

STATE OF MICHIGAN

STATE OFFICE OF ADMINISTRATIVE HEARINGS AND RULES

<p>3 In the matter of:</p> <p>4 The Petitions of the Keweenaw Bay Indian Community, Huron 5 Mountain Club, National Wildlife Federation, and 6 Yellow Dog Watershed Environmental Preserve, Inc., 7 on permits issued to Kennecott Eagle Minerals Company. 8 _____/</p>	<p>File Nos.: GW1810162 and MP 01 2007</p> <p>Part: 31, Groundwater Discharge 632, Nonferrous Metallic Mineral Mining</p> <p>Agency: Department of Environmental Quality</p> <p>Case Type: Water Bureau and Office of Geological Survey</p>
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D R A F T T R A N S C R I P T

HEARING - VOLUME NO. XXVI (26)

BEFORE RICHARD A. PATTERSON, ADMINISTRATIVE LAW JUDGE

Constitution Hall, 525 West Allegan, Lansing, Michigan

Thursday, June 12, 2008, 8:30 a.m.

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 transcript.

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1 Lansing, Michigan

2 Thursday, June 12, 2008 - 8:35 a.m.

3 MR. LEWIS: A couple things, your Honor, of
4 housekeeping.

5 JUDGE PATTERSON: Okay.

6 MR. LEWIS: Yesterday I had offered a series of
7 ASTM standard exhibits. And I think Petitioner's counsel
8 had all stipulated with the exception Mr. Wallace and been
9 informed by Mr. Wallace that he has reviewed those and
10 apparently has no objection to their objection.

11 JUDGE PATTERSON: The holdout has caved.

12 MR. WALLACE: I've succumbed.

13 MR. LEWIS: So to restate for the record, those
14 are Intervenor Exhibit Numbers 58 and 61 through 70.

15 JUDGE PATTERSON: Okay. There being no objection,
16 now at this point they will be entered.

17 (Intervenor's Exhibits 58 and 61 through 70
18 received)

19 MR. LEWIS: And one other thing I wanted to take
20 care of before I forget, your Honor, and that's the
21 deposition of David Sainsbury. It's been several days ago
22 now we discussed that deposition. And as you may recall,
23 there was some discussion about one of the exhibits to the
24 deposition, that being Exhibit 11. I believe counsel agreed
25 that the exhibit -- based on the court rulings that the

1 deposition exhibit, which would be offered and admitted is
2 the transcript itself with all of the exhibits except
3 Exhibit 11. And we've made that transcript in that form
4 Intervenor 626. And I believe that there's no objection.

5 MR. HAYNES: No objection.

6 MR. WALLACE: Just the continued question
7 regarding the denial of the admission of Exhibit 11.

8 JUDGE PATTERSON: Okay.

9 MR. HAYNES: That's what I meant, your Honor. No
10 objection to the current form understanding that we objected
11 to the omission of Exhibit 11.

12 MR. LEWIS: If I may, again so I don't neglect,
13 here's the exhibit. There's also the video version, so
14 whichever form you'd like to review, your Honor.

15 JUDGE PATTERSON: Give me some late night reading.

16 MR. LEWIS: Or video viewing. Take your wife to
17 the movies. And that's all I had to take care of then.

18 (Intervenor's Exhibit 626 received)

19 MR. REICHEL: Your Honor, with respect to Mr.
20 Council, we have no questions at this time but again reserve
21 our right to ask him questions based upon cross-examination.

22 JUDGE PATTERSON: Mr. Egan, are you up first?

23 MR. EGGAN: I am, your Honor. And you'll be happy
24 to know that I did use those 11 minutes and I am going to
25 prune back my cross-examination substantially.

1 JUDGE PATTERSON: Sometimes it goes the other way
2 when you have too much time.

3 MR. EGGAN: See, it does sometimes. Mr. Council,
4 my name is Eric Eggan. And I represent Petitioners in this
5 matter primarily on groundwater-related issues pertaining to
6 Part 31. And I have a few questions for you this morning.

7 CROSS-EXAMINATION

8 BY MR. EGGAN:

9 Q If it's okay with you, I'd like to talk about the various
10 models that have been done in this case. And we'll kind of
11 put into the record sort of a history of those models. By
12 my count, there are three companies who have modeled mine
13 dewatering. And let's see if we can kind of look at this
14 together. The first would have been Golder, who did
15 modeling related to mine dewatering in the bedrock; am I
16 right?

17 A Yes.

18 Q Okay. And we know that they did the 2005 preliminary
19 modeling. And I'm sure you've reviewed that?

20 A I looked at that.

21 Q Okay. And they did a 2006 supplemental modeling; right?

22 A Yes.

23 Q And then they also did another supplemental model in 2008,
24 and you've reviewed all of those?

25 A Right. I guess -- I think the 2006 model is an update. I

1 don't know if it's a supplement. It was an update of the
2 original model.

3 Q Okay. And to be -- to make the record clear, I think they
4 testified that the 2008 was an update, too?

5 A Yes.

6 Q Okay. Then we had the Fletcher Driscoll model, which was
7 also done, I believe, in 2005?

8 A Yes.

9 Q And you testified that you reviewed that model?

10 A Yes.

11 Q And then we have you doing modeling mine dewatering in the
12 quaternary aquifer; right?

13 A I did. I didn't model mine dewatering but rather just to be
14 clear the impacts in the quaternary aquifer due to the mine
15 dewatering as predicted by Golder.

16 Q I understand.

17 A And generally speaking, the same is true for the Fletcher
18 Driscoll models.

19 Q Okay. Now, a few questions about those modeling efforts.
20 Okay. Golder used FEFLOW modeling, didn't they?

21 A That's correct.

22 Q Okay. And Fletcher Driscoll used what's called MODFLOW,
23 didn't they?

24 A Yes.

25 Q And you, too -- you also used MODFLOW?

1 A Yes.

2 Q Okay. Now, with respect to the kind of modeling that was
3 done, it's my recollection that Golder used transient
4 modeling for its modeling. For the 2005, the 2006 and 2008,
5 those were all what are what's called transient; correct?

6 A That's right.

7 Q Okay. Fletcher Driscoll's modeling was steady state, wasn't
8 it?

9 A The 2005 modeling, the calibration model, was steady state.

10 Q Was steady state?

11 A Yes.

12 Q Okay. Good. And the modeling that you did was also steady
13 state?

14 A Yes.

15 Q Okay. Now, we also have three companies doing modeling near
16 the TWIS; am I right?

17 A Yes.

18 Q Okay. And that again is Fletcher Driscoll in 2006; correct?

19 A Yes.

20 Q Golder in 2006; correct?

21 A Yes.

22 Q And then you in 2008?

23 A Yes.

24 Q And they applied those same modeling techniques. We had
25 Fletcher Driscoll using MODFLOW and transient state --

1 excuse me -- Fletcher Driscoll using MODFLOW and steady
2 state, Golder using FEFLOW --

3 A No. I think Fletcher Driscoll used the transient model for
4 prediction of TWIS.

5 Q All right. I'm getting ahead of myself. Let me just --
6 we're talking Fletcher Driscoll. And they used steady
7 state, didn't they?

8 A Fletcher Driscoll used steady state for the calibration
9 analysis. But when they did prediction analysis, they used
10 a transient model.

11 Q Transient. Okay. Good.

12 A And to the extent you're talking about the TWIS, that was --
13 you're talking about predictions.

14 Q Exactly; exactly.

15 A So that was a transient.

16 Q I'm trying to be accurate, and I'm glad for your comments.
17 And, again, the modeling that you did, you also did some
18 modeling related to that TWIS infiltration?

19 A Correct.

20 Q Okay.

21 A I think you indicated that they used different codes in your
22 question?

23 Q Yes; yes.

24 A And I didn't look at the Golder TWIS model. I don't believe
25 they used FEFLOW. So I think they may have all been

1 MODFLOW, although I can't say for certainty because I didn't
2 look at the Golder.

3 Q Okay. So you didn't look at that Golder model that was done
4 on the TWIS modeling?

5 A I didn't review it.

6 Q And don't we also have two companies doing modeling of the A
7 and D aquifers? We have Fletcher Driscoll in 2006; correct?

8 A Correct.

9 Q And then was your modeling also in the A and D aquifers?

10 A Yes.

11 Q Okay. Just a few questions about the report that you
12 prepared. I noted in your report dated April 1 of 2008, you
13 indicate in the first paragraph that your modeling is a work
14 in progress. And you say that the modeling will be updated
15 and the results presented will be modified. Was the work
16 that you did as of April 1 updated, as you indicated it
17 would be?

18 A Not as yet, no.

19 Q Okay. And the results then have not been modified since the
20 report was prepared?

21 A No, they have not.

22 Q Okay. Do you have a plan to do that at some point?

23 A Generally, yes, but no specific work plan.

24 Q Now, it's my understanding that, while you did prepare this
25 report on April 1 of 2008, this report has not been

1 presented to the Department of Environmental Quality?

2 A Only in the giving out of the exhibits.

3 Q Okay. To these proceedings and the sharing of exhibits, it

4 has been shared with MDEQ, but it hasn't been presented to

5 them in any official sense as of the application process?

6 A That's right.

7 Q Okay. And to your knowledge, you haven't gotten any review

8 or feedback?

9 A I have not other than my colleague -- internal review from

10 GeoTrans.

11 Q Okay. I guess what I meant was no review or feedback from

12 the DEQ?

13 A That's correct.

14 Q In any event, we can certainly agree that this April 1

15 report was not part of the process that led to the approval

16 of the permit -- the initial approval of the permit by the

17 Department of Environmental Quality in May 2007?

18 A Yes.

19 Q I'm looking at page 4 of your report now. And I'm seeing,

20 in the first full paragraph on page 4, the last line says --

21 and you were talking about water budget at the time. You

22 say that you know that there is significant uncertainty in

23 the water budget and it was really intended to give a sense

24 of the approximate magnitude of flow. Is that still true?

25 A Yes.

1 Q So at this point, what we're dealing with is a water budget
2 estimate?

3 A Yes. Not based on modeling but just based on the data.

4 Q Understood. And there's a -- because of that uncertainty,
5 there has to be a certain amount of uncertainty built into
6 your model?

7 A That's right.

8 Q Now, I'm looking at -- you put the total amount of ET, which
9 is, I believe you called that evapotranspiration.

10 A Evapotranspiration.

11 Q Transpiration, yes. And you estimated that to be 720
12 gallons per minute. Given your apparent uncertainty about
13 the water budget, is that number also uncertain?

14 A It is.

15 Q I'm moving on now to page 9 of your report. And I'm looking
16 at the summary and conclusions in that report. And I just
17 want to underscore some language that you used and that is,
18 "No attempt is made in this analysis to define a most
19 conservative or a worst case scenario." So your modeling
20 did not attempt to model a worst case scenario?

21 A That's right. I looked at a reasonable case and using a
22 reasonable estimate -- in fact, the best estimate of mine
23 inflow and, as I mentioned yesterday, a variety of different
24 reasonable sets of calibration parameters to try to come up
25 with a sense of the uncertainty.

1 Q I understand that. And we might disagree on whether you
2 should or you shouldn't have used a worst case scenario.
3 But in any event, you didn't do one?

4 A Correct.

5 Q Okay. And you also made no attempt to define a most -- a
6 most conservative scenario either?

7 A Yes. The same thing, I think. Worst case.

8 Q You define the term "conservative" to be the same as worst
9 case?

10 A They're very similar. I would say, yes. There are however
11 conservatisms built into various models that are used.

12 Q Well, I heard you testify about that. I'm just going by
13 this line that says that "no attempt was made in this
14 analysis to define a most conservative or a worst case
15 scenario." And that statement still stands?

16 A Yes.

17 Q You also say -- and this is that last line in that part --
18 "Also this analysis does not show what the change in wetland
19 surface water level will be." So again you admit that there
20 is a certain amount of uncertainty in the predictions of
21 this model?

22 A Right. The sentence goes on to say, "It could be
23 substantially less than the change in the aquifer."

24 Q Understood. And that's something that you testified about
25 yesterday?

1 A Right.

2 Q What I'm focusing on is the language that you used yesterday
3 that modeling -- perhaps to a person like you that deals
4 with this every day, you recognize that modeling just is
5 not -- is not something that provides finite results. It
6 gives us more of an educated analysis of an educated
7 possibility as to what may happen?

8 A Generally speaking, I agree.

9 Q Okay. A question that I have -- and there is a memorandum
10 that is known to -- with the lawyers in this case and we'll
11 be talking about this memorandum later with one of the DEQ
12 exhibits that -- one of the DEQ people said at one point
13 that really modeling is really more of an art than a
14 science. Do you agree with that?

15 A I think there is art and science in modeling, yes. I
16 wouldn't more than art than science. I'd say it's some of
17 both.

18 Q Okay. When we're talking about modeling, is it also true
19 that modeling results can be tweaked or modeling itself can
20 be tweaked to reach a desired result?

21 A Could be. But there are standards and practices that you go
22 about to ensure that the changes in parameter values -- I
23 assume that's you're talking about -- inputs in models are
24 reasonable and that you've tested reasonable ranges of
25 those.

1 MR. EGGAN: I don't think I have anything else.
2 Thank you, Doctor.

3 MR. HAYNES: Mr. Council, my name is Jeff Haynes.
4 I represent the National Wildlife Federation and the Yellow
5 Dog Watershed Preserve. I have a few follow-up questions
6 from Mr. Egan's questions and a few of my own.

7 CROSS-EXAMINATION

8 BY MR. HAYNES:

9 Q If we could put your report just so we can track the
10 language, because I have a couple of questions about your
11 April 1, 2008, report, which is Kennecott Exhibit 591. If
12 we can go to page 3 of the report, please. Mr. Council, you
13 have your technical memorandum in front of you?

14 A I do.

15 Q Turn to page 3, the first full paragraph. The second
16 sentence of that paragraph says, "Consequently it is
17 appropriate in this analysis of quaternary system responses
18 to ignore the natural flow into and/or out of the bedrock."
19 Do you see that?

20 A Yes.

21 Q So in your model, you've simply ignored any natural flow in
22 the bedrock as opposed to the precipitation that was the
23 basis for the water budget; correct?

24 A Yes. What we're saying here is that, because of the
25 conductivity contrast, as is commonly done in modeling, it's

1 appropriate to assume basically a no-flow boundary on the
2 bottom of that quaternary system.

3 Q So you ignored flow that may be going from the bedrock to
4 the quaternary system and vice-versa?

5 A The natural flow, not counting the mine inflow that we did
6 model specifically.

7 Q Understood.

8 A Because that -- because that flow would be quite small
9 compared to the normal flows going in the quaternary system,
10 that flow was ignored, yes.

11 Q Not trivial but small?

12 A Very small.

13 Q Measurable? Would it be measurable?

14 A I'm not sure about that.

15 Q So that's an uncertainty in your analysis; correct? By
16 ignoring that natural flow?

17 A Probably not a big one.

18 Q But an uncertainty?

19 A Yes.

20 Q Okay. Let's go to page 4. Mr. Eggan asked you -- in the
21 first full paragraph, the last sentence, where you say,
22 "There's a significant uncertainty in this water budget
23 estimate." Do you see that?

24 A Yes.

25 Q And when you say there is an uncertainty -- not just an

1 uncertainty, a significant uncertainty in your water budget
2 est, that uncertainty tends to drive the end result into a
3 greater range of uncertainties, doesn't it? That is, if you
4 have uncertain inputs, that tends to make the outputs less
5 certain as well?

6 A Well, let me be clear about this, because this water budget
7 analysis was kind of done pre-model. And it was just to get
8 a sense of what the water budget might be. Uncertainty that
9 may have been -- that is attributed to this water budget
10 analysis doesn't translate. And maybe I answered Mr.
11 Eggen's question not quite correctly. But that certainty in
12 the water budget estimate is not directly -- does not
13 directly translate into uncertainty in the model.

14 Uncertainty in the model -- I'm talking about the numerical
15 model -- has to do with uncertainty in the specific inputs
16 to that model.

17 Q And the water budget is an input, isn't it?

18 A It is not.

19 Q Oh, the 60 gallons per minute from the mining inflow is the
20 parameter that we're worried about. Is that what you're
21 saying?

22 A That specific parameter, the model inflow due the mine, is
23 an input to the model. But this overall water budget that
24 goes through the inflows from upgradient and downgradient to
25 this particular small watershed that I described yesterday,

1 those components to the water budget are not inputs to the
2 model -- direct inputs to the model.

3 Q I see. If we go to the next paragraph, that paragraph
4 starts out by saying that, "The latest estimate of flow to
5 the mine as predicted by Wozniewicz at Golder is the base
6 case of 60 gallons per minute"; right?

7 A Yes.

8 Q And that's the input that you were talking about that is
9 relevant for your model; correct?

10 A That is a relevant input.

11 Q Okay. And were you here during Mr. Zawadzki's testimony?

12 A I was not.

13 Q You were not. You've reviewed the Golder modeling, haven't
14 you?

15 A I have.

16 Q And you used the modeling as part of the modeling for
17 your -- part of the inputs for your model; correct?

18 A That's correct.

19 Q You identify here on page 4 the base case prediction of
20 inflow into the mine of 60 gallons per minute. And by base
21 case, that's the -- can we call that in laymen's terms a
22 typical case?

23 A I would say most expected case or expected case.

24 Q Most expected. Okay.

25 A Let's just say expected case.

1 Q All right. And you understand that, in Golder's sensitivity
2 analysis, for their modeling -- the inflow into the mine,
3 one of the items that they considered was extending the
4 conductive features to the top of the bedrock?

5 A Yes.

6 Q Are you aware of that?

7 A Was that in their memo?

8 Q Well, it was in the testimony two days ago.

9 A Yes, I heard about that.

10 Q Okay.

11 A Yes.

12 Q As we all did. And do you understand that, by extending the
13 conductive features; that is, the faults and fractures and
14 so on; to the top of the bedrock, they would increase the
15 inflow -- the predicted inflow to the mine by give or take
16 25 percent?

17 A That's -- I heard the same thing. I didn't review that
18 piece. And I think they might have testified also about why
19 they didn't do that in their base model.

20 Q I understand. But with a model, we're dealing not with a
21 particular fixed number if it's an output. We're giving it
22 a range of figures, aren't we, or a range of results
23 typically with a model?

24 A Yes; yes.

25 Q You have a lower bound and then an upper bound?

1 A You can present it that way, yes.

2 Q Okay. In fact, in our testimony yesterday, you suggested
3 that there are ranges to the amount of drawdown in the
4 aquifer based upon the model results; correct?

5 A Yes; yes.

6 Q So if we increase the predicted mine flow by 25 percent as
7 Golder did in one of their sensitivity analyses, then that
8 would correspondingly increase the amount of drawdown of the
9 aquifer; correct?

10 A Yes. I don't know if it would be exactly 25 percent, but it
11 would be an increase.

12 Q You actually anticipated the next question. Would that be a
13 linear function or it would be a non-linear function?

14 A Typically non.

15 Q Non-linear. But you'd have to estimate a different range of
16 drawdowns if you increased the significant parameter of mine
17 inflow by 25 percent?

18 A Yes. If we were to look at that scenario, it would be --

19 Q Right.

20 A You would have to run the model again.

21 Q And for purposes of predicted analysis here so that the
22 folks at Kennecott can figure out whether or not they have
23 to change their application or whether the DEQ should review
24 the application in some different light, it would be
25 important to know those different ranges; wouldn't you

1 agree?

2 A I think that -- I think I presented yesterday some
3 reasonable ranges based on the most likely or I guess I said
4 estimated mine inflow. And I think that those ranges are
5 the kind of ranges that should be considered.

6 Q All right. From a modeling perspective; right?

7 A Yes.

8 Q But don't you think it would be important for the applicant
9 and for the regulatory agency to understand the range of
10 possibilities here for purposes of deciding whether this
11 mine is going to pollute, impair, destroy the environment?

12 A Yes.

13 Q That's an important consideration, don't you think?

14 A Yes.

15 Q Okay. Golder in its sensitivity analysis also suggested
16 another change which would be to lower the contact between
17 the upper bedrock and the lower bedrock from 90 meters of
18 TVD -- TVD is what?

19 A Total vertical depth.

20 Q Total vertical depth, right. From 90 --

21 A I'm sorry. True vertical depth, I believe, is correct.

22 Q 90 meters true vertical depth, that is depth from the
23 surface; right?

24 A Yes.

25 Q To 120 meters TVD. You're aware of that?

1 MR. LEWIS: Object to the form of the question,
2 your Honor. It mischaracterizes the testimony. This was
3 not a suggestion by Golder. It was the terminology used by
4 counsel.

5 MR. HAYNES: All right. Fine. I'll rephrase.

6 A I'm aware that they ran a sensitivity analysis.

7 Q They ran a sensitivity analysis basing the new analysis on
8 lowering the contact from 90 meters to 120 meters; right?

9 A I don't recall that detail, but generally, yes, they lowered
10 that interface and made a simulation.

11 Q Okay. Well, that's what Mr. Zawadzki testified about two
12 days ago.

13 A Okay.

14 Q And then running that scenario, Golder predicted an increase
15 in the mine flow of about 30 percent or about 80 U.S.
16 gallons per minute. You're aware of that?

17 A Generally, yes.

18 Q Okay. And again like the increase of conductive features to
19 the top of the upper bedrock, that's a factor that probably
20 should be taken into account by the applicant and by the
21 regulators to view those most reasonable possibilities based
22 upon the uncertainties that we have?

23 A Yes. There is a reasonable range. And that's what
24 they're -- I believe Golder was getting at.

25 Q All right. Now, you're also aware that Golder, in its

1 model, predicted an upper bound case of mine inflows at 210
2 U.S. gallons per minute? You're aware of that?

3 A Yes.

4 Q You didn't use that figure in your models, did you?

5 A No.

6 Q And like the factors that Golder used in its sensitivity
7 analysis, for purposes of an upper bound case for the
8 drawdown of the aquifer from the mine inflows, it would be
9 useful at a minimum to run a model using 210 gallons per
10 minute rather than 60; would you agree?

11 A As I said with Mr. Eggan, I didn't look at a worst case
12 scenario. I was looking at a expected case mine inflow and
13 a reasonable range that would be generated from that.

14 Q But like our questions about the sensitivity analysis that
15 Golder ran, increasing certain factors -- parameters to then
16 increase the mine inflow for purposes of the DEQ and for the
17 applicant, it would be important for them to understand the
18 range of outputs from a model using an upper bound case?
19 You would agree with me on that, wouldn't you?

20 A I think so. It might be important for them, yes.

21 Q Okay. And speaking of the worst case scenario, if we could
22 go to page 9 of your technical memorandum? In the summary
23 and conclusions portion, the second paragraph, Mr. Eggan
24 asked you about the sentence that says, "No attempt is made
25 in this analysis to define the most conservative or a worst

1 case scenario." And I'd like to explore a couple of things
2 that perhaps weren't answered when you working with Mr.
3 Eggan. How would you, as a modeler, define "most
4 conservative" so that all of us here at this -- in this side
5 of the room -- this end of the room can understand that,
6 because I don't think all of us are.

7 A Well, there's no clear-cut definition. And there is always
8 a difficulty with defining what is the most conservative.
9 One modeler and another modeler both reasonable might
10 disagree on that.

11 Q I see. So in the modeling community, the question of -- in
12 the abstract of what a most conservative case is really
13 can't -- there's not much agreement on that -- not
14 necessarily an agreement on that; correct?

15 A Reasonable minds tend to disagree on that.

16 Q Okay. And perhaps you answered this with Mr. Eggan. I'm
17 not sure. But is "most conservative" equivalent to "worst
18 case scenario"?

19 A I'd say they're very similar, yes.

20 Q But "worst case" sounds like it's a little more severe than
21 "most conservative."

22 A Okay.

23 Q Is that a fair characterization?

24 A I think that's probably fair.

25 Q Okay. And worst case scenario, is there a definition of

1 that that modelers use for worst case scenario?

2 A I think in the case of a worst case scenario, it's a
3 combination of all the possible and various parameters as I
4 showed yesterday. You can increase a parameter and that
5 increase might change the results, might make a bigger
6 impact, for instance. And you can change another parameter,
7 and that might make a bigger impact. The worst case is when
8 you try to combine those together and how many of those you
9 combine together and to what extent you take that parameter
10 value. That's where there's some debate in terms of what is
11 a worst case.

12 Q So that worst case in once sense might be taking all of the
13 parameters, all the input parameters, and taking the largest
14 or the most severe example of that and putting -- for each
15 of the parameters putting that most severe or worst case
16 parameter into the mine?

17 A That's right.

18 Q And so a worst case model would predict -- correct me if I'm
19 wrong -- but would predict probably a wider range of
20 outputs, wouldn't it?

21 A No. A worst case model would just predict a very high,
22 perhaps unreasonable, impact.

23 Q Okay.

24 A It would be one particular impact, not a range. It would
25 just be like an end number of that range perhaps.

1 Q I see. So one end of it?

2 A Yes.

3 Q All right. Okay. And as far as you know, that worst case
4 scenario has not been modeled here for this project -- for
5 the aquifer drawdown?

6 A I have not attempted to model the worst case aquifer
7 drawdown.

8 Q And you haven't seen anybody else do that, have you?

9 A Fletcher Driscoll modeled an upper bound -- did an upper
10 bound model.

11 Q But upper bound is not the same as worst case, is it?

12 A They're very similar. They're very similar.

13 Q But not equivalent?

14 A Yes.

15 Q Because upper bound uses the high end of the reasonable
16 parameters, doesn't it, rather than the worst case
17 parameters?

18 A That's right. Well, that's the way that Fletcher Driscoll
19 did it. I'm sorry. To finish that answer to that question,
20 I believe that Petitioners' consultants modelers did do some
21 worst case type modeling for drawdown.

22 Q I see. Which in your view reasonable minds can agree -- can
23 disagree about what a worst case is, but certainly doing a
24 worst case scenario is not something that's out of the pale
25 of modeling; right?

1 A No. It's not unusual for someone to attempt to do a worst
2 case.

3 Q Okay.

4 MR. HAYNES: If we could go -- we're going to have
5 to switch projectors now. I apologize. If we could go to
6 the other projector, please. And then go to Kennecott
7 Exhibit 645 when we get the projector up and running.

8 Q All right. Mr. Council, we have the slides on the screen
9 that you testified with yesterday. If we could go, please,
10 to slide 3. Mr. Council, the first bullet on slide 3 talks
11 about your independent peer review of modeling by the
12 Kennecott consultants and consultants to Petitioners; right?

13 A Yes.

14 Q When you say "peer review," you mean you reviewed it
15 because, as a modeler, you reviewed other modeling results.
16 Is that a fair characterization there? I mean, we haven't
17 had any published reviews that -- in which you were asked as
18 an independent person to review these results; right?
19 You're testifying here on behalf of Kennecott?

20 A I guess the answer to one of your questions is, yes, I'm
21 testifying on behalf of Kennecott. I did do a review -- a
22 peer review. And I was hired by Kennecott to do a peer
23 review of Fletcher Driscoll's models and Golder's mine
24 inflow models.

25 Q You mean, as a separate modeler, you looked -- you didn't

1 talk to Fletcher Driscoll and Golder's modelers in doing
2 your review? Is that what you're saying?

3 A Initially, no.

4 Q But you did later?

5 A I did later.

6 Q And when you say it's independent, you mean independent of
7 those firms, not independent in the sense that you were not
8 paid for your work or that the government paid for your work
9 or that you did it voluntarily; right?

10 A Yes. That's a correct statement.

11 MR. HAYNES: If we could go to slide 9, please,
12 the ninth slide. I don't think it's numbered. It has the
13 three stream, STRM, gauges. There we are.

14 Q Mr. Council, the ninth slide has the three STRM; that is,
15 Salmon Trout River main branch; gauges indicated along with
16 the orebody and Eagle Rock outcrop. The green figure on
17 this slide from the legend anyway denotes the watershed that
18 the STRM011 is contained in; correct?

19 A Yes.

20 Q And so by elimination, STRM002 is not in the same watershed
21 as you've defined it -- correct? -- as STRM011?

22 A The STRM002 watershed would be a larger watershed that's
23 further downstream that encompasses this watershed shown for
24 STRM011.

25 Q Okay. So STRM011 is a subset --

1 A It's a sub watershed.

2 Q A sub watershed. Okay.

3 MR. HAYNES: If we could go to slide 11, please.

4 Q Mr. Council, on slide 11, you have the estimated water
5 budget along with a graphical depiction of the probable
6 effects of the mine inflow; correct?

7 A Possible effects and general directions of how these various
8 water budget components might go with mining.

9 Q I have a question about -- what is the thickness generally
10 of the A to E zones? Is that something that's important for
11 the model or is that not considered in the model?

12 A That is important for the model.

13 Q Okay. And the thickness varies over the area of this model,
14 doesn't it?

15 A Yes.

16 Q Of each of the zones?

17 A Yes.

18 Q And those were input into the model, you said, those varying
19 thicknesses?

20 A Yes; yes. Specifically actually the elevations, but the
21 thicknesses are calculated in the model. The top and bottom
22 elevation of the layers were inputs to the model.

23 Q Okay.

24 MR. HAYNES: If we can turn now to slide 29.

25 Q Are you with me, Mr. Council?

1 A Yes.

2 Q Slide 29 shows the -- as you described them, the layers that
3 you used for your model. And following up on my earlier
4 question, the layers for the modeling have a thickness
5 that's input into the model; correct?

6 A Elevations are input.

7 Q Okay. Elevations. And those are based on the grids that
8 you prepared for the model; correct?

9 A Yes. We put them in on that grid basis. That's correct.

10 Q Okay. So there's no one thickness or one elevation --
11 that's not the right word. Each model grid called a
12 node -- is that the --

13 A Node is fine or cell.

14 Q That's the center of the grid is the node?

15 A Yes, center of the cell.

16 Q I'm sorry?

17 A The grid is the total amount of cells. All the cells
18 together make up a grid. Each cell is a little rectangle
19 block. And then the node would be the point in the middle.

20 Q There's a node -- okay. So each node has a particular
21 elevation attached to these various zones; is that right?

22 A That's right.

23 Q Okay. And if we turn to the next slide, slide 30. This
24 slide, Mr. Council, illustrates -- I think you testified the
25 blue figures here show where there's no lean clay; is that

1 right?

2 A Yes, based on the interpretation of the layers -- layer
3 elevations from the borings.

4 Q All right. And around or near the orebody, there seems to
5 be -- there seem to be two -- one smaller and one larger
6 area of no lean clay; correct?

7 A Yes.

8 Q Which would suggest higher hydraulic conductivity; right?
9 No lean clay?

10 A It means that that particular low conductivity layer is not
11 part of the sequence.

12 Q Okay.

13 MR. HAYNES: If we could go to slide 38.

14 Q Mr. Council, slide 38 talks about impact predictions. And
15 you're simulating again the base case mining flow of 60
16 gallons per minute; correct?

17 A Yes.

18 Q And simulating an infiltration from the TWIS of 65 gallons a
19 minute; right?

20 A Yes.

21 Q And your model deals with the impact at STRM002 for the
22 stream -- the change in stream level; correct?

23 A That is one of the impact outputs, yes.

24 Q All right. And what's one of the impact outputs -- maybe I
25 missed this yesterday. But was one of the impact outputs

1 the effect at STRM011?

2 A Yes.

3 Q And did you have -- did you model at all the impact to the
4 stream between the TWIS and STRM011 or just at STRM011?

5 A The stream doesn't go between the TWIS and STRM011. I
6 modeled the entire -- the impact of the stream at many
7 points along the length of the stream.

8 Q All right. Let's go to slide 39, which is the next one.
9 This slide, Mr. Council, deals with the proposed head change
10 in layer one, which is the upper layer; correct? Layer one?

11 A Yes. It's not proposed head change but it's predicted.

12 Q Sorry. I misspoke. The predicted head change.

13 A Layer one is right.

14 Q And is there a reason you didn't extend the predicted head
15 change -- let me back up. We have a 0 figure here. You
16 know, on my slide, I have a line that sort of squiggles
17 almost due south from there. Do you recall that on your --

18 A It's actually there, but it's hard to see.

19 Q Oh, it is faint. There it is. Okay. Maybe I have to move
20 closer. And your contour lines here are -- they go from 0.5
21 to 1 to 2; right?

22 A Right.

23 Q You don't have any outputs for something less than --
24 something between 0 and 0.5 or you just didn't show them on
25 this?

1 A I just didn't contour that particular -- any levels between
2 0 and 0.5.

3 Q Okay. But we can assume between the 0 line going due south
4 from the -- it appears from Eagle Rock -- from that 0 line
5 to the 0.5 line in the red, which is the drawdown, that
6 there is some drawdown between 0 and 0.5; correct?

7 A Yes.

8 Q All right. And that would be true -- would that also be
9 true if we look at the orebody? If you were to draw those
10 contours at something less than 0.5, you could -- we could
11 figure out those contours south of the orebody?

12 A South of the orebody?

13 Q Yes.

14 A Yeah. The drawdown there is substantially -- it is between
15 0 and 0.5. It is small in the model.

16 Q And this again is based upon 60 gallons per minute into the
17 mine; correct?

18 A Yes.

19 Q So if you varied your model to say Golder's scenario that
20 215 gallons per minute, then the outputs here would be
21 different; correct?

22 A I don't think there's -- I don't know of a 215 gallon per
23 minute scenario is currently -- maybe that's the 2006.
24 Maybe you're thinking about the 2006 model. But the 2008
25 model is slightly lower. It's 210.

1 Q I'm sorry. 210, right. I misspoke.

2 A The drawdown would be larger at 210.

3 Q If we used the Golder upper bound case of 210, then the

4 outputs here would be different and probably larger;

5 correct?

6 A Correct.

7 Q In drawdown?

8 A Correct.

9 Q you haven't been asked to do that to model the upper bound

10 Golder case, have you?

11 A I have not.

12 Q If we could go to slide 59, please. Slide 59, Mr. Council,

13 talks about predicted ranges of stream flow impacts. Do you

14 have that in front of you?

15 A Yes.

16 Q When you say stream flow impacts, by impacts you are talking

17 specifically only about the increase in water flowing into

18 the stream; correct?

19 A Decreases in stream flow -- decreases or increases in stream

20 flow is what we mean by stream flow impacts.

21 Q Right. And by "impacts," you don't mean anything larger

22 like impacts to flora and fauna, aquatic resources, things

23 like that; right?

24 A No. Those types of impacts may depend on the stream flow.

25 But I'm not -- this model is not handling any of that.

1 Q Right. I'm just trying to determine the definition of
2 "impact" as used in your testimony. That's fine.

3 A It's stream flow.

4 Q It is quantity of water?

5 A Exactly.

6 Q Mr. Council, Mr. Eggan asked you about various models that
7 were prepared before your April 1, 2008, model. By the way,
8 that is your first model, isn't it, in this exercise we're
9 dealing with today?

10 A For this project, that was the first model.

11 Q Okay. And there were the Fletcher Driscoll models and the
12 Golder model that preceded yours; right?

13 A Yes.

14 Q And do you know whether those models followed the DEQ
15 modeling guidelines?

16 A To some extent, yes.

17 Q To some extent, no?

18 A And originally at least with the Golder -- Golder model by
19 and large I think the answer -- I'd have to break it down
20 into each model and go into the specifics. And then I have
21 to think about what's in the DEQ standards versus what's in
22 the ASTM standards. I can say, though, that, to try to
23 generally answer your question, Fletcher Driscoll, there
24 were some shortcomings where they didn't quite, in my
25 opinion, follow all of the standards. And then in Golder,

1 pretty much those models did follow all the standards. I
2 did come back with a comment that there was not originally a
3 predictive sensitivity analysis, which would be required
4 by -- or would be at least suggested by guidance and
5 standards. Subsequent to that, they did, in fact, do that
6 predictive sensitivity analysis. And I believe that Mr.
7 Zawadzki testified about that.

8 Q Right. And that sensitivity analysis is what you and I
9 discussed earlier this morning?

10 A Yes; some of that, yeah.

11 Q All right. That is dealing with the change in the factors
12 going into the -- the fissures going to the top of the
13 bedrock and also lowering the contact zone between upper and
14 lower bedrocks; right?

15 A That was part of it. The elected sensitivities and show
16 that there was says in some reasonable scenarios, the mine
17 inflow increased; some reasonable scenarios, the mine inflow
18 decreased.

19 Q Okay. If we could go to slide 54, please. I apologize, Mr.
20 Council. We're jumping around. But I'm now -- I now have a
21 slightly different series of questions. Slide 54, your
22 prediction sensitivity talks about aquifer drawdowns at the
23 wetland piezometers could be in the range from less than .1
24 feet to greater than 2.5 feet; right?

25 A Right.

1 Q That's a range of about a factor of 25, isn't it?

2 A Well, I don't think it should be stated in terms of a
3 factor. I think it should be -- if it's a range of about
4 2-1/2 or more feet; 0 to 2-1/2 feet.

5 Q Okay. But if we say -- and I'm just looking at the numbers.
6 And if you multiply 0.1 times 25, you get 2.5; right?

7 A Yes.

8 Q So you have a variance of -- maybe that's not the right
9 word -- but a variance of a factor of really 25? You can --
10 I mean, that's the range; right?

11 A Yeah. I guess I wouldn't state it in terms of a factor in
12 this particular case. But your statement is correct.

13 Q And then you testified also that the drawdown, in your view
14 based upon the single mine input -- or mine inflow of 60
15 gallons per minute -- the drawdown for the wetlands would be
16 from 6 inches to a few feet; right?

17 A From very near 0 to a few feet.

18 Q Okay. "A few feet" meaning what? 2, 8, 6?

19 A 2 or 3.

20 Q 2 to 3. Okay. So that's a range of, say -- again I'm going
21 to use the word "factor," because I'm not sure of another
22 one I could use. But the range there is a factor of, say, 5
23 to 6 from the lower case to the upper case if it's near 6
24 inches to, say, 2 or 3 feet?

25 A Some of the runs are less than 6 inches, are down very near

1 0. So the factor might be quite large. But that doesn't
2 reflect a large uncertainty. That just reflects that some
3 of the runs have a very, very low predicted drawdown.

4 Q And that's based upon the single mine inflow input or
5 parameter of 60 gallons per minute; right?

6 A That's right.

7 Q So if you increase that parameter to the upper bound case of
8 the Golder model of 210 gallons per minute, you'd have a --
9 not necessarily a linear increase in that drawdown but some
10 larger increase -- right? -- that you haven't modeled?

11 A Yeah. I would expect that the range would increase a bit.

12 MR. HAYNES: Thank you, sir. I have no further
13 questions.

14 MR. WALLACE: I have a few questions.

15 CROSS-EXAMINATION

16 BY MR. WALLACE:

17 Q I guess I'm trying to relate this modeling to this case in
18 my own mind. And I may ask some questions that reflect
19 abysmal ignorance, because I didn't understand a lot of what
20 you testified to yesterday. So just bear with me. But let
21 me ask, for example, does any of the models -- do any of the
22 models consider the possibility of a catastrophe to the
23 crown pillar of this mine like a plug failure or a collapse
24 of the mine of some sort that would create an immediate
25 enormous drawdown?

1 A None of the models have that hypothetical potentiality in
2 it.

3 Q Have you seen any materials in preparing for your testimony
4 provided to you by Respondents or in your own research where
5 anybody has looked at what will happen to these wetlands if
6 there's a catastrophic event of some sort?

7 A No.

8 Q And by "catastrophic event," I'm not limiting it to a crown
9 pillar collapse but let's say the wastewater treatment plant
10 ceases to function for a week or two or there's a 100-year
11 storm or, you know, far greater precipitation over the
12 course of a period of time than is expected. You know, is
13 that somehow put into your model or these other models, the
14 aberrant situation?

15 A Generally, no.

16 Q So you take -- you start with a single figure, 60 gallons
17 per minute, as your assumption for mine inflow, and you just
18 go with that under a bunch of different scenarios. But
19 that's always your assumption -- is that right? -- on your
20 modeling?

21 A Yes.

22 Q We had testimony a few weeks ago -- or was it months ago? --
23 it's hard to tell now from a gentleman whose name was Trevor
24 Carter. And he did a paper about hydraulic permeability.
25 Did you read that paper?

1 A I read it, yes. The permeability changes.

2 Q Mine induced permeability changes.

3 A Permeability changes, yes.

4 Q And his theory was the stresses will be changed and the
5 crown pillar will be clamped so it will be less permeable.

6 A I read that.

7 Q Okay. So did that theory make it into any of these models?

8 A No. We didn't -- that might actually make the mine inflow
9 lower.

10 Q That would be the idea of it. But nobody modeled that
11 either?

12 A No. That wasn't taken into account.

13 Q You know, in some of your slides, you talked about the
14 drawdown under some set of inputs of several feet. I think
15 that you used the term "several feet."

16 A Yes.

17 Q Do you recall that?

18 A Yes.

19 Q Okay. Would the drawdown of several feet -- you also
20 calculated or does the model tell us for how long the
21 drawdown will be several feet?

22 A The model does not talk about the length of time that this
23 impact would occur.

24 Q And I know you were very clear especially at the end of your
25 testimony that modeling is a simplification, and you have

1 admitted that there's some art to it. So when you say --
2 use the word "several," which is very imprecise, do you have
3 in mind a range for "several" or is it just safer to say
4 "several"?

5 A I would say 0 to 2 to 3 feet, as I mentioned earlier with
6 Mr. Haynes.

7 Q And sitting here, I don't know if the whole concept is too
8 complex. But if you simply took the one what seems to be
9 critical input, the gallons per minute inflow, and moved
10 from the 60 to the 210 that's been used, can you tell us
11 what that does to -- in general, to several feet?

12 A No. In general, as I said, the drawdown under that case
13 would go up. I think the 60 gallon per minute is a
14 reasonable -- in fact, more reasonable case than the 210.

15 Q Okay. On the 60 gallon per minute, the reason why you would
16 use a number like that is this is day-to-day, everything
17 going fine, the way we sort of think and hope this mine will
18 operate, 60 gallons per minute; right?

19 A It's the way you think it will operate, and also we should
20 keep in mind that there are inflow controls that the company
21 could or would implement as necessary.

22 Q But not controls that would deal with the kinds of
23 catastrophes that we're talking about? I mean, if the mine
24 collapses, the grouting doesn't --

25 A Not that one. I don't think that -- well, actually they

1 have engineering controls for that sort of thing. But
2 they're not the kind of controls we were talking about.
3 They're not grouting. Others would have to speak to this.
4 But it deals with rock bolting and those various techniques
5 that could be employed to avoid such things.

6 Q You wrote a paper about -- I think it may had in the title a
7 bag of tricks for managing the MODFLOW model or something
8 like that. Is that close to the title of your paper?

9 A "A Bag of Tricks for Working with MODFLOW" or something like
10 that.

11 Q Yeah.

12 A I should have probably called it "techniques" in retrospect.

13 Q If you had, I wouldn't have even had the question. Okay.
14 And is that paper a reflection of kind of the art? You look
15 at MODFLOW and you've got -- you've worked with it for
16 awhile. And you have your own angles on making it work
17 better? Is that --

18 A I don't know if that gets into the art of modeling really.
19 It was really more about the technical details of modeling
20 and how to do -- some techniques you could use as a modeler.
21 I was giving this out to an audience of other modelers
22 really. That was the intention of it. There are some
23 techniques you can use that I've learned over the years of
24 modeling that are helpful in producing the kinds of outputs
25 or dealing with the kinds of models that we need -- the

1 kinds of models we often have to do.

2 Q Let me go one more area of -- on the input subject. Is
3 there any aspect of the input to your model that considers
4 the effects of blasting the bedrock?

5 A Yes. The 60 gallon per minute mine inflow input comes from
6 the Golder base case model, which reflects stress-induced
7 permeability changes, maybe not specifically blasting, but
8 it has that -- the idea of that in there.

9 Q You know, that's a figure that has some stress calculation
10 behind it, some assumptions?

11 A Yes.

12 Q But I'm talking about vibration from blasting. Do you see
13 that taken into consideration in any model, fracturing, the
14 various kinds of --

15 A Yeah. I think that that stress-induced permeability changes
16 deals with that specific issue.

17 Q Well, do you really think that stress and fissures, for
18 example, in the bedrock are the same thing?

19 A We may be straying out of my area of expertise a bit. But
20 my understanding is that generally, yes, the stresses would
21 be caused by the activities that are done underground
22 including blasting and opening up stopes and that the
23 stresses would potentially increase permeability in an area
24 around the mine. And that eventuality is, in fact,
25 accounted for in the work that Golder did.

1 Q Okay. You're talking about the stress induced by blasting.
2 I'm talking about the effects of vibration from that
3 blasting, that stress on the surface, on the water, on the
4 bed of the stream, on the bedrock. Do you see any inputs
5 that you could point us to that deal with the vibrations
6 caused by blasting?

7 A The only potentially relevant input is that -- is the
8 inflow -- what was taken into account in the inflow modeling
9 done by Golder.

10 Q If it's in the 60 gallons, then, yes. If it's not, then,
11 no?

12 A If it's not, then, no.

13 Q Okay. Did your slide -- I don't think we need to go to it.
14 But it was slide 30. And it showed the gray area where the
15 confining area was absent.

16 A I remember that one.

17 Q Okay. Is that area -- we can agree -- and a confining layer
18 is the clay; right?

19 A Yes. It's the lean clay, that C zone.

20 Q C zone. And this clay is the least permeable of the layers;
21 right?

22 A Yes.

23 Q Okay. And so the effect of clay in this quaternary system
24 is that it can be -- I think they used the term be an
25 aquaclude; right?

1 A Yes.

2 Q It blocks water from flowing from one layer to the other
3 where it exists; is that right?

4 A In a sense, yes.

5 Q Okay. And where the clay is absent, then water flows easily
6 between layers?

7 A Not necessarily. There are other layers, the B zone, in
8 particular. We have quite a bit of silty zone, silty clay,
9 in the area near the orebody that will also limit the
10 communication between the upper part of the aquifer and the
11 lower part of the -- sort of the A-B zone versus the C-D
12 zone.

13 Q Okay. Fair enough. But the significance of an absence of
14 this C layer is that there's the greater potential for water
15 to -- for drawdown between the two layers frankly; right?

16 A Where the C layer is present and thick, it's pretty certain
17 that the -- it's more likely that you're not going to have
18 good communication between those two layers.

19 Q Okay. Which means drawdown occurs more easily?

20 A Well, it means that, if we have drawdown -- if we have a
21 case where the C layer is very thick -- it's present and
22 it's very thick and we have drawdown in the D-E aquifer --
23 the D zone really, it doesn't -- it means there will be
24 probably little or no drawdown above that C zone.

25 Q And I'm referring to your Exhibit 30 where there's a large

1 area of no clay at all; correct?

2 A There are areas of no C zone interpreted.

3 Q Okay. And those areas are, among other things, right above
4 the orebody where the mining is taking place; correct?

5 A Yeah. Over part of the orebody, yes.

6 Q You testified yesterday to something that's pretty obvious,
7 which is there would be more runoff from this site once it's
8 developed; right?

9 A Yes.

10 Q Okay. Is that quantified somehow, the increased runoff that
11 will result just from building the buildings and laying down
12 whatever we do on -- whatever you do on the surface and so
13 forth; is that quantified?

14 A I didn't do an analysis of that.

15 Q Have you seen any quantification of the increased runoff
16 from this site once it's developed?

17 A I haven't seen an analysis of that. I used an estimate of
18 five gpm consistent with some estimates that have been made
19 by other modelers. But no analysis; I haven't seen an
20 analysis.

21 Q Were you told what to model for -- I'm still puzzling over
22 the total absence of any models that look at collapse or
23 look at catastrophe and I wonder if you were told what to
24 model. Were you told to use 60 gallons per minute?

25 A No.

1 Q Were you told not to model worst-case scenarios?

2 A Not in those terms; no.

3 Q Were you told in some terms to -- did you make a decision on
4 your own not to produce a model that would show what would
5 happen in a catastrophe if something goes amiss at this
6 mine?

7 A I didn't consider that part of my work skill at all.

8 Q Okay. But how did you learn what your work skill was if you
9 didn't consider that part of it?

10 A Well, just -- I guess maybe it'll help to describe, you
11 know, sort of how my work skill developed. I was brought in
12 as a -- to peer review two modeling analyses when -- two
13 modeling analyses: one done by Dr. Driscoll and one done by
14 Golder, and --

15 Q And you found areas to criticize in those models?

16 A That's fair. Not so much in the Golder; a minor point that
17 was corrected, but in the Fletcher Driscoll I found an
18 error, plus at that time, as I think I said yesterday, they
19 were updating the mine plan for the lower level of mining,
20 the thicker crown pillar at that time. They had included --
21 Golder had included in a simulation the effects of stress-
22 induced permeability changes. And I think the Kennecott
23 Company decided that it would be a good idea to try to
24 figure out what that would mean and that's really what they
25 asked me to look at.

1 Q Were you ever party to any discussions about worst-case
2 scenario modeling? Did this ever come up?

3 A We discussed whether we should -- whether we should run a
4 worst-case scenario model or whether we should focus on the
5 reasonable case and we came to the conclusion that it made
6 sense to focus on the reasonable case.

7 Q Where everything's going pretty much according to plan; is
8 that a way of putting it, "reasonable"?

9 A Well, there's some conservatism built in that -- sort of
10 that best-estimate case that we talked about and it's -- and
11 to some extent the mine inflow is controllable, so it's
12 plannable. But we didn't go -- as I said, we just didn't go
13 into the worst-case modeling.

14 Q Okay. Your last slide -- it looks it might be touching on
15 worst-case scenario a little bit. If mine inflow is large
16 you draw down a protection criteria and what do you mean by
17 "protection criteria"?

18 A Well, criteria that are set in order to protect the
19 resources such as the wetlands.

20 Q And where did you come up with this list?

21 A This is just a formation of my opinions on how models should
22 be used. It's just a -- seems to me to be a reasonable
23 management strategy.

24 Q Do you have a management strategy for a collapse of the mine
25 where enormous volumes of water are swept down into the mine

1 and the wetlands are drawn down for, you know, a
2 considerable area and length of the river?

3 A No.

4 Q There isn't one, is there? There's nothing much you can do
5 about that from a management standpoint?

6 A Yeah, you try to avoid -- you know, it's important to avoid
7 that sort of thing.

8 MR. WALLACE: Thank you. I have nothing further.

9 MR. HAYNES: Your Honor, I apologize. Can I have
10 one very pointed -- not pointed, but one very brief question
11 before we get to redirect?

12 JUDGE PATTERSON: But only one. You know I count.

13 MR. HAYNES: Just one.

14 RE-CROSS-EXAMINATION

15 BY MR. HAYNES:

16 Q Mr. Council, on slide 34 you have in the first line here
17 something called "Maximum Recharge Rate (inches per year)."
18 Do you see that?

19 A Yes.

20 Q Is the term "maximum recharge rate" equivalent to a value of
21 effected porosity of the soil?

22 A No.

23 Q "No"? Would it relate to it at all?

24 A No.

25 MR. HAYNES: Thank you. Sorry. One and a half.

1 JUDGE PATTERSON: Close enough.

2 REDIRECT EXAMINATION

3 BY MR. LEWIS:

4 Q Mr. Council, just to be clear, the -- as to the questions
5 about the C zone and the figure, I believe, where you had
6 indicated where the C zone was inferred to be absent or
7 nearly so, you took those varying areas and extended the C
8 zone into account in your modeling?

9 A Yes. That map is in the model exactly as it's shown.

10 MR. LEWIS: That's all I have.

11 MR. REICHEL: I have no questions, sir.

12 JUDGE PATTERSON: Thank you.

13 (Witness excused)

14 MR. LEWIS: We're going to make a line change
15 next, your Honor. I think Mr. Predko's coming in with
16 another witness.

17 JUDGE PATTERSON: Oh. I didn't see anybody back
18 there.

19 MR. LEWIS: Well, he's probably here, but --

20 JUDGE PATTERSON: I thought maybe we were done for
21 the day.

22 (Off the record)

23 REPORTER: Sir, would you raise your right hand?
24 Do you solemnly swear or affirm the testimony you're about
25 to give will be the whole truth?

1 MR. KAILING: I do.

2 PETER J. KAILING

3 having been called by the Intervenor, testified as follows:

4 DIRECT EXAMINATION

5 BY MR. PREDKO:

6 Q Could you state your full name for the record and spell your
7 last name, please?

8 A My name is Peter J. Kailing, K-a-i-l-i-n-g.

9 MR. PREDKO: And I apologize. I have a few
10 demonstratives which I don't think are going to be
11 objectionable. They purely demonstratives and there are, I
12 believe, a total of five slides.

13 Q Mr. Kailing, what do you do for a living?

14 A I'm a -- work in the consulting world as a wildlife
15 biologist and project manager.

16 Q And where are you currently employed?

17 A I'm currently employed at the Fishbeck Thompson Carr and
18 Huber, Incorporated in Grand Rapids, Michigan.

19 Q All right. I'd like to talk a little bit about your
20 qualifications starting with your formal education. What
21 kind of formal degrees do you have?

22 A I have a bachelor's in wildlife and fisheries biology from
23 Michigan State University and a master's in science in
24 outdoor feature education from Northern Illinois University.

25 Q And when did you receive your Bachelor of Science from

1 Michigan State?

2 A 1983.

3 Q And your master's?

4 A '94.

5 Q Okay. Do you have any specialized post-degree training?

6 A I have been to several courses in wetland delineation

7 sponsored by the Michigan DNR, Army Corp of Engineers as --

8 associated with my work when I worked for the DNR. And I

9 have soil erosion and stormwater operator permits from the

10 State of Michigan.

11 Q How about any wildlife related post-degree training?

12 A Well, I have experience with -- I took a short course in

13 tracking rare mammals in 2006.

14 Q Do you have any special training in vegetative

15 classification?

16 A And I -- yes, I took a class with Professor Kotar from

17 Minnesota. It was a DNR sponsored course on evaluating

18 timber stands and their potential presence on sites based on

19 classification of herbaceous vegetation.

20 Q And who is Professor Kotar?

21 A He's a noted forest ecologist who has developed a

22 classification scheme to identify forest types and it's been

23 adapted by the Minnesota DNR and other Great Lakes states as

24 a newer method to do forest management.

25 Q Now, have you given any presentations or acted as an

1 instructor?

2 A I have taught at Ferris State University doing a biology lab
3 for non-biology majors. And I've done some presentations on
4 tracking for wildlife. I did that as a volunteer basis for
5 outdoor ed project at Ferris State. And I've taught
6 tracking humans for Central Michigan Search and Rescue
7 organization which I belong to. I've done it in informal
8 situations with scout groups and we volunteer in the area
9 where I live.

10 Q Next I'd like to talk about your job experience and
11 specifically job experience that may be related in some way
12 to the work that you've done on this project.

13 A Prior to joining Fishbeck I worked at King MacGregor
14 Environmental for about seven years where I conducted many
15 studies for rare, endangered species, studies for wetland
16 presence, studies that -- in delineation, upland habitat
17 assessments for both wildlife and vegetation.

18 Q And how many years did you work for King and MacGregor?

19 A Seven years.

20 Q Okay. Any job experience prior to that that's related to
21 the wildlife area?

22 A Yes. Previous work experience included six summers working
23 for DNR fisheries division doing stream and riparian
24 restoration work. Then in other work I begun assessments --
25 similar kinds of terrestrial assessments briefly in Maryland

1 for a year, more informally overseas for three years in
2 Tanzania, East Africa where I lived in a rural area and
3 conducted natural resource management.

4 Q And the -- you said you had some experience working with the
5 MDNR?

6 A That's right. For nearly seven years in the Grand Rapids
7 district office I was a district representative where I had
8 responsibility to process permit applications under the
9 Inland Lakes and Streams Act, Wetlands Act, Great Lakes
10 Shoreline Protection Act. And my responsibilities included
11 reviewing those for completeness, conducting site
12 assessments, looking at the plans that were submitted and
13 making a decision as to whether the projects could be
14 permitted under the criteria of the various statutes.

15 Q How did you become interested in the area of wildlife?

16 A Well, I grew up on a farm in rural Newago County and had
17 early childhood exposure to the natural world and that
18 piqued my curiosity. And I basically followed my interest
19 that way through my developing years into high school and
20 college.

21 Q Now, is working with wildlife just a job for you?

22 A No, it was a recreational pursuit, an avocation pursuit as
23 well. I am a birder on my own time; I enjoy that. I grew
24 up hunting, fishing, trapping, ginseng digging and those
25 kinds of crafts more popular in the 19th century my father

1 and uncles had an interest in, so I followed their lead and
2 then that led into my career work in college studying the
3 same areas.

4 Q And you said you now work in the Grand Rapids area?

5 A That's right.

6 Q Did you have any personal connections to the Upper
7 Peninsula?

8 A Yes. My mother is from Rapid River, which is a small town
9 in the UP, so I have a plethora of cousins, aunts and uncles
10 that live in the region and visited there frequently in my
11 youth and even today.

12 MR. PREDKO: And for the record, Mr. Kailing's CV
13 has been stipulated to and already admitted as Intervenor
14 146.

15 Q Now, in connection with your work on the Kennecott project,
16 Mr. Kailing, I understand you've reviewed many materials?

17 A I have.

18 Q Okay. Have you reviewed the mine permit application in this
19 matter?

20 A Yes, I have.

21 Q And have you reviewed the Environmental Impact Assessment
22 for the mine?

23 A I have with an emphasis on those areas that I'm familiar
24 with: wildlife and the ecological impacts.

25 Q And would that include the appendices that -- and reports

1 that are attached to the Environmental Impact Assessment?

2 A Yes.

3 Q Have you reviewed the relevant portions of the mine permit

4 itself?

5 A Yes, I have.

6 Q And what was your focus when you reviewed the mine permit?

7 A I was looking in the areas that are relevant to ecological

8 impacts: birds, small mammals, frogs and toads; wildlife

9 basically.

10 Q Now, in connection with your work in this case, did you rely

11 on the Environmental Impact Assessment and the attached

12 reports to form the conclusions that you have come to

13 related to the Kennecott mine?

14 A Yes, I did review those and consider those.

15 Q Did you rely on the reports?

16 A Yes.

17 Q Now, in general what kinds of things have you done to come

18 to your conclusions for this matter?

19 A Well, I've reviewed the existing published data, both that

20 which was submitted with the application and more general

21 materials regarding the region. And then I also relied

22 heavily on studies that I was involved with related to the

23 site.

24 Q And you yourself, did you actually conduct site-specific

25 studies?

1 A I did.

2 Q Now, we're going to get into the bases for your conclusions
3 shortly, but to give the court a roadmap of where we're
4 going here I'd like to talk about the conclusions that you
5 have come to. Have you prepared a slide or slides of your
6 conclusions in this case?

7 A Yes, I have.

8 MR. WALLACE: Excuse me. Before we do that, I
9 guess these conclusions imply expertise and qualification as
10 an expert and just based on the foundation laid so far I
11 don't think that this gentleman qualifies, with all due
12 respect, as an expert in these areas. He has some
13 experience, but he has an undergraduate degree; there's no
14 indication he's ever done particular research or writing or
15 scholarly work in these areas. And I think that he can
16 testify as to what he did in this case, but in terms of
17 getting -- giving scientific conclusions, that's really not
18 to be found in his background and I would object to that.

19 MR. PREDKO: Well, Mr. Wallace is free to voir
20 dire the witness, but Mr. Kailing has stated that he's got
21 multiple years, seven years of experience doing this type of
22 work, doing surveys of wildlife. And I can do a little bit
23 more foundation if you wish, your Honor.

24 JUDGE PATTERSON: Okay. If you want to do that.

25 MR. PREDKO: Yeah.

1 Q How many years of experience do you have doing wildlife
2 surveys?

3 A Approximately 15 years.

4 Q Okay. In connection with doing those surveys, do you also
5 have experience evaluating the impacts of human disturbances
6 on wildlife and the environment?

7 A Yes.

8 Q And do you have the same amount of job experience as you do
9 doing surveys?

10 A Yes, I do.

11 MR. PREDKO: Your Honor, he's testified that he's
12 got 15 years of experience doing surveys and evaluating the
13 impacts of human disturbances on the environment. I believe
14 he's qualified to give the opinions in this case, both as to
15 the surveys that he's done and to the potential impacts of
16 the mine on the environment.

17 MR. WALLACE: May I have voir dire?

18 JUDGE PATTERSON: Sure.

19 VOIR DIRE EXAMINATION

20 BY MR. WALLACE:

21 Q Sir, have you ever done an impact assessment or statement
22 for a mining operation?

23 A Yes, I have.

24 Q Okay. When and where was that?

25 A For Cleveland Cliffs in Marquette County as an evaluation of

1 a proposed open pit expansion. I was involved with
2 conducting raptor surveys and we had to make an assessment
3 as to whether proposed activities would disturb known
4 nesting locations of raptorial birds.

5 Q Okay. So you looked at a potential open pit mining
6 expansion and studied the raptors there?

7 A And other songbirds.

8 Q Any other experience with mines, mining impact -- wildlife
9 impact from mining?

10 A I've conducted similar studies for pipelines in utility
11 corridors.

12 Q I'm just talking about mines right now.

13 A Well, frequently one of the components of a mine is getting
14 a utility corridor to it to import the energy in order to
15 export products.

16 Q Well, that's true, but let's just talk about mines: sulfide
17 mines, sulfide mining operations, underground mines,
18 underground mines in the Upper Peninsula. Any of those part
19 of your experience yet, sir?

20 A I've not worked on a sulfide mine before, but regarding the
21 proposed mine you just mentioned, I mentioned the Cliffs
22 Mine. I've done other studies related to iron ore
23 extraction.

24 Q Okay. And where and when?

25 A It typically would be in Marquette County again, '05, '06.

1 A year or two earlier than that again avian studies looking
2 at eagle nests.

3 Q In connection with mining operations?

4 A Yes.

5 Q Okay. Where was that?

6 A That was near the Republic Mine.

7 Q Have you ever been qualified in a court to give an opinion
8 as to the prospective impact of a mining operation or a
9 major industrial operation on the surrounding wildlife,
10 natural resources?

11 A As a witness for the State of Michigan I have given
12 testimony to large-scale industrial projects.

13 Q But that was wetlands testimony, wasn't it, sir?

14 A And the wildlife associated with the wetlands.

15 Q Have you done any research or writing in the area of impact
16 of mines on wildlife?

17 A In a general fashion I did as a graduate student at Illinois
18 University. My assistantship included review of uses of
19 public lands in the East and West United States and part of
20 that assessment included industrial activities on forest
21 lands, public lands, such as mining.

22 Q Did that result in a published paper?

23 A Not to my knowledge.

24 Q Have you -- do you have any published papers?

25 A I do have -- I guess you'd consider them Gray publications,

1 gray journal publications.

2 Q I'm sorry. What's the term?

3 A Gray; the gray journal as opposed to white paper or a
4 popular press. And that was a study and analysis of a
5 sediment removal device. It was associated with riparian
6 restoration and stream restoration.

7 Q Any peer reviewed works?

8 A No.

9 MR. WALLACE: Your Honor, I just -- maybe I need
10 to ask more questions, but I just don't think this quite
11 gets there. I mean, he's done a raptor survey for expansion
12 of a open pit mine. He's studied pipelines. He looked at
13 some related subject area as a grad student back in 1994.
14 He hasn't done any research, he has no publications. I
15 don't really think this gentleman is an expert qualified to
16 testify to the very complex area of what impact human
17 disturbance will have on particular species in a particular
18 location, which is the subject here.

19 MR. PREDKO: Your Honor, I would first remind the
20 court that none of petitioner's wildlife experts have any
21 specific experience in the impacts of mines on wildlife, and
22 so that type of questioning, although Mr. Kailing I believe
23 has more experience than petitioner's experts, it's not
24 necessarily relevant here. What is relevant here is general
25 knowledge and experience of the effects of human disturbance

1 on wildlife. And Mr. Kailing has education and 15 years of
2 experience doing exactly that type of work and eminently
3 qualified to testify on the impacts, ecological impacts of
4 human disturbance -- for instance, a mine or industrial
5 site -- on wildlife.

6 JUDGE PATTERSON: I think there's been a proper
7 qualification under MCR 702 relative to training, education
8 and experience. Obviously, if there are any limitations in
9 that experience relative to mining or sulfide mining that
10 may go to the weight of his testimony, but I think he's
11 fulfilled the requirements of 702.

12 MR. PREDKO: Thank you.

13 DIRECT EXAMINATION

14 BY MR. PREDKO (continued):

15 Q Now, to focus your testimony a little bit here, Mr.
16 Kailing -- now, you don't claim to be a toxicologist?

17 A No, I'm not.

18 Q Okay. And so the opinions that you are giving here today do
19 not relate in any way to the chemicals or particulates that
20 may or may not be emitted from the mine?

21 A That's correct.

22 Q Okay. Can you tell me just a little bit about human
23 disturbance and affects on wildlife and why or why not it
24 may be important to have specific experience relating to
25 mines, or are there general themes in wildlife ecology that

1 apply to all human disturbances? Do you understand my
2 question?

3 A I'll take a stab at it.

4 Q Is it important -- do you believe it's important to have
5 specific experience related to sulfide mines when evaluating
6 the effects of this mine on the wildlife in the area?

7 A No. We can lump disturbances from humans to wildlife in
8 broad categories, such as physical disturbance caused by
9 earthmoving equipment, the presence of loud noise either
10 from vehicles or generators, that sort of thing. Night
11 lighting is a kind of an issue with wildlife and impacts on
12 it from humans; artificial night lighting that might affect
13 wildlife populations. So those kind of disturbances,
14 whether it's to build a mall or to build a sulfide mine or
15 to build a new highway, they're basically the same effects.

16 Q Now, over the last 15 years in your job experience have you
17 studied those types of affects on wildlife?

18 A I have.

19 Q Now, getting back to the Kennecott mine. Have you formed
20 conclusions in this matter?

21 A Yes, I have.

22 Q Okay. And have you prepared a couple of demonstrative
23 slides to illustrate those?

24 A Yes.

25 Q Okay. And you said you conducted surveys with respect to

1 the Kennecott site. What conclusions do you have about
2 those surveys?

3 A Well, they are shown on the PowerPoint slide headed "Survey
4 Results." And the first conclusion is that based on three
5 years of surveys within the study area of approximately
6 1,360 acres the wildlife species identified were common and
7 typical of those species expected to be found in the
8 habitats within the study area. The second conclusion
9 includes that the only threatened and endangered species
10 identified in the study area were the bald eagle, merlin,
11 osprey and gray wolf all of which are classified as
12 threatened; however, the study area does not contain
13 critical habitat for any of those four species. And all
14 evidence from the surveys we conducted indicated that these
15 four species were merely transients within the study area.

16 Q As opposed to residents of the study area?

17 A Yes.

18 Q Now, have you formed conclusions about the impacts of the
19 mine?

20 MR. WALLACE: I'm sorry. I was waiting; I didn't
21 want to interrupt again. I don't think there was a proper
22 foundation for those statements. And I also object because
23 this -- the mining application when it was filed contained
24 only one year of surveys. I don't know what these other two
25 years are, but they weren't part of the mining application.

1 Same objection I made before. I think he's talking about
2 things that have been subsequently conducted, were never
3 subjected to MDEQ review or public comment and should not be
4 admitted or considered in the record.

5 MR. PREDKO: As far as the foundational objection,
6 your Honor, he will provide the foundation for all of these
7 conclusions. We just wanted to get the court and everybody
8 else here a roadmap as to where he was going to go before he
9 did it. Some courts allow those types of conclusions to be
10 stated prior to the bases of the conclusions and in this
11 informal forum I not only think it's appropriate but I think
12 it's helpful to the court to tell the court where we're
13 going. And certainly these are all subject to cross-
14 examination.

15 As to the second objection, talking about studies
16 that were done since the mine application, the court knows
17 that we are not limited to the mine application itself; and
18 in fact, what we're doing here is establishing a new record
19 upon which the DEQ will make a final decision on this permit
20 and those additional surveys are part of this new record,
21 your Honor.

22 JUDGE PATTERSON: That's true and I'll overrule
23 the objection. And I'll also overrule the foundational
24 objection. I suppose in a sense it's a backwards way of
25 doing it, but it is an illustrative thing.

1 MR. WALLACE: Well, I --

2 MS. HALLEY: And, your Honor, we maintain our
3 objection to this notion that somehow these proceedings are
4 wide open to new information that the DEQ never had before
5 it when it was making its decision.

6 JUDGE PATTERSON: I understand that.

7 MR. WALLACE: Well, then I won't go on, but I'd
8 like to reserve the rest of my objections to present -- I
9 don't want the record to suggest that we are accepting the
10 admissibility of these conclusions not having heard the
11 foundation. He's doing it in a backwards way.

12 JUDGE PATTERSON: Right.

13 MR. WALLACE: I understand all rights are
14 reserved. If that's correct, then --

15 JUDGE PATTERSON: Yeah, that's fine.

16 Q Mr. Kailing, have you also formed conclusions about the
17 potential impacts of the mine?

18 A Yes, I have.

19 Q And again, these conclusions don't relate to potential
20 impacts of chemicals or particulates; correct?

21 A That's right.

22 Q All right. Can you tell us what conclusions you formed
23 about potential impacts of the mine?

24 A They're shown on this PowerPoint slide number 5 under the
25 heading, "Impacts of Mine."

1 "Impacts on wildlife from construction and
2 operation of the mine will be effectively limited to
3 the 'footprint' of the mining facility. Any impacts
4 outside the 'footprint' will be minimal. No threatened
5 or endangered wildlife species were identified within
6 the 'footprint' of the proposed mine. Habitats within
7 the 'footprint' are very common. They do not provide
8 critical habitat for any threatened, endangered species
9 known to occur in Marquette County. The common
10 wildlife species identified within the study area will
11 relocate to adjacent similar habitats. And finally,
12 any impacts to wildlife will be temporary as the
13 'footprint' of the mine will be returned to a native
14 flora and wildlife species will reoccupy the site."

15 Q Now, let's talk about your involvement with the Eagle Mine
16 project. When did you become involved with this project?

17 A 2006.

18 Q And where were you working at the time?

19 A At King and MacGregor Environmental.

20 Q And what was your position at that time?

21 A I was a project manager and worked as a field biologist.

22 Q And in general what was King and MacGregor retained to do
23 for the project?

24 A They were asked to conduct baseline ecological studies that
25 would be used in anticipation of a permit application.

1 Q And what was your role for King and MacGregor with respect
2 to the studies?

3 A My role was to review the project and the proposal and to
4 make suggestions as to a sampling methodology that could be
5 used to help establish this baseline data.

6 Q Did you actually conduct surveys yourself?

7 A Yes, I did, in 2006 and 2007.

8 Q And did you prepare reports for those surveys?

9 A Yes. My duties also included compiling the field data and
10 writing the reports associated with the field work.

11 Q And let's talk about those site-specific baseline surveys.
12 Have you prepared a demonstrative slide?

13 A Yes.

14 Q Okay. What was the purpose of the site-specific surveys?

15 A The purpose of the surveys was "to establish baseline
16 ecological conditions within the study area, in order to
17 analyze potential ecological impacts from the proposed
18 mine."

19 Q Now, what surveys were done of the Kennecott mine area?

20 A A survey was conducted for wildlife and threatened species
21 in 2004, a second similar study was conducted in 2006 for
22 wildlife and threatened and endangered species, and then in
23 2007 a study for wildlife and threatened and endangered
24 species.

25 Q And in those surveys for each of those years: 2004, 2006,

1 2007, what specific types of wildlife were surveyed?

2 A Each year surveyed looked at the presence of birds and small
3 and large mammals, frogs and toads, threatened and
4 endangered species.

5 Q And just in general without getting a specific definition,
6 what do you mean by "threatened and endangered species"?

7 A Those are species that are given legal protection under Part
8 365 of the Michigan Natural Resource Act and they are
9 afforded legal protection due to their limited numbers.

10 Q And what I'd like to do here -- I don't intend to go through
11 each year survey, but I'd like to take an example, just one
12 of the surveys, to show the court the methods and kinds of
13 things that were done to complete the surveys. Okay? And
14 we're going to put on the screen here Intervenor Proposed
15 Exhibit 160. Now, this is the cover page. Do you recognize
16 this?

17 A I do.

18 Q And what is this report?

19 A This was a report based on our 2006 field work at the
20 project area.

21 Q And were you involved in conducting those studies?

22 A Yes, I -- yes, I was.

23 Q And were you involved in preparing this report?

24 A Yes, I was.

25 Q And we're looking at the table of contents for this report.

1 And what year was this study conducted again?

2 A The field work was conducted in 2006.

3 Q And again, please, the areas that you looked at according to
4 this table of contents were what, sir?

5 A We reviewed birds, mammals -- both small and large mammals,
6 frogs and toads and threatened and endangered species.

7 Q And what was the study area for these surveys? We're going
8 to put a figure up on the screen here. I'm just waiting for
9 technology. I think you may have a laser pointer up there.
10 And if you can show us -- it's kind of dark on the screen
11 but if you could, tell us about the study area.

12 A Well, the study area is an irregular-shaped region of about
13 1,360 acres, basically where my laser is wandering around.
14 It's associated with the Triple A Road; it kind of bisects
15 it.

16 Q Would it be easier to go up and point to the screen for you?

17 A There's a red line here that's difficult to distinguish
18 because of the interference of the light. But maybe from
19 your perspective it's easier to see. That red line provides
20 the boundary of the study area.

21 Q Now, next I'd like to go through just generally each type of
22 study; the bird study, the mammal study, the frog-and-toad
23 study and the threatened and endangered species study; and
24 tell the court essentially how those were done. And let's
25 start with the bird study.

1 A The bird study would start with a literature review of
2 published materials relevant to the study area. So we would
3 look at the Michigan Breeding Bird Atlas, for example,
4 popular birding guides that cover the region. We looked at
5 DNR data, Michigan Natural Features Inventory, "Threatened
6 Endangered Species List" review for the area, air
7 photography, topographic maps. That would be step one.

8 Q How about bird calls?

9 A And once you compiled that data and you had a list of birds
10 you might expect to be present in that area, you might do a
11 little further research -- and we did -- to listen to their
12 calls, read up on their natural history, so as to be
13 briefed. If you saw them in the wild, you'd be able to
14 recognize them right away.

15 Q And how did you determine where to look in the study area
16 for birds?

17 A Once you have the background materials prepared and
18 reviewed, then you'd want to do your field work in areas
19 where you'd have the best chance of seeing birds, since the
20 object is to document their presence. And that would
21 involve an arrangement of transects and sampling points,
22 which I'll explain in more detail.

23 Q Now, can you tell me what is a transect?

24 A The transect is an imaginary line. And on the slide up here
25 you'll see these yellow vertical lines. Those are imaginary

1 lines that were laid out over representative habitats within
2 the study area. It's important to look in the different
3 habitats because birds are associated with the habitats that
4 they like. So if you want to identify the maximum number of
5 species, you would go to where they live. So the transects
6 are used as a grid, basically a guide, to help establish the
7 points. And the points are just dots on a map within or
8 adjacent -- each of the representative habitats on site.
9 And these are numbered consecutively.

10 Once you establish these imaginary points on a
11 map, then you would go to the field with a surveyor or GPS
12 and plot those coordinates on the ground and drive a stake
13 or hang a ribbon or put in a metal stake with an identifier
14 on it, so that you could come back to that site over and
15 over through the years.

16 Q And this method using transects and sampling points, is that
17 a generally accepted method within your area of study?

18 A Yes, it is. It's commonly used for birds, mammals, a
19 variety of species.

20 Q And specifically for birds, is there any particular treatise
21 or authoritative resource that you relied on to establish
22 the --

23 A Yes, we did. The trend today, most researchers are using --
24 or many researchers at least are using survey points and
25 what they call a point survey, where you stand at that point

1 on the ground for a length of time and write down every bird
2 you hear or see over a time period. Our case, we use ten
3 minutes; watch and write every bird down in a ten-minute
4 period, which is a pretty standard practice. We space those
5 points throughout a variety of habitats, not too close to
6 one another, so as to get a lot of overlap with birds heard
7 from multiple points, but spread out enough so as to cover
8 the representative habitats.

9 Q What time of year were the surveys done, the bird surveys?

10 A Typically they're conducted in the spring or early summer
11 during the breeding season; June, early June; and then again
12 during the fall migration time, which in our case we chose
13 mid, late September. You would want to sample then because
14 birds are active during the breeding season. Males are
15 singing and females are displaying and building nests, and
16 they're carrying on with their courtship activities. So it
17 makes them easier to see and to hear. And in the migration
18 time frame you would catch species who may breed elsewhere
19 but are passing through your region. So doing those two
20 together in the same calendar year gives you the maximum
21 chance to catch the most species that use or pass through
22 the area.

23 Q And for this 2006 study that we're looking at, were those
24 two surveys done, the breeding and migration?

25 A Yes.

1 Q What time of day were the surveys done?

2 A A bird survey in the breeding season in particular is best
3 conducted in the early-morning hours, because birds are most
4 active then. They tend to get quieter during the day. A
5 migration survey is effective in morning or afternoon,
6 because some species, depending on the weather and whether
7 you're looking at raptors or songbirds, could be just as
8 active or even more active in the afternoon as in the
9 morning, if it's a cold September, for example. But
10 generally with birds you want to be out there in the
11 morning. And we try to survey all of our sites in the
12 morning. We staggered our review of them so that the points
13 we looked at very early in the morning on the first day we
14 looked at later in the morning on the second day, to try to
15 even out any bias that way.

16 Q Now, you said that you were one of the people who actually
17 went out and did the bird survey?

18 A That's right. Yeah, I was the team leader for our crew of
19 four experienced biologists.

20 Q Now, do you believe it's important that people conducting
21 this type of survey be trained biologists?

22 A Yes. They have to be what you'd call a good birder, to be
23 able to hear and to see and identify birds relatively
24 quickly, to be able to accurately account for what's
25 present.

1 Q And you talked about the point count. Did you then record
2 results in the field?

3 A Yes. You have a data sheet with you on a clipboard, and
4 usually you hand-write those in. And the data sheet would
5 include what species, how many you saw, and anything notable
6 about its behavior. Was it nesting? Was it feeding? Was
7 it in flight? That sort of natural history tidbit.

8 Q And then what do you do with those data sheets after the
9 survey has been completed?

10 A You compile that data typically into a spreadsheet format,
11 to be able to condense it and review it readily.

12 Q We've put up on the screen here a portion of Table 2-1 to
13 that 2006 wildlife survey. Now, is this the kind of
14 spreadsheet that you were talking about?

15 A Yes. This slide is an excerpt of one of our summary tables
16 from the June 2006 survey event. ON the left we have the
17 sampling point, which is one of the points on the ground I
18 mentioned that's identified -- in this case it was labeled
19 T1B1 -- the date that we were out there and the species.
20 And this top line was a Pine Warbler, the scientific name of
21 Pine Warbler. And it was the two occurrences of the bird,
22 meaning two were seen in that same ten-minute sample time
23 frame. And it was heard, auditory, meaning we didn't see it
24 heard but we heard the particular song of that species.

25 And on the left these first -- from the Chipping

1 Sparrow on back up to the Pine Warbler were all the species
2 that were identified at that sampling point, T1B1.

3 Q Now, is this type of spreadsheet standard in the industry as
4 far as reports go?

5 A Yes, it's pretty typical.

6 Q Now, in general what were the results of the 2006 bird
7 survey?

8 A Well, we had approximately 48 species if I recollect. And
9 they were common species we expected to find in the habitats
10 that were present.

11 Q Can you give some examples of the types you saw?

12 A Yeah. Some of the most common birds in 2006, if you lump
13 the June survey and September survey together, would include
14 Black Capped Chickadee, Yellow-Rumped Warbler, raven, Canada
15 goose.

16 Q Now, the other surveys that were done in the other years,
17 the 2004 and 2007 surveys, did they have similar results?

18 A They did.

19 Q Now, you were here for Dr. Lindsey's testimony, weren't you?

20 A Yes, I was.

21 Q And it's been suggested that studies should have been done
22 for 12 months each year. Do you remember that?

23 A Yes, I remember that.

24 Q Is that standard in the industry?

25 A No, that's not standard.

1 Q Have you ever seen studies done that way?

2 A I don't know of a study that intensive, no.

3 Q Are you aware of any authoritative text that recommends
4 doing studies 12 months out of the year?

5 A No, I'm not.

6 Q And what do the authoritative texts recommend, as far as
7 when to do studies?

8 A Well, typically in a general census like we're trying to
9 accomplish here, you would do a breeding bird survey during
10 the peak of the breeding season and then a migration survey
11 during their migratory time frame.

12 Q And that's what was done in these three annual surveys?

13 A Yes.

14 Q Do you believe that the surveys that were done of the study
15 site produced an accurate representation of the bird species
16 that are on the site?

17 A Yes, they did. I would consider them a snapshot in time.
18 When we were out there, the species we identified were
19 present and we expected them to be there, based on the
20 habitat types on the study area.

21 Q Now let's move to the 2006 mammal study.

22 (Off the record interruption)

23 Q And we brought up a page of the report. Now, can you tell
24 me about the methods that were used to study small mammals?

25 A The approach is similar to the bird survey approach, wherein

1 you would conduct review of published information about
2 mammal presence in the study area. The classic test in
3 Michigan is Al Kurta's Mammals of the Great Lakes Region
4 book. We looked at other published information. We looked
5 at surface resources via air photography and topographic
6 mapping. And a query was made to the Michigan Natural
7 Features Inventory to see if they had any known occurrences
8 of threatened or endangered mammals in the study area.

9 Q Now, when you're doing your literature review, is it
10 important to look at the habitats, or preferred habitats of
11 the species?

12 A It is. And generally you would accomplish that through
13 review of aerial photography, where you can generally depict
14 the land types of habitat types from the aerial imagery;
15 forest versus woodland versus wood -- or wetland, rather,
16 versus grassland versus urban developed area. So it's
17 pretty easy to characterize a landscape that way. That
18 would give you a pretty good indicator of the mammals that
19 are present.

20 Q We're going to bring up the aerial view of the study area.
21 And can you explain to the court just in general the types
22 of habitat that are within the 1300-acre study area and
23 point them out if you can, please?

24 A Well, the dominant system here is Jack Pine, mixed conifer
25 upland stands. And they range from the cut-over areas,

1 which are the light gray, typically, here (indicating),
2 here, and then over in here, here, here. They're in various
3 stages of regeneration. You have these darker green patches
4 are more mature conifer cover, usually dominated by Jack
5 Pine or other mixed conifer; red pine, white pine, spots
6 like that. A little area like this (indicating), these
7 little islands of conifer stands. You have a mix of Mesic,
8 aspens, oak, again cut-over in areas here between Triple A
9 Road and the Salmon Trout River. That's a relatively small
10 area of the overall study area. And then within the wetland
11 systems you have spruce bog or spruce with balsam fir
12 complex associated with riparian areas here and in here.
13 And within that you'd have some open bog or emergent
14 wetlands immediately adjacent to the water bodies. That's
15 generally what you have in the study area for habitat types.

16 Q We're bringing up the Figure 2.1 from this 2006 report which
17 shows the transects. Tell me how you surveyed for the small
18 mammals with respect to the transects.

19 Q Well, these transects -- again, the transects are just
20 imaginary points -- lines, rather. The important thing here
21 from this slide are these dots. These dots are the actual
22 points on the ground where we stood to conduct our surveys.
23 And they were established within or adjacent to the existing
24 habitats on the site so as to maximize our opportunity to
25 see the species that live in those habitats. We did that

1 for the birds. And mammals, of course they're dependent on
2 vegetation types as well. So we sampled those same exact
3 locations for mammals. And what we did was, we basically
4 sampled every other point, again keeping in mind that they
5 used -- we did sample all the habitats present, and we were
6 able to do that by alternating. We sampled 12 of the 21
7 locations for small mammals. And those 12 sampling
8 locations covered the habitat types on site.

9 Q And what was the method of identifying or capturing small
10 mammals?

11 A We identified small mammals through a trap system. We used
12 one live trap and three snap traps at each of the 12
13 sampling points. One large rat trap and then two smaller
14 mouse snap traps. And then a standard Sherman 4-by-12 box
15 trap, all baited, all set within about a meter, maybe up to
16 two meters from the actual point itself, where it was staked
17 or flagged. Then we would deploy those traps in areas that
18 appeared to have mammal presence, either a runway or
19 adjacent vegetation or a fallen log or understand leaves or
20 somewhere to optimize the optimize the opportunity for small
21 rodents to find our sets.

22 Q Is that a standard and generally accepted way of sampling
23 small mammals?

24 A It is. And then we check those sets once every 24 hours,
25 and we did that three times, usually consecutive days.

1 Q And in the 2006 survey, what kinds of small mammals did you
2 find?

3 A Not a lot of diversity. I think we had maybe five species:
4 Eastern chipmunk, white-footed mouse, red squirrel, species
5 like that. No threatened or endangered small mammals.

6 Q And for large mammals how do the survey methods differ?

7 A Large mammals are a little more difficult to capture. So
8 rather than any kind of elaborate system where you'd
9 actually catch a specimen to examine it, you would conduct a
10 survey based on direct observation, where you see, like, the
11 deer or the moose. Or you look for indirect evidence such
12 as feeding sign, scat or droppings, tracks, vocalizations of
13 certain animals. That's a typical method to survey for
14 their presence.

15 Q And in general what kind of results did you have in 2006 for
16 large mammals?

17 A I recollect that the white-tail deer is the only one we
18 observed. But there was ample evidence of tracks of
19 rabbits, for example, porcupine, coyote, wolf, beaver,
20 muskrat associated with the riparian areas; species like
21 that.

22 Q Now, did the 2004 and 2007 surveys yield similar results?

23 A Yes, they did.

24 Q Did you find any large or small mammals that you would think
25 were unusual for the area?

1 A None that were unusual.

2 Q Now, Mr. Kailing, you were here for Dr. Flaspohler's
3 testimony; right?

4 A Yes, I was.

5 Q And Dr. Flaspohler was asked a question about what is a
6 common small mammal, I think, or what is the most common
7 small mammal. Do you remember that?

8 A Yes. He was asked what was the most small mammal on the
9 study area.

10 Q And do you remember what his answer was?

11 A I think he offered -- it was a mouse or a red squirrel? I
12 think he offered mouse.

13 Q And it's the red squirrel that I'm getting at here. And Dr.
14 Flaspohler testified that in the 2004 survey he was
15 surprised that no red squirrels were found during the
16 survey. Do you remember that testimony?

17 A Yes, I do.

18 Q Now, you have, as you said, reviewed and relied on that 2004
19 survey; correct?

20 A I did.

21 Q Do you agree with his testimony?

22 A No. He must not have read all the report, because the data
23 sheets are full of encounters with red squirrels. And we
24 encounter them often in our field work as well.

25 Q I'm showing you a spreadsheet, transect data from the 2004

1 Wildlife Species Survey. And these are different transects
2 by number here. Do you see red squirrels identified in the
3 survey?

4 A Yes, I do. And it looks like they're listed in each of
5 the -- transect number 4 shows red squirrel twice seen.
6 They saw evidence of shelled cone piles present. Red
7 squirrels are busy little creatures, and they shuck the
8 seeds out of cones and leave the remnant shell of the cone
9 in little distinct mounds. That's pretty typical of their
10 behavior. And along another transect they saw or heard 15
11 different red squirrels, so that was a busy day. And then
12 on the 6th transect again they had numerous occasions to see
13 the shelled cone piles present.

14 Q And then here's the last transect. And again do you see red
15 squirrels identified there?

16 A Yes. It looks -- it describes them as being numerous.

17 Q And "numerous" for purposes of that survey meant what?

18 A More than 15 individuals. I don't know what else "greater
19 than 15" would mean. I presume they mean the number of
20 individuals.

21 Q Now I'd like to move on to the frog and toad survey for
22 2006. And we're going to put up on the screen here that
23 section of your report. While we're waiting for that page
24 to be brought up, Mr. Kailing, can you tell me generally
25 what method or protocol was used to survey the frogs and

1 toads?

2 A Frogs and toads are best sampled during the spring breeding
3 season. And the Michigan DNR has a pretty detailed
4 guidelines on how to go about sampling for them. And it
5 involves being out in the spring during the right time frame
6 when they're breeding, when the temperature -- the air
7 temperature is warm enough that they're active. And then
8 you listen quietly and enumerate the species by their
9 distinct voices and write that data on a datasheet.

10 Q And prior to doing the studies, did you do any kind of
11 research or literature review?

12 A Yes, similar to the other surveys. We conducted a
13 background review of the area and published information
14 about known frog and toad presence in the region. The field
15 points were established, and really the three points were
16 established along the Salmon Trout River, which about the
17 only area in the study area that has a pond of water that
18 would hold a significant population of frogs or toads. And
19 three points were established adjacent to the Salmon Trout.

20 Q And we're brining up the transect aerial. And can you point
21 out for us the sampling points for the frogs and toads?

22 A They're marked with a triangle if you can see them. There's
23 one here (indicating), one there and then the third one up
24 here close to the orebody.

25 Q When you were at the site study area, did you see any vernal

1 ponds?

2 A We did not observe any vernal ponds.

3 Q And generally in 2006 what were the results of the frog and
4 toad survey?

5 A We picked up three common species. I think it was a spring
6 peeper, green frog, wood frog. The spring peepers are the
7 most common.

8 Q And the 2004 and 2007 surveys, did those have similar
9 results as far as frogs and toads?

10 A I think it was generally similar, yes.

11 Q I'd like to move next to the area of threatened and
12 endangered species. And you gave us a general description
13 of "threatened and endangered." Are these categories that
14 the MNFI Inventory uses?

15 A They use them to help characterize the species. But the
16 Michigan Department of Natural Resources has the authority
17 to classify them as to their status, where threatened and
18 endangered species are concerned or not classified.

19 Q And you went through them. But these MDNR classification,
20 can we go through them one-by-one and have you explain to
21 the court what they are?

22 A Sure. Generally a species of concern are species that are
23 known to be in decline throughout their range or most of
24 their range, meaning their population is shrinking, not
25 growing; or that they population status is unknown because

1 it just hasn't been studied or data is not available or
2 they're difficult to ascertain. Threatened species would be
3 wildlife whose population is in decline. It's been known
4 and it's documented. And they are in peril usually
5 regionally or globally. And then endangered species would
6 be those species which are past being threatened and it's
7 readily apparent that they could become extinct. Small
8 localized populations and active management would be needed
9 to help them recover.

10 Q And which classification are legally protected?

11 A Endangered species are legally protected and threatened
12 endangered species are legally protected. Species of
13 concern are not. That's more of a watch list, but it's
14 not -- species of concern are not afforded protection under
15 the Threatened and Endangered Species Act.

16 Q We've put up on the screen here the text of the 2006 survey
17 for threatened and endangered species. Can you describe the
18 methods that were used to search for threatened and
19 endangered species?

20 A We relied on the Michigan Natural Features Inventory. We
21 made a query to see if any known occurrences of protected
22 species were within the study area.

23 Q Now, what is the Michigan Natural Features Inventory?

24 A The Michigan Natural Features Inventory is an organization
25 that basically maintains the database of all known

1 occurrences of threatened and endangered species. They have
2 a staff of biologists that go out and conduct surveys.
3 They're responsible for keeping the list up-to-date and
4 recording documentation of new locations of threatened and
5 endangered species. They're associated with Michigan State
6 University. And that's their main function, is to maintain
7 this database.

8 Q And when you did your Michigan Natural Features Research,
9 how broad of a search did you do for the study?

10 A Well, for a background we looked at the study area, and then
11 we also looked at the MNFI list for Marquette County.

12 Q And when you say "the study area," what do you mean?

13 A The 1,360-acre study area.

14 Q So you looked at the specific geographic coordinates for the
15 study area?

16 A Yes.

17 Q And also the countywide data?

18 A That's correct.

19 Q And that Michigan Natural Features Inventory data, how many
20 years of data are in that database?

21 A Well, it's comprehensive of all species documentation since
22 people first started doing it. So there are samples,
23 especially of plant communities, which were surveyed
24 earliest in the settlement of Michigan. It would be dating
25 back to the 1800s.

1 Q And what other literature did you review or research in
2 connection with the threatened and endangered species
3 survey?

4 A Again, we looked at published information such as the
5 Breeding Bird Atlas, Kurta's mammal book, other agency
6 information like the Fish & Wildlife Service or Forest
7 Service where you would just do a Google on the region to
8 see what they had for evidence.

9 Q And the features inventory, in addition to giving
10 classifications, does it also provide literature about each
11 of the species?

12 A Yes. In addition to the known locations there is either an
13 abstract, which is a brief -- summary abstract, which is a -
14 - sometimes it's just a sentence or a paragraph or two.
15 Other summaries are quite detailed and would be pages long
16 and give an account of the species' history in the state,
17 its known occurrences, its habits, its preferred habitat,
18 its natural history, which would include its behavior or
19 reproductive success, migration patterns if that is
20 appropriate, kind of a case study of the species. And it
21 will explain why it's listed and usually recommend some sort
22 of habitat management or make some recommendations of what
23 can be done to help the species.

24 Q Now, did you review the habitats of the species -- potential
25 endangered species in the area?

1 A Yes.

2 Q And why is it important to review their habitats?

3 A Well, to help you guide you in case you have that sort of
4 habitat within your study area. Then you would want to be
5 aware of that creature's presence, and it would help you to
6 know that if you knew it might possibly be there.

7 Q And was that done in your studies?

8 A Yes.

9 Q Now, once you've done the research and the literature
10 review, tell me then how the threatened and endangered
11 survey was conducted.

12 A We're looking for threatened and endangered species -- while
13 doing our bird surveys we're looking for threatened and
14 endangered birds. While doing our mammal surveys we're
15 looking for threatened and endangered mammals. During our
16 frog and toad work we're listening for endangered frogs and
17 toads. So basically you are aware of the species that might
18 be present. You're keeping an eye and ear out for them
19 while you're conducting your point surveys.

20 I should note, too, one of the criteria for bird
21 study and mammal study was that any species encountered
22 while we were on the project site; for example, walking from
23 one point to another or breaking for lunch or entering the
24 site in the evening or going home in the evening; if we
25 encountered species that weren't previously documented

1 during our formal surveys, those were also recorded as being
2 present on site.

3 Q Now, taking the three surveys; the 2004, the 2006 and 2007;
4 what were the results of all three years with respect to
5 threatened and endangered species?

6 A We identified four species within the study area. That
7 included a merlin, a bald eagle, gray wold and osprey.

8 Q And let's talk about those one-by-one. Let's talk about the
9 bald eagle. Now, how was the bald eagle identified?

10 A It was seen flying overhead, I think every time it was
11 encountered or noted. And it wasn't noted as perching or
12 foraging. No nest site was identified. So the eagle was
13 most likely a transient through our study area. They prefer
14 habitats that have more open water than we did, large,
15 expansive lakes undeveloped with a healthy fish population
16 where they would eat and forage and perch and spend a lot of
17 their time. Our site might be pass-through country for
18 eagles, but I really don't think that it's an appropriate
19 habitat that eagles would even nest in or have a favored
20 roost site or otherwise use it as part of an important --
21 part of their home range.

22 Q Now, does the study area contain critical habitat for the
23 bald eagle?

24 A No.

25 Q Does the MDNR keep track of bald eagle nests?

1 A They do a monitoring program. They do an annual survey of
2 nest locations across the state.

3 Q Are there any bald eagle nests known in or near the study
4 area?

5 A I'm not aware of any, no.

6 Q And in your research what did you find with respect to the
7 nearest bald eagle nest?

8 A The MDNR indicated there wasn't anything within
9 approximately six miles of the study area.

10 Q Next let's talk about the osprey. First of all, what is an
11 osprey?

12 A Well, an osprey is a fish-eating bird, big. It's smaller
13 than an eagle but bigger than most other raptors. And they,
14 too, prefer open, shallow water areas where they can feed
15 and roost and have large line-of-sight distances for
16 security. And the observation was a fly-over with the
17 osprey again, so I suspect it could either be migrant,
18 passing through. Who knows? You know, they cover a lot of
19 landscape in a day, both the eagle and the osprey.

20 Q Now, does the study area contain critical habitat for the
21 osprey?

22 A No.

23 Q And what is the preferred habitat of the osprey?

24 A Large marshes or lakes with shallow water of abundant fish
25 population, abundant dead snags or trees with a few limbs

1 that they can perch on or nest in.

2 Q And the gray wolf, can you tell us about the gray wolf?

3 A I saw the tracks I think twice of a gray wolf on the study
4 area. It was just one individual or two at the most. And
5 they were tracks in sandy dirt trails. And they were linear
6 and moving fast. You could tell by the length of the stride
7 in between the prints, which tells me they're just making
8 time, heading from one area to another. I spoke with DNR
9 wolf biologist Brian Roell about wolves in the Yellow Dog
10 Plains area, and he indicated to me that primarily wolves
11 could be found anywhere in the Upper Peninsula in the
12 growing months; summer, May through October. They break up
13 their packs and they just wander. And you can see them
14 anywhere in the UP at any time. In late fall and winter
15 they form up packs. And he was not aware of any known pack.

16 MR. WALLACE: Excuse me. I didn't know how long
17 the hearsay would go on, but it's gone too long. If they
18 want to call this gentleman -- who is an expert on wolves, I
19 would acknowledge -- to testify, that would be fine.

20 JUDGE PATTERSON: A little hearsay is okay but not
21 a lot?

22 MR. WALLACE: I just wanted to see where it was
23 headed.

24 Q Well, what's your understanding, Mr. Kailing, of wolf
25 populations within the Yellow Dog Plains?

1 MR. WALLACE: Well, I'm going to object. He's
2 calling for hearsay in a different way, the old-fashioned
3 way.

4 MR. PREDKO: He can talk about his understanding.

5 MR. WALLACE: Well, then I'm --

6 JUDGE PATTERSON: But based on what?

7 MR. WALLACE: Based on talking with this
8 gentleman?

9 Q Now, were any wolf dens identified within the study area?

10 A No.

11 Q Does the study area contain critical habitat for gray
12 wolves?

13 A Not in my opinion, no.

14 Q In your opinion, based upon your experience and work, what
15 was the gray wolf doing at the site?

16 A As I mentioned, passing through the area; wandering,
17 essentially.

18 Q Let's talk about the last identified threatened and
19 endangered species, the merlin. What is a merlin?

20 A A merlin is a small hawk, a forest hawk, from the same
21 family as a sharp-shinned or a Cooper's hawk.

22 Q And how was the merlin identified within the survey?

23 A That, too, was seen as a fly-over, meaning it was in flight.
24 The observer saw it moving from one side of the sky to the
25 other. And merlins' main breeding habitat is in Canada; a

1 spotty occurrence throughout the UP. And no evidence was
2 seen of them nesting or foraging together or pair bonding or
3 any of that sort of activity. It was just one lone
4 individual. So this likely is a pass-through.

5 Q Now, in 2004, 2006 and 2007 when these surveys were done,
6 you said all four of those animals were identified or
7 character classified as threatened?

8 A That's right.

9 Q What is the current status of these animals?

10 A They're currently listed as threatened; however, the DNR
11 here put out a suggested list, an updated list of the
12 threatened and endangered species database. And there are a
13 series of hearings being held to look at their suggestions
14 to alter that list. And the alterations include removing
15 the osprey, the bald eagle and the wolf from the threatened
16 -- state threatened list.

17 Q And why is the DNR recommending removing them from the
18 threatened list?

19 A They're doing that because the populations have stabilized
20 and are increasing across the range within Michigan. So
21 that would prompt their removal.

22 Q Next I'd like to talk about the Kirtland's warbler. What is
23 a Kirtland's warbler?

24 A Kirtland's warbler is a small songbird in the wood warbler
25 family. It's rare; that's why it's endangered. It's rare

1 because it nests only in a specific age class of Jack pine
2 located mostly in northern lower Michigan and spends its
3 winters in the Bahamas. It's a neo-tropical migrant like
4 all wood warblers.

5 JUDGE PATTERSON: Smart bird.

6 Q Now, was the Kirtland's warbler identified in the study area
7 in 2004, 2006 or 2007?

8 A No, it was not.

9 Q Did there come a time where Kennecott requested that you do
10 a specific survey for the Kirtland's warbler?

11 A Yes. In 2006 we were conducting our breeding bird survey in
12 June. And ironically, the day we pulled into town the front
13 page of the Mining Journal had a picture of a Kirtland's
14 warbler on it, and it was noted as being identified in the
15 Yellow Dog Plains. So that got our attention and our
16 client's. And we were asked, based on that information --
17 and it appeared, based on the popular press, that it was
18 maybe a mile or so away from our study area. So we were
19 asked to survey appropriate age class Jack pine within our
20 study area and take an extra effort to look for the
21 Kirtland's warbler. So we added ten sampling points and two
22 meander survey transects to try and detect the Kirtland's
23 warbler in or near or study area.

24 Q And in general what methods were used?

25 A We used the point survey method and the meander survey.

1 Q Now, was that a proper survey method to survey for the
2 Kirtland's warbler?

3 A It is. It's a commonly used method and it's a method used
4 by DNR staff when they do their annual census in the core
5 breeding area around Gaylord and Grayling. It's a method
6 used by Fish & Wildlife Service as well.

7 Q Now, did you expect to find a Kirtland's warbler within the
8 study area?

9 A I did not --

10 Q Why not?

11 A -- for several reasons. Primarily, a Kirtland's warbler --
12 and again, the individual was a lone singing male that was
13 detected. And Kirtland's warblers prefer large, contiguous
14 stands of Jack pine. 80 acres is a minimum; 200 acres or
15 more of contiguous Jack pine is better. And with scattered
16 openings and an age class of trees roughly 5 to 18 years
17 old. And similar in height, 5 to 18, maybe 20 feet in
18 height. This age class of Jack pine is the exclusive
19 breeding grounds for Kirtland's warblers. They build their
20 nests in the low-hanging branches of that age class of Jack
21 pine, using the herbaceous vegetation for cover and for
22 feeding. And they also have to be Jack pine stands situated
23 on very well-drained, sandy soils. So we didn't have large
24 contiguous stands of that kind of Jack pine in our study
25 area or immediately adjacent it. And herbaceous vegetation

1 layer was quite sparse as well. So for those two reasons I
2 didn't expect that the Kirtland warbler would spend much
3 time, if any time, in our study area.

4 Q I put up on the screen he an aerial of the site.

5 MR. PREDKO: For the record, it's Figure 3.4 of
6 the wetland delineation attached to the Environmental Impact
7 Assessment.

8 Q Now, you described that the preferred habitat is Jack pine
9 stands?

10 A Uh-huh (affirmative).

11 JUDGE PATTERSON: "Yes" or "no"?

12 THE WITNESS: "Yes."

13 Q Can you show us where there are Jack pine stands within the
14 study area?

15 A Well, here (indicating) we have some Jack Pine in here and
16 in here of various age classes. Here's a more mature Jack
17 pine; here's a clean slate, really, a recently harvested
18 area. Here are some more mature Jack pine along here. But
19 to give you an idea of the -- we're looking at about a --
20 something like this is about 40 acres in size, so this would
21 be an 80-acre piece here. And there really isn't 80 acres
22 of the right age class present on the site.

23 Q Now, did your team diligently search for this Kirtland's
24 warbler?

25 A We did. The most appropriate habitat was up in here

1 (indicating). And this was fairly dense, a little old, a
2 little too mature but maybe useable. But we had a lot of
3 sampling points in this region, and we didn't detect it
4 there either.

5 Q And we put up on the screen here -- this is a report dated
6 July 18th, 2006. Do you recognize this report?

7 A I do.

8 Q And what is this report?

9 A It's a summary of our looking for the Kirtland's warbler in
10 2006.

11 Q And what were the results?

12 A We did not detect a Kirtland's warbler in our study area or
13 immediately adjacent it.

14 Q And did you prepare this report?

15 A I did.

16 MR. PREDKO: And for the record, this report is
17 actually in two places. It's part of Intervenor Exhibit 160
18 Bates stamped KEMC165824 through KEMC165882. And it is also
19 Intervenor Exhibit 25.

20 Q Have you done research to determine if there are any studies
21 on human disturbance and how it affects the Kirtland's
22 warbler?

23 A Yeah, I did a literature review on that, and I couldn't find
24 -- I found very little, virtually no scientific studies
25 about human disturbance on Kirtland's warblers.

1 Q Based on your own experience, is there any evidence that
2 leads you to believe that Kirtland's warblers are tolerant
3 of some human disturbance?

4 A Well, that little male was tolerant enough to let the
5 photographer get up to him with his lens and take his
6 picture for the newspaper. And then Dr. Lindsey was here
7 with another videotape of another singing male warbler, and
8 they were close enough to document it pretty well. There
9 are guided tours that are offered in the Gaylord/Grayling
10 area, within the core breeding area of the Kirtland's
11 warbler. These are free tours offered to the general public
12 to give exposure to the Kirtland's warbler. So you sign up
13 at the Holiday Inn in Grayling at 6:00 in the morning and
14 you take a tour bus out or caravan of cars. I did this last
15 summer, and there were about four cars. You drive right out
16 into their breeding habitat, park, get out, look with
17 binoculars and spy scopes, and you could see Kirtland's
18 warblers here to the wall, or a quarter of a mile away. And
19 they would do that every day, seven days a week, all through
20 their breeding season. Officially those areas are blocked
21 from the general public, but these tours get through. It is
22 also the Camp Grayling Military Base located almost in the
23 heart of the Kirtland's warbler habitat.

24 Q What goes on at that base?

25 A Well, it's everything you could imagine during a war.

1 They've got military troop movements, tank activities,
2 artillery, surface-to-air missile firing, helicopter, jet
3 aircraft use; a lot of noisy, loud military on goings. And
4 the Kirtland's warblers seem to be able to tolerate at least
5 some of that, 'cause they're still there. And in fact their
6 population is increasing quite well in the last decade or
7 so. So I think the anecdotal evidence is that, yeah, they
8 can tolerate some human disturbance.

9 Q Now, you said that you were here when Dr. Lindsey was here,
10 and you just mentioned the video that he showed?

11 A Right; yes.

12 Q Now, the video that he showed, was that a male or a female
13 in the video?

14 A That was a singing male.

15 Q And I think Dr. Lindsey said that he was possibly singing
16 for his female. Would you agree with that?

17 A Yes.

18 Q And have there been -- are you aware of any other sightings
19 of Kirtland's warblers within the Yellow Dog Plains or
20 anywhere near the study area since then?

21 A I am not aware of any.

22 Q In your opinion, what was that singing male doing in the
23 area?

24 A Well, he either deliberately went to that site or he was
25 blown off course by a storm event or got lost. And typical

1 dispersion methods for songbirds, including Kirtland's
2 warblers, you've got to have some adventuresome souls who go
3 out to new areas and try to establish new territory to
4 breed. So he was out there singing. And Kirtland's
5 warblers are interesting in the wood warbler family.
6 They're quite persistent. They sing many minutes during the
7 day, and they sing for a long period of time if they don't
8 find a female to nest with. So he's out there as a pioneer
9 trying to find a female. And there's evidence that if they
10 don't successfully mate, they'll move to other habitats and
11 continue to try and do their thing.

12 Q Now, you mentioned that there is not an ideal habitat within
13 the study area for the Kirtland's warbler?

14 A That's correct.

15 Q Are there other places within the Upper Peninsula that are
16 specifically managed for Kirtland's warblers?

17 A Yes, there are. A number of agencies are involved with
18 Kirtland's warbler management. The core area of course is
19 in north central lower Michigan, in the Gaylord/Grayling
20 area, where they have tens of thousands of acres under
21 active management for Kirtland's warblers. In the UP the
22 Ottawa National Forest is involved with a 50-year plan, I
23 think it is, for Kirtland's warbler establishment. And the
24 Hiawatha National Forest is involved. The County of
25 Marquette has their own plant for some small acreage near

1 Gwinn I'm aware of. Seney Wildlife Refuge has some
2 properties they're trying to manage for Jack pine habitat,
3 including Kirtland's warbler. You add all that up, it's
4 tens of thousands of acres over at least 50 years of
5 dedicated Kirtland's warbler habitat. On top of that you
6 would have the Baraga Plains, Mulligan Plains and other
7 sandy-soil, Jack-pine-dominated areas that have a potential
8 to be Kirtland's warblers' habitat.

9 Q Many other places for Kirtland's warblers to go?

10 A Well, yeah. Regionally within the UP, within northern lower
11 Michigan. And even if you look in the Great Lakes region at
12 Ontario, Wisconsin, Minnesota, there are other potential
13 habitats possible. We don't know enough about the birds'
14 historical range to know whether you would be occupying
15 formerly occupied range or we're seeing a spreading into
16 new, previously unoccupied habitats by the Kirtland's
17 warbler. But in any case, the required sand-dominated,
18 Jack-pine-stand habitat potential is in abundance.

19 Q Now, I understand as you said that they are managing certain
20 areas for the Kirtland's warbler in the Upper Peninsula.
21 But is the Upper Peninsula the heart of Kirtland's warbler
22 territory?

23 A No, it is not; no. That would be the lower northern
24 peninsula, the Gaylord/Grayling area.

25 Q And is the Upper Peninsula -- how would you describe the

1 Upper Peninsula as Kirtland's warbler territory? On the
2 edge?

3 A Well, that's a safe way to consider it. Fringe habitat.
4 There is documentation of individual birds going from the
5 core area around Gaylord up to the UP, even into Marquette
6 County and then back, in the same breeding season. So it
7 appears that the birds are aware of the area. They move
8 back and forth pretty readily. Again, we don't know about
9 its historical range. So given the fact that the population
10 is growing quickly, they're probably occupying available
11 habitats in the core area. So you have male birds who are
12 kind of looking for new home, 'cause it's kind of crowded
13 where they're at. So they tend to move into other areas.
14 So it might be a potential better range for the Kirtland's.
15 I don't think it will ever become a core breeding area like
16 the northern lower peninsula.

17 MR. PREDKO: Your Honor, I'm at a natural break
18 point within the testimony and it's about noon. Shall we
19 break for lunch?

20 JUDGE PATTERSON: Okay. Back at 1:00.

21 JUDGE PATTERSON: Mr. Predko?

22 MR. EGGAN: Judge, at about quarter to 2:00 I'm
23 going to leave for the day, and I know --

24 JUDGE PATTERSON: Can I go with you?

25 MR. EGGAN: Yes, you may. I'll give you a ride.

1 But I didn't want you to think it was because I don't care
2 about the case. It's just that I've got some other things I
3 can do this afternoon so --

4 JUDGE PATTERSON: Okay.

5 MR. PREDKO: I'm feeling a little bit put off, not
6 only have my whole team left but now opposing counsel is
7 leaving.

8 JUDGE PATTERSON: Dennis is still here.

9 MR. EGGAN: No. He's going with me.

10 Q Mr. Kailing, I've put up on the screen here what is
11 Intervenor Exhibit 386. Are you familiar with the Yellow
12 Dog Plains?

13 A I am and this is appears to be an aerial photograph of the
14 Yellow Dog Plains taken from high altitude.

15 Q And is this an accurate picture of the Yellow Dog Plains as
16 you know them?

17 A Yes.

18 MR. PREDKO: I would offer Intervenor 386 into
19 evidence.

20 MR. REICHEL: Just the photograph, Counsel?

21 MR. PREDKO: Just the aerial photograph.

22 MR. REICHEL: No objection.

23 MR. WALLACE: No objection.

24 Q Now --

25 JUDGE PATTERSON: Mr. Eggan, I didn't hear from

1 you.

2 MR. EGGAN: No objection, your Honor.

3 JUDGE PATTERSON: Okay. Thanks. No objection,
4 that will be entered.

5 (Intervenor's Exhibit 386 received)

6 Q Now, both doctors, Flaspohler and Dr. Lindsay, testified
7 that the Yellow Dog Plains as pictured here is a textbook
8 picture of what's known as a highly fragmented area. Would
9 you agree with that?

10 A Yes. I remember that testimony, and I do agree with him
11 that that is a highly fragmented area.

12 Q And based upon your experience and studies of the area, the
13 Yellow Dog Plains, what are the causes of the fragmentation
14 in the Yellow Dog Plains?

15 A Well, here it would be a matter of human activities,
16 primarily logging and the establishments of roads and trails
17 used to conduct the logging and then the use of those trails
18 thereafter by recreational users or other parties with
19 vehicle equipment.

20 Q Okay. And what kind of human activity or disturbance occurs
21 today or has occurred on the Yellow Dog Plains?

22 A Well, you can expect more logging activity since a good part
23 of the site is dedicated to rotational cuts of Jack Pine.
24 So you'd have forest management individuals in there;
25 loggers, foresters, civil cultural experts, researchers

1 working for the various agencies and the timber companies.
2 You'd have all your various recreational use that would
3 spread the gambit of four seasons. In spring you would have
4 fishermen, mushroom pickers, recreationalists driving
5 through, hikers. In the fall months, you would have
6 hunters, deer hunters, small game hunters with their dogs.
7 Everybody's got an ORV who is up there, or a lot of people
8 do anyway. That's used for all those purposes. You'd have
9 the houndsmