by you or by others?

14 A By the applicant.

15 Q Okay. And if that information turns out to be incorrect,
16 then they will be out of compliance with 2218?

17 MR. REICHEL: Objection.

18 MR. BRACKEN: Objection; asked And answered. I'm
19 sorry. Objection, your Honor. It's asked And answered. He
20 can't continue asking the same question. She's given her
21 opinion.

22 MR. REICHEL: Right, and I would also note that in
23 some sense apparently this is calling for some sort of a
24 legal conclusion. But the witness has answered the question
25 I think three times.

1 JUDGE PATTERSON: I agree. I'll sustain the
2 objection.

3 MR. EGGAN: Okay.

4 Q We also know, as you indicated earlier, the wastewater
5 treatment plant is really intended to treat based on
6 pollutants that were identified by Kennecott?

7 A Yes.

8 Q Okay. At the contaminant levels identified by Kennecott?

9 A Yes.

10 Q And if those contaminant levels are different, if it turns
11 out that the contaminant levels are much higher than they
12 were predicted by Kennecott, then there is going to have to
13 be a change in the design of the wastewater treatment plant,
14 isn't there?

15 A Again, I didn't look at the levels of contaminants, but the
16 first unit process is regulated by pH, And the pH will not
17 go as high as they want it to go without adding more lime to
18 remove the chemical. How do I explain this? The effluent
19 from the clarification process is expected to remain
20 constant or fairly, you know, consistent. And if the levels
21 of the metals to be treated in that unit process were to
22 increase, it would require that the system add more lime to
23 get the pH up to the level that they need.

24 Q So there would need to be changes in the plan for treatment;
25 am I right?

1 A Oh, I don't think so. I think it's just adding more lime.
2 It would just be the amount of lime that needs to be added
3 to get the pH to reach the minimum solubility of the metal.

4 Q So the solution to any problem that arises with the addition
5 of -- either the addition of additional constituents or an
6 increase in the level of those constituents, your testimony
7 would be that the answer would be always just to add more
8 lime, And that's going to solve the problem?

9 MR. REICHEL: Objection. Argumentative, And
10 that's not consistent with the witness' prior testimony.
11 She didn't say "only" to do that.

12 MR. BRACKEN: I join in the objection.

13 MR. EGGAN: Then I'll address the objection.

14 Q What is your testimony? I'm just trying to get a sense for
15 what your testimony is. Is it to add more lime?

16 A You asked if the -- if the parameters identified in the
17 influent were to be higher than expected, that they would
18 have to redesign or change the type of treatment. And I
19 disagree with that. I think the operation would have to
20 change such as adding more lime in that first unit process.

21 Q So that would be one example of a small change that could be
22 made that might address some of the issue.

23 A Correct.

24 Q But if other constituents were higher in other levels,
25 boron, for example, that would probably require some

1 additional, say, changes in the configuration or changes in
2 the basis of design.

3 A Again, changes in the configuration, no. It's going to be
4 operational. Possibly -- I don't know the amount of change
5 you're talking about, And I didn't analysis the system for
6 anything other than what the influent was. You know, yet
7 you could add for ion exchange, maybe you need something
8 larger depending on the number that comes in. I evaluated
9 the system based on the influent numbers that were given to
10 me And reviewed by Geochimica or who reviewed the influent
11 data.

12 Q Well, then maybe that is the answer to the question. Your
13 review consisted of an analysis of the numbers given to you
14 by Kennecott. And your conclusion was based on an
15 assumption that those numbers are correct?

16 A Yes. The numbers were reviewed by the DEQ. We had somebody
17 review those numbers, so, yes, those are the numbers that I
18 reviewed the treatment system.

19 Q Understood. Now, I'm interested in talking to you about
20 this particular system. I assume that prior to undertaking
21 this project you didn't visit other hard-rock mines
22 throughout the country to see how they treat sulfide mining
23 influents.

24 A The White Pine Mine in Ontonagon County is the --

25 Q Is that a mine that handles acid-rock drainage?

1 A No, it is not.

2 Q That's not a sulfide mine?

3 A It's a sulfide-based ore.

4 Q Okay. But it does not, as you indicated, handle acid-rock
5 drainage?

6 A I'm not -- I -- no, not --

7 Q Well, are you familiar with other mines in the United States
8 that handle this kind of -- this kind of acid-rock drainage?

9 A I have not visited any, no.

10 Q You didn't visit any?

11 A No.

12 Q Did you conduct any sort of study of the literature to
13 understand what the problems were associated with it?

14 A No, I did not.

15 Q Now, I'm going to -- I want to talk to you about the system
16 itself. I believe you called it processing units, a series
17 of process units?

18 A Unit processes? Yes.

19 Q Yes, unit processes. Okay. But we can agree, can't we,
20 that it's really a series of sequential treatments?

21 A Yes, it is.

22 Q And that each of those -- And when we talk about sequential,
23 we mean that it starts out And treats for certain
24 constituents And those are filtered out, And then that
25 influent goes to another part of the system And it treats

1 for those different constituents And those are filtered out
2 And on down the line?

3 A Yes.

4 Q So it's important, isn't it, that each of the sequences
5 operate efficiently in sequence?

6 A Somewhat.

7 Q And there are multiple components here, multiple unit
8 processes?

9 A Yes, there's multiple unit processes.

10 Q And each of those components, each of those unit processes
11 has its own discrete function?

12 A It has a function; however, there is some -- I don't want to
13 use the word "leeway," but reverse osmosis, say, is a type
14 of technology that could treat this wastewater without the
15 preliminary treatment, without the clarification, the metals
16 precipitation; however, to protect the membranes, it's just
17 better to remove that ahead of time, not saying it won't
18 remove as it does. They just may have to replace the
19 membranes more often.

20 Q Okay. Can we talk about each of the unit processes in a
21 line just so that we have them all correctly?

22 A Sure.

23 Q And if I'm wrong, feel free to correct me because I'm a
24 layperson And I consider you to be the person that we can
25 rely on to correct me. There's first a precipitation

1 step --

2 A Yes.

3 Q -- as the water comes in?

4 A Yes.

5 Q Okay. Then we move on to a series of filtrations?

6 A Correct.

7 Q Then we go to the first-run reverse osmosis?

8 A Yes.

9 Q Okay. And then there's a diversion of reject water from

10 that reverse osmosis system?

11 A Yes.

12 Q Okay. And then at point we raise the pH in the remaining

13 water?

14 A Yes.

15 Q And then we go through a second-run reverse osmosis system?

16 A Yes.

17 Q Now, you can't tell me that there is a system in Michigan

18 presently that uses these components to treat acid-rock

19 drainage; am I right?

20 A You're correct.

21 Q Acid-rock drainage And heavy metals is what we're talking

22 about.

23 A Correct.

24 Q So there's no system in Michigan for that presently?

25 A No, not that I am aware of.

1 Q And you can't tell me that there is a system in place in
2 this region of the country, the Midwest, a treatment system,
3 that handles acid-rock drainage or heavy metals in this kind
4 of system; am I right?

5 A Not that I know of.

6 Q In fact, you don't even know that there is a system anywhere
7 in the world that handles this kind of system in this
8 particular configuration or way?

9 A Not that I'm aware of.

10 Q And when you reviewed the system, you certainly weren't
11 aware of any similar treatments anywhere in the world to
12 handle this kind of -- this kind of drainage with the heavy
13 metals And acid.

14 A I guess not, no, if I'm understanding the question
15 correctly.

16 Q We really don't know whether this particular system will
17 actually work as configured, do we?

18 A Oh, I think that's -- I would disagree with that.

19 Q Well, let me ask you this: Do you know of a system in the
20 United States in a mine that uses reverse osmosis on a 24/7
21 basis?

22 A No.

23 Q And you know what I mean by 24/7?

24 A Yes, I do.

25 Q Operating 24 hours a day 7 days a week.

1 A Yes, I do.

2 Q You don't know a system that does this, do you?

3 A I didn't look at that, no.

4 Q Well, wasn't any part of your analysis to see whether or not
5 this particular configuration could work somewhere else?

6 A What I did was take the numbers I got for influent And look
7 at each unit processes separately And look at the effluent
8 from one process And assume that's the influent to the next
9 process And down the line. And my review included making
10 sure that this type of treatment could treat the wastewater
11 that is predicted And the parameters that are in the
12 wastewater as predicted.

13 Q Uh-huh (affirmative). My question, though, was, wasn't part
14 of your analysis to see if this kind of system -- similar
15 system was working anywhere in the world.

16 A I guess I -- each unit processes is working in many places
17 in the world.

18 Q Well, you indicate that each unit is used in other
19 applications somewhere in the world.

20 A Uh-huh (affirmative).

21 Q And I think that's -- I think that's fair. One that we --
22 that you've indicated, though, is that you can't tell me of
23 mine that uses reverse osmosis to treat water on a 24/7
24 basis, can you?

25 A I cannot.

1 Q And two of the steps that are involved in this process are
2 reverse osmosis systems. We have a first-run reverse
3 osmosis And a second-run reverse osmosis; am it right?

4 A Yes.

5 Q So those are steps that we know -- or we don't know whether
6 they're operating anywhere in the world in this application;
7 am I right?

8 A In this -- no, I guess.

9 Q Okay. We don't. Was this an issue that you raised with the
10 company, the fact that this system was unique?

11 A No, because each unit process isn't unique. They're all
12 very --

13 Q Again, I don't want to have to go through this with you
14 every single time. Okay? But we know that reverse osmosis
15 is not a system that is -- that you know of, at least, or at
16 that I know of is being utilized in any mine anywhere in the
17 world on a 24/7 basis.

18 A Uh-huh (affirmative).

19 MR. BRACKEN: Your Honor, I'm going to object. I
20 hope we can do this a little more quickly. We've all heard
21 her testimony, And she answered the question as to whether
22 she raised the issue And she's already -- And she repeated
23 herself that, no, because each unit process isn't unique.
24 So I don't know if we need to repeat -- we understand what
25 you're asking, Eric. And we understand what she's saying.

1 It seems to me it's just getting repetitive to ask that same
2 question over And over again.

3 MR. EGGAN: Well, I think I'm entitled to an
4 answer to these questions. This is a -- this is a system
5 that is unique, to say the least. And I think I'm entitled
6 to ask these questions. And I don't think I've taken a lot
7 of time.

8 MR. BRACKEN: It just strikes me that we shouldn't
9 have to repeat the question over And over again. We know
10 what her -- where her position is, And we're going to get --
11 I guess if you want the sound bites you can do that, but it
12 seems to me to be a -- it's going to take us a long time to
13 get through something that we -- you know, you're getting
14 the answer you want.

15 MR. EGGAN: Was the sound bite objection?

16 MR. BRACKEN: Yeah, sound bite objection. I
17 should have made it with -- on some other people who have
18 been here.

19 MR. EGGAN: Let me see if I can -- if I can --

20 JUDGE PATTERSON: Okay.

21 Q When we talk about the uniqueness of this system I'm talking
22 about all of these unit processes in one place operating
23 sequentially. Okay?

24 A Uh-huh (affirmative).

25 Q So we know that, since you can't tell us if there is another

1 mine operating like this anywhere, we know that it must be
2 unique.

3 A In line in the series that they're in, yes.

4 Q Okay. Or even operating together in the same place.

5 A I guess I'm not aware of --

6 Q Okay. And my question was, did you ask the company about
7 that issue?

8 A I didn't think it was necessary.

9 Q Okay.

10 MR. BRACKEN: See. Wasn't that better?

11 MR. EGGAN: Well, I think we got what I wanted,
12 so, yes, it was.

13 Q Did you request a pilot study?

14 A I did not.

15 Q Okay. And the permit was granted prior to anybody's receipt
16 of a pilot study?

17 A Yes, it was.

18 Q And have you seen a pilot study yourself since the
19 process -- since you left the Agency?

20 A I'm now aware that there was a pilot study, but I did not
21 receive --

22 Q And you didn't review it?

23 A No.

24 Q These two reverse osmosis systems that are part of this
25 unique configuration, they're a critical element of the

1 configuration, aren't they?

2 A Yes.

3 Q Have you done any studies to determine the fouling rate that
4 might be expected at this mine using this two-step reverse
5 osmosis system?

6 A That's an operational issue, And I think that's something
7 the company would need to address in the future when they're
8 operating the facility. My review was to determine whether
9 or not this process could treat this wastewater.

10 Q Well, I think that would be a good answer except that what
11 we're dealing with here is --

12 MR. BRACKEN: Can we not have your -- I object to
13 the argumentative part of that.

14 MR. EGGAN: Well, I haven't even asked a question
15 yet.

16 MR. BRACKEN: Maybe if you ask the question --

17 Q Okay. I understand your answer. But aren't we dealing here
18 with the potential of acid-rock drainage into the
19 environment? If the system doesn't work, there is a risk
20 that there will be acid-rock drainage into the environment;
21 am I right?

22 A If the system doesn't work you'd have untreated water that
23 something would have to be done with it, yes.

24 Q Okay. And wouldn't it be better to know how rather than
25 after the system is operating that the system isn't going to

1 be able to handle the influent?

2 A I think the system is going to be able to handle the

3 influent.

4 Q Well, I understand you have that belief based on your

5 experience, but my question would be, if the system isn't

6 going to be handle the influent, isn't it best to know now?

7 A I'm having a hard time with that question. Can you

8 rephrase?

9 Q All right. You've indicated that you didn't do any study to

10 get the fouling rate of the membranes --

11 A Correct.

12 Q -- in the reverse osmosis system.

13 A Correct.

14 Q Now, the membranes are part of the reverse osmosis system,

15 aren't they?

16 A Yes.

17 Q They're an important part. That's essentially what filters

18 out the bad stuff.

19 A Sure.

20 Q Okay. And you can't tell me -- maybe I should ask it this

21 way: Do you know what the size of the membranes are going

22 to be?

23 A Again, that's a final design type of question that you're

24 asking. And that can be addressed in the plans And specs in

25 the final design. My role was to review the basis of design

1 which is the basic, more conceptual type of treatment. So
2 the sizing of the membranes is going to depend on --

3 Q Do you have an understanding of what the life of a membrane
4 in a reverse osmosis system would be?

5 A It's depends on the -- it depends on the wastewater itself,
6 what it's pulling out.

7 Q Well, how long would the life of the membranes be in this
8 particular system?

9 A I don't know.

10 Q Do you know the kind of membrane that would be used here?

11 A I don't as a final design. That doesn't -- that doesn't
12 affect my decision as to whether or not reverse osmosis can
13 treat this wastewater.

14 Q Shouldn't the person who's making that decision know?

15 A I don't think so.

16 Q Okay. Now, you And Mr. Reichel talked about Exhibit 138.

17 MR. EGGAN: Could we have Exhibit 138 up on the
18 screen?

19 MR. REICHEL: And, Counsel, for the record, I
20 believe you're referring to Intervenor's 138?

21 MR. EGGAN: Yes, I am. This is Intervenor's 138.

22 Q And, Ms. Mariuzza -- did I say that right? -- Ms. Mariuzza
23 (pronouncing)? --

24 A Yeah.

25 Q -- we can see that this is a document that was apparently

1 provided to the MDEQ sometime in April of 2006.

2 A That's correct.

3 Q And what this document does -- And I'm going by your
4 description so I want you to tell me if I'm incorrect. But
5 what it does is it provides some of the expected recoveries
6 or the recovery rates that would be expected as the influent
7 goes through the wastewater treatment system.

8 A Yes.

9 Q Am I right?

10 A Yes.

11 Q At each of the unit processes?

12 A yes.

13 Q What I want to do is look at page 2 of the document. And as
14 you go down to the bottom of the document, we're talking
15 about an estimate of the first pass of the RO permeate
16 concentration.

17 A Yes.

18 Q And you see where it says "Basis," it says, "Recovery 75
19 percent."

20 A Yes.

21 Q Is that a recovery rate that you would expect?

22 A They give the equipment manufacturer's recommendation, so --

23 Q Well, that would have been my point.

24 A Yeah.

25 Q Did you go to the equipment manufacturer to talk to the

1 equipment manufacturer about how they actually reached that
2 recovery rate?

3 A They reached the recovery rates through actual data And
4 performance data of their systems.

5 Q My question is, did you go to the manufacturer to confirm
6 that 75 percent?

7 A Did I call the manufacturer?

8 Q Yes.

9 A No, I did not.

10 Q Did you make any inquiry of anyone with respect to that
11 particular recovery percentage?

12 A Nothing other than materials in the office.

13 Q And that's based on the equipment manufacturer's
14 recommendation for this particular permeate concentration;
15 am I right?

16 A Yes.

17 Q You think the equipment manufacturer's recommendation is
18 based on this specific permeate concentration or do you
19 think it's based on their recommendation as to all expected
20 constituents?

21 A I'd have to look at another table.

22 Q Do you have it in front of you?

23 A I might.

24 Q Go ahead.

25 A No, I don't. I don't have it up here with me.

1 Q All right. And did you look at that other table before you
2 decided to recommend this particular system?

3 A Yes.

4 Q Okay. My question is, what was done to determine whether
5 that 75 percent recovery rate was accurate?

6 A I probably took the fact that it was the equipment
7 manufacturer's recommendation And the spread sheet I'm
8 thinking about actually had a U.S. Filter letterhead or
9 whatever on it, so --

10 Q And that table would have said --

11 A -- I felt comfortable with those numbers.

12 Q -- would have said that U.S. Filter or whoever it is would
13 give a recommended recovery rate of 75 percent?

14 A Yes.

15 Q And you took that at face value?

16 A Yes, I did.

17 Q Didn't do any investigation to determine whether that was
18 accurate?

19 A Can't recall. I did do a lot of research reading water
20 treatment technology books And phone calls, but I can't
21 answer that for sure.

22 Q Okay. Now, you have been out to the proposed mine site,
23 haven't you?

24 A Yes, I have.

25 Q In fact, you testified to that earlier.

1 A Yes.

2 Q And I think as I looked through your materials, you had been
3 out there on more than one occasion?

4 A Yes.

5 Q And you know it's in the Yellow Dog Plain; right?

6 A Yes.

7 Q And you mentioned earlier -- And my guess is that you
8 were -- that you had mixed the two up. You said one was at
9 the sands plain, but what you really meant was the Yellow
10 Dog Plains.

11 A Right. I meant it's a sandy -- yeah; yeah.

12 Q Okay. The reason I said that is that there was another
13 witness who came in And drew a comparison to a plain called
14 the Sands Plain which is near -- which is in Marquette
15 County; am I right?

16 A I believe so.

17 Q But the area at this location where this facility is going
18 to go in, it's an area of woods And streams And rivers And
19 wildlife?

20 A Yes.

21 Q And we can agree that it is an environmentally sensitive
22 area, can't we?

23 A Somewhat, yes.

24 Q The orebody actually is over a river here -- excuse me --
25 under a river, isn't it?

1 A As far as I understand, yes.

2 Q And we really need -- we really need to get this wastewater
3 treatment plant, the configuration, we really need to get
4 that done correctly, don't we?

5 A Yes.

6 Q Because the wastewater treatment plant is really all that
7 stands between acid-rock drainage And this somewhat
8 sensitive environment that you've just confirmed?

9 A Well, the wastewater treatment plant, yes, will treat any
10 contaminated wastewater.

11 Q You indicated that Kennecott had somehow handled the issue
12 of sludge -- how they were going to handle the sludge. And
13 I'm recalling your e-mail to Mr. Maki where the issue of
14 sludge was an issue. You suggested to him that March 12th,
15 2006 e-mail to him mentioned the importance of sludge
16 handling.

17 A The May 12th e-mail?

18 Q Yes. Did I say March?

19 A Yeah.

20 Q I'm sorry. May. May 12th. How are they going to handle
21 sludge removal?

22 A The only thing I wanted it to say is I wanted them to
23 address that they were going to adequately characterize the
24 sludge And dispose of it as appropriate. That was what I
25 was looking for.

1 Q So they didn't come up with a plan that said, we're going to
2 specifically handle the sludge in this way or that way, did
3 they? What they said, was, "We're going to handle it
4 appropriately."

5 A Well, it depend -- I mean, are you talking about storage, or
6 are you talking about disposal? What are you asking me?

7 Q I'm asking you whether --

8 A Storage, they're going to have sludge storage facilities on
9 site, so they will be storing the sludge. And then they
10 will characterize it And they'll dispose of it where
11 appropriate. It depends upon the characterization of the
12 sludge where it will be disposed of.

13 Q Okay. They have indicated they're going to follow
14 applicable regulations?

15 A Correct.

16 Q But there is no -- they have not provided an operational
17 plan for how that's going to --

18 A Well, it depends on after it's characterized where it has to
19 be disposed of.

20 Q I understand. If it's hazardous, it has to be taken one
21 place; if it's not hazardous, it goes another place, that
22 sort of thing?

23 A Yes.

24 Q Ms. Mariuzza, as I understand it, Respondent's Exhibit 87
25 are comments that you gave to Mr. Maki in January of 2007?

1 A Yes.

2 Q And this is an e-mail that you wrote, or was it just
3 something that you printed out from your computer?

4 A I believe it printed it out And just gave him a --

5 Q What I'm asking is -- And I may not have heard this right
6 when Mr. Reichel was asking you these questions, but on that
7 first line where it says, "On or before 120 days prior to
8 operation of the Wastewater Treatment Facility, the
9 permittee shall submit a full set of WTF engineering designs
10 to the Department for review."

11 A Uh-huh (affirmative).

12 Q So that doesn't say "prior to construction," does it?
13 You're not going to review these plans or nobody at MDEQ is
14 going to review these plans prior to construction. It's 120
15 days prior to operation; am I right?

16 MR. REICHEL: Counsel, can I -- is the question
17 directed to what her recommendation was or what the permit
18 says?

19 MR. EGGAN: Well, I guess I'm going by the
20 recommendation, but by what's in this e-mail.

21 A I guess that is, yes, what that would -- that is what that
22 says.

23 Q Okay.

24 A I don't believe that's what's in the permit. I'd have to
25 look. But, yes, that's what the e-mail say.

1 Q Did you intend it to be "construction" -- "prior to
2 construction"?

3 A I think it was -- no. They have -- for review, I guess it
4 was intended to be an approval. So for review And approval,
5 so if it wasn't approved, then the permit -- the mining
6 permit wouldn't be effective if it -- 'cause it wouldn't
7 need a condition. But I believe that this was also followed
8 up in the permit And addressed correctly. So that might be
9 a misstatement on my --

10 Q Okay. All right. A question for you on a NPDES permit for
11 this site: Was there a point on your work on this project
12 that you believed that an NPDES permit was going to be
13 required for the discharges?

14 A There was never a time when I believed that, no.

15 Q Okay. Was that an issue you thought was worthy of
16 consideration? Was there discussion of it?

17 A There was a potential water discharge. Whether it was going
18 to be groundwater or surface water, at that time we didn't
19 know in the beginning.

20 Q Okay. And NPDES permit has not been required for the
21 discharges here?

22 A Not that I'm aware.

23 Q Why is that, if you can enlighten us?

24 A There isn't -- an NPDES permit is for a surface water
25 discharge, And there is no discharge to surface water.

1 Q Okay. And would that include the area of the seeps?

2 A That's a venting location, so --

3 Q Okay. And that is treated differently?

4 A Yes.

5 Q Okay. There was -- I saw some e-mail traffic between you

6 And Mr. Janiczek where you were talking about this distance

7 of 1,000 feet from the point of discharge.

8 A Yes.

9 Q Does that have an implication on the NPDES permit?

10 A Are those e-mails from early?

11 Q Yes, they are.

12 A I'm trying to just recall a time.

13 Q Yes, they are.

14 A Okay. This was when antidegradation was first being

15 discussed, And there's some -- 1,000 feet in the Part 22

16 Rules that relates to phosphorus. So eventually that

17 just -- we didn't even bother with it.

18 Q Did you not bother with an NPDES permit? Is that what

19 you're saying? Or did you not bother with the

20 antidegradation issue?

21 A No, we -- no, we -- instead of applying the 1,000 feet, we

22 said it doesn't matter, that the antidegradation -- they did

23 follow through with addressing that.

24 Q They did follow through with antidegradation?

25 A I followed through with, in my review, the part of

1 antidegradation I was supposed to look at.

2 Q And what did you conclude based on your antidegradation

3 analysis?

4 A What I had to look at was whether or not it was the best

5 treatment to treat the load of mercury, that additional.

6 Q Okay. And you concluded that it did?

7 A Uh-huh (affirmative).

8 Q Okay.

9 JUDGE PATTERSON: "Yes"? "Yes" or "no"?

10 THE WITNESS: Yes.

11 Q And that is part of your memo that I believe is December 8th

12 of 2006?

13 A December 6th; yes.

14 Q You know, that's an interested point, my memo says,

15 "December 8 of 2006."

16 A Oh, does it? This is a copy that I have. You can look at

17 it.

18 Q Actually I've seen both.

19 A Okay.

20 Q And they appear to be identical to me. I'm just wondering,

21 can you tell us what the -- what happened?

22 A Possibly what I did is typed it up And had that date. When

23 it was finalized by the secretary it may have been two days

24 later.

25 Q I see. Now, in your December 6th memo which is Respondent's

1 Exhibit 194 -- And I'm calling it December 6 even though
2 mine does say December 8. Okay? --

3 A Okay.

4 Q -- I'm looking at the area why talk about the best
5 technology And process And treatment?

6 A Yes.

7 Q And this is part of the antidegradation analysis.

8 A Yes.

9 Q They last line in the first paragraph on the third page
10 says:

11 "Reverse osmosis is one of the very technologies
12 that treat contaminants in the ionic range. This type
13 of treatment is widely utilized in the production of
14 drinking water for public consumption."

15 But again, for this particular project we know that reverse
16 osmosis is not utilized in mining applications at least on a
17 24/7 basis.

18 A What I was describing here was the fact that it treats water
19 to such a high quality that it is utilized for drinking
20 water. That's what I was --

21 Q Understood. Understood. But you were certainly relating it
22 to the wastewater treatment plant And the fact that the
23 wastewater them plant was utilizing this technology.

24 A I was talking about a technology that -- the best technology
25 that could remove mercury to the levels it needed to be

1 removed to. And again, you can't get much smaller than the
2 ionic range when you're treating the water.

3 Q Well, I guess what we're talking about is the best
4 technology that we're not certain works in this application.

5 MR. BRACKEN: Objection; argumentative.

6 MR. REICHEL: Join in the objection. The witness
7 has not testified that she's not certain that it works in
8 this application. She's testified to the contrary.

9 MR. BRACKEN: In fact, there's no testimony in
10 this record, as far as I know, that says that it doesn't
11 work with this.

12 MR. EGGAN: I think you may want to go back And
13 look at some of the other testimony in this matter, but we
14 can leave it at that.

15 Q Did somebody go through the entire degradation analysis And
16 analyze social benefit versus economic benefit?

17 A That was not my review.

18 Q Do you know who did do that?

19 A I believe -- I don't, I guess, no. I'm not going to say a
20 name if I'm wrong.

21 Q Understood.

22 MR. EGGAN: If I could have just a minute, your
23 Honor?

24 JUDGE PATTERSON: Sure.

25 MR. EGGAN: I don't have any other questions, your

1 Honor. Thank you.

2 MR. REICHEL: Just a few follow-up points, Ms.
3 Mariuzza.

4 REDIRECT EXAMINATION

5 BY MR. REICHEL:

6 Q Mr. Egan asked you a series of questions earlier about a
7 scenario under which the volume of wastewater was
8 hypothesized to exceed the design capacity. Do you remember
9 that line of questioning?

10 A Yes.

11 Q Again, you've testified that you reviewed the permit as
12 issued -- correct? -- the groundwater discharge permit?

13 A Yes.

14 Q Do you recall whether or not the permit as issued
15 established an upper limit on the quantity, the volume of
16 wastewater that may be discharged on a --

17 A Yes. 350 gallons per minute or -- is it 500 -- around 500
18 gallons per day -- 500,000 gallons per day.

19 Q Okay. So given that, is it your understanding that the
20 permit does not authorize any discharge above that amount;
21 correct?

22 A Correct; correct.

23 Q And I believe you touched on this, but is it your
24 understanding that if a situation arose where Kennecott
25 proposed to or sought to treat --

1 MR. EGGAN: Your Honor, could this redirect be by
2 non-leading questions?

3 MR. REICHEL: Okay. I'll try to rephrase it,
4 Counsel. I was trying to set a background, but okay.

5 Q Do you have any understanding of what Kennecott would have
6 to do if they wanted to or felt it necessary to discharge
7 more than 350 gallons per minute?

8 A They would have to apply for a modification to their
9 discharge permit.

10 Q And based upon your review of the materials that you've
11 looked at in connection with this process, if the situation
12 arose where the volume of water estimated -- excuse me.
13 Strike that. If a situation arose where the quantity of
14 water that needed to be handled -- And particularly mine
15 influent water --

16 A Uh-huh (affirmative).

17 Q -- does the permit authorize Kennecott to discharge that
18 water without -- in excess of the 350 gallon limitation?

19 A No.

20 MR. EGGAN: I'm going object to the foundation of
21 the question. My questions related to the amount of water
22 going into the system which is what the wastewater treatment
23 plant is designed to accept. The question would suggest
24 that the amount going into the treated water infiltration
25 system is that amount And that the amount discharged is

1 going to exceed that amount, And those are two different
2 distinct issues.

3 MR. REICHEL: Well, I can try to rephrase the
4 question, but I believe the questions on cross have raised,
5 among other things, the specter of some scenario under which
6 the contact water basins were going to over top or that
7 somehow these permits were going to allow Kennecott to
8 discharge whatever amount of water they wanted to in the
9 environment. I think that was certainly the inference or a
10 suggestion.

11 MR. EGGAN: It is. It is.

12 MR. REICHEL: And I'd like to -- And I'll to
13 address that.

14 MR. EGGAN: Okay.

15 MR. BRACKEN: I join in the explanation. I think
16 that you can't have one without the other. I think they're
17 certainly totally connected. If you can't treat it -- Mr.
18 Reichel's question is, you can't discharge it either. So
19 something else has to happen I think is --

20 Q Let me try to restate the question.

21 A Okay.

22 Q I want you to assume hypothetically that a situation were to
23 arise where the volume of water from -- that is going into
24 the contact water basin exceeded the rate of 350 gallons per
25 minute. What would happen as the system is designed now?

1 A Well, as it's designed, there is -- you know, it was
2 designed for a much larger volume of water for the contact
3 basins. I think I said earlier that that would provide some
4 equalization. There's several days of storage available,
5 but then there's contingencies in place also.

6 Q Okay. And in terms of contingencies, let's assume that
7 under some hypothetical scenario there was such an
8 exceedance of the estimated inflow to the contact water
9 basins for such a length of time, that at some point it
10 would exceed the hydraulic capacity of the contact water
11 basin. As you understand, the way the permit is structured,
12 would Kennecott be then authorized as to allow the contact
13 water basins to overtop?

14 A No. That's why there's contingencies in place to reroute
15 the water for storage.

16 Q And do you have some understanding as to what the ultimately
17 contingency would be; that is, if there was more water than
18 Kennecott could manage, again, hypothetically, with the
19 infrastructure that's currently described in the permit,
20 where would that water have to go?

21 A The TDRSA, temporary development rock storage area, up to --
22 there's a limit on how much water can be stored on that, And
23 also in unused portions of the mine if that was necessary.
24 That's what the application referred to.

25 Q But again, as you understand the permit that's been issued,

1 is there any scenario under which it authorized an
2 overflowing of the contact water basins?

3 A No. That would be a violation of Part 31.

4 Q Mr. Eggan asked you a whole series of questions about --
5 directed to the proposition -- oh, strike that. Mr. Eggan
6 asked you about whether you had knowledge of any other
7 treatment system for wastewater from a mine treating
8 acid-rock drainage.

9 A Correct.

10 Q Whether you were aware of a system anywhere that has this
11 particular treatment configuration proposed here; correct?

12 A Right.

13 Q And you indicated you are not aware of such a system?

14 A Correct.

15 Q Let me ask you this: Based upon your training And
16 experience And the investigation of this if it is a part of
17 your permit review, have you reached any understanding as to
18 whether or not the elements, the individual unit processes
19 proposed And included in the basis of design are
20 demonstrated technologies?

21 A All of them are; yes.

22 Q And, if you know, have these technologies or combinations of
23 these technologies been used in other non-mining industrial
24 settings?

25 A Yes.

1 Q And based on your training And experience in environmental
2 engineering, do you have any reason to believe that the --
3 let's say the copper or the nickel that is expected to be
4 present in the wastewater at issue here is somehow less
5 treatable because it comes from a mine than copper or nickel
6 that comes from some other industrial process?

7 A It's the same.

8 Q And, again, to the extent that the treatment system proposed
9 here is expected to treat acids or acid-forming compounds
10 that may be present in the wastewater, do you have any
11 reason to believe that those compounds because they come
12 from a mine are somehow less treatable than they would be
13 from some other industrial source?

14 A I have no reason to believe that, no.

15 Q Mr. Egan asked you about whether or not you were aware or
16 whether a pilot study was this particular proposed treatment
17 configuration had been performed, And you testified that
18 other than hearing a reference or seeing a reference, I take
19 it, in a transcript over a prior witnesses' testimony,
20 you're not aware of any such pilot study for this system;
21 correct?

22 A Correct; right.

23 Q Let me ask you a slightly different question, but I think
24 it's somewhat related. Again, you've testified that you've
25 reviewed the permit, the Part 31 permit, as it was issued in

1 this case; correct?

2 A Yes.

3 Q And do you recall whether or not in the terms of that permit

4 there are any requirements in the initial phase of operation

5 about what the permittee must do in terms of treatment

6 before they're actually authorized to discharge treated

7 water through the so-called TWIS or treated water

8 infiltration system?

9 A Yeah. Can you repeat that? I'm sorry.

10 Q Sure. I'm sorry. That was a badly worded question. Let me

11 start over. You're familiar with the groundwater permit.

12 A Right.

13 Q Do you recall whether or not -- And if you need to look at

14 the permit, I can do that to assist you -- I'm taking about

15 the groundwater permit.

16 A Uh-huh (affirmative).

17 Q Is there any provision in the permit for it during the

18 period of initial operation under which Kennecott or the

19 operator would be required to operate the system for some

20 period of time, the treatment system, before they actually

21 discharge effluent into the groundwater?

22 A Yes. Yes. And I don't know exactly where it is. It would

23 be helpful I could look at it, if you --

24 Q Certainly.

25 MR. REICHEL: Can we bring up the groundwater

1 discharge permit. I believe it --

2 A I have the permit here, so --

3 MR. REICHEL: Okay. I believe it's -- for the

4 record, it's Respondent's Exhibit 118, I think. Presumably

5 the judge And counsel don't have it in front of them. Could

6 you bring that up, please?

7 Q Direct your attention to -- turn to page 4 of 32, please.

8 A I see it here.

9 Q And specifically under the heading of "Specific

10 Conductance," do you see a paragraph sub (b)?

11 A Uh-huh (affirmative).

12 Q Take a moment to read that And tell me if that refreshes

13 your recollection?

14 (Witness reviews exhibit)

15 A Yes.

16 Q And without necessarily reading it, what, in substance, does

17 this provide in regard to the question I asked you earlier?

18 A Earlier we talked about the specific conductance, And you

19 have a certain effluent quality, And then you calibrate the

20 meter to meet that so that it correlates with -- the

21 effluent quality And the specific conductance, there's a

22 correlation between the two. What this will do is the

23 wastewater, while it's being calibrated And they're running

24 the system, they'll actually be looping the discharge

25 through back to the head of the system while they're working

1 this all out before they start discharging to the
2 infiltration beds. And it just -- let me look quick here.

3 (Witness reviews document)

4 A Okay. So they must submit the written verification And
5 everything to the Department prior to discharging to the
6 infiltration beds. So we talked about that calibration of
7 that meter earlier.

8 Q Right. But in this case though, is it your understanding,
9 having refreshed your recollection that under the terms of
10 the permit, they have to do this -- actually run the system
11 And do this calibration process before wastewater actually
12 goes into the ground?

13 A Yes.

14 Q Shifting back over for a moment to the mining permit, Mr.
15 Eggan asked you about a recommendation you had made about --
16 in one of your documents, I believe it was your January 2007
17 draft permit conditions, where you made a recommendation
18 with respect to establishing or requiring Kennecott to
19 submit engineering plans for the wastewater treatment plant
20 at some point; do you recall that?

21 A Right.

22 Q And direct your attention to the mining permit that is the
23 Part 631 permit.

24 MR. LEWIS: 632.

25 MR. REICHEL: 632. I don't know what it is. I --

1 thank you, Counsel.

2 (Off the record)

3 MR. LEWIS: Sorry for that.

4 MR. REICHEL: One of those exciting areas of the
5 law; right? Sorry. But thank you for the correction.

6 Q The mining permit which is DEQ Exhibit 117, I believe, And
7 then the section that deals with water management And
8 treatment And the special conditions section H And then
9 subparagraph (21) which appears at page 14 of the mining
10 permit as issued, what does that indicate with regard to the
11 requirement of engineering plans And how that -- And when
12 that is supposed to occur?

13 A Can you tell it over here.

14 Q Page 21?

15 A Yeah. It says, "prior to construction," And they must
16 receive written approval from the Department before
17 construction.

18 MR. REICHEL: That's all I have. Thank you.

19 MR. BRACKEN: There may be a few questions, your
20 Honor, although Mr. Reichel's covered --

21 (Counsel reviews notes)

22 CROSS-EXAMINATION

23 BY MR. BRACKEN:

24 Q At one time I thought your answers to Mr. Eggan's questions
25 you had trouble finding a word, And we were talking about

1 whether water would be treated in the metal hydroxide
2 precipitation process. Some of those metals would also be
3 treated in a reverse osmosis process. Would it be fair to
4 characterize that as there's some overlap that both
5 processes treat And would remove certain metals from the
6 water?

7 A Yes.

8 Q That would have been a word to use that you guys were
9 searching for?

10 A Yeah; yes. Yes, that is a good way to explain it.

11 Q So that even if -- I'll withdraw that. So it's your
12 testimony that use of these unit processes And different
13 applications in a mine isn't as important as the fact that
14 the chemistry in the water is what's at issue, not where the
15 source of the water is?

16 A Correct.

17 Q So the processes that you approve based on your experience,
18 training And your investigation could you demonstrate --

19 MR. EGGAN: Again, your Honor, I'm going to have
20 to ask that this -- what is something like redirect be done
21 through non-leading questions.

22 MR. BRACKEN: I'll they're to rephrase it.

23 JUDGE PATTERSON: Okay.

24 Q You've testified that you reviewed these processes that were
25 proposed; correct?

1 A (No verbal response)

2 Q You have to say "yes" or "no."

3 A Yes. Sorry.

4 MR. EGGAN: Again, that's a leading question.

5 Q Okay. Did you review the literature as well?

6 A Yes.

7 Q And did you come to a conclusion about these treatment

8 processes And other applications in a mine?

9 A I'm trying to figure out the right way to say this. The

10 influent, I guess -- I don't think when you're looking at

11 the treatment proposed, it doesn't -- I don't want to say it

12 doesn't matter, but it doesn't matter where the influent

13 comes from. It's the parameters that are in it. You know,

14 so I think it could be from any application because the

15 technology will treat these numbers whether it's from a mine

16 or a paper mill or where it's coming from. It's the

17 technology treating what's in the water And the constituents

18 in the water.

19 Q Ultimately if the treatment technologies don't work, are

20 there things in the permits that prevent water that doesn't

21 comply with the requirements from being discharged? Do you

22 know that?

23 A I don't know.

24 Q What would happen if specific conductance would show that

25 the water that's been treated doesn't meet the standards?

1 A The water can be rerouted to the head of the plant, the
2 same way that they were during that initial operation
3 calibration when they treated the wastewater. It would be
4 rerouted to the head of the plant.

5 Q Do you know whether the permit would require Kennecott to
6 modify or revise the plant, change the plant if it wasn't
7 meeting with discharge standards?

8 A Yes.

9 MR. BRACKEN: I have no further questions, your
10 Honor.

11 MR. EGGAN: Just a question or two on recross.

12 RECROSS-EXAMINATION

13 BY MR. EGGAN:

14 Q How many days of storage are there under Kennecott's plan in
15 the contact water basin?

16 A I believe it's 14 days.

17 Q Okay. And then it's supposed to -- if there is overflow,
18 it's supposed to go to the TDRSA area?

19 A Yes.

20 Q And what's the capacity of that?

21 A I am not aware. That was not reviewed by me.

22 Q Okay. How long would it take before the system would start
23 overflowing?

24 A It depends on the flow going into --

25 Q Well, let's say at 500 gallons per minute?

1 A I don't have those numbers in front of me.

2 Q Did you do that calculation as part of your work?

3 A Boy. You could do that calculation, I guess, with several
4 different numbers. So I didn't run different numbers
5 through it, no.

6 Q Did you run any numbers to determine how long it would take
7 for the system to overflow?

8 A I know how many days of storage there were, And I know
9 there's contingencies in place to handle additional flow.

10 Q Well, the contingency to handle additional flow is for water
11 to leave the contact water basins And go into the TDRSA.

12 A Aure.

13 Q But you don't know how long or what the capacity is of the
14 TDRSA area; am I right?

15 A I don't.

16 Q And if there was -- if there were a major event where one of
17 the reverse osmosis systems went down And replacement parts
18 has to be ordered from somewhere across the world, you don't
19 know how long that might take?

20 A I guess you don't know how long that would take. But that's
21 why there was the several days of storage in the contact
22 water basins And there's contingencies in place. They
23 followed the requirements of the rule And that's what they
24 needed to do.

25 Q Now, you say that the water can be rerouted through the

1 system as one of the contingencies in case things break
2 down. Water can be rerouted. But again, that's just adding
3 additional water to a system that may be already at or above
4 capacity, isn't it?

5 A At or above capacity? They can reroute it to the head of
6 the plant where again there's equalization, there's storage
7 capacity available.

8 Q Okay. But if we have a situation where water is continuing
9 to flow in from mining operations, And we have this --
10 rather than an outlet, allowing water to leave the system,
11 we have water being rerouted back into the system, that's an
12 additional load to a system that is already designed at a
13 certain maximum capacity; am I right?

14 A That's why there's contingencies in place.

15 Q Understood. Understood. But you didn't do the
16 calculation --

17 A I didn't.

18 Q -- to determine how long that contingency would go.

19 A I didn't.

20 Q You indicated that you reviewed the literature with respect
21 to the various components of the unit processes.

22 A Sure.

23 Q And that literature, I believe you indicated, was the
24 manufacturer's literature?

25 A What was supplied, yes.

1 Q You didn't go beyond that material?

2 A We have information in the office, you know, general
3 information, textbooks. So I did read up on the different
4 processes, yes.

5 Q And with the additional information you read, did that
6 confirm for you that these recovery rates were accurate?
7 Would they have been able to give you that kind of
8 information?

9 A I guess I was comfortable with the numbers that were
10 provided, so there was nothing that I read that would negate
11 what they gave me that I can recall.

12 Q You were comfortable with the numbers but didn't contact the
13 manufacturer to get additional data?

14 A I didn't because it came on -- with their heading on the --
15 so I -- the information came with the manufacturer's heading
16 on the paperwork. I guess that's the right word.

17 Q Okay. So as long as the manufacturer -- it comes on the
18 manufacturer's documentation indicating that this is what
19 the expected recovery rate is, you didn't question it?

20 A Correct.

21 MR. EGGAN: Okay. I don't have anything else.

22 MR. REICHEL: I just want to follow up one more
23 time, I hope.

24 REDIRECT EXAMINATION

25 BY MR. REICHEL:

1 Q This line of questioning that Mr. Eggan asked about,
2 contingencies, based upon your review of the application
3 materials, in terms of -- what do you understand -- the
4 wastewater treatment is designed to handle water from
5 various sources; correct?

6 A Right.

7 Q And is one of those sources water from the mine?

8 A Yes.

9 Q Dewatering?

10 A Yes.

11 Q I believe Mr. Eggan asked you in follow-up to my questions
12 about the fact that one of the stated contingency was
13 putting water up to a certain amount -- wastewater up to a
14 certain amount in the TDRSA; correct?

15 A Right.

16 Q And then I guess the implied or stated question was, what
17 would happen next?

18 A Right.

19 Q Again, what do you understand would be the next contingency?
20 Would it be allowing it to -- the water to flow over top --

21 A No.

22 Q -- the contact water basin?

23 A No. It would -- you'd have to cease operations And stop
24 pumping water.

25 Q Correct. And leave the water in the mine.

1 A Right; right.

2 MR. REICHEL: Thank you. Nothing further.

3 THE WITNESS: I feel like I'm missing something.

4 MR. REICHEL: I'm sorry if my question wasn't

5 clear. That's all I have.

6 THE WITNESS: Okay.

7 MR. BRACKEN: Nothing further.

8 MR. EGGAN: Nothing further, Judge.

9 JUDGE PATTERSON: Thank you. It's my

10 understanding that's the only witness for today.

11 MR. REICHEL: That's correct. As a scheduling

12 matter, that's just the way it panned out.

13 (Proceedings concluded at 12:11 p.m.)

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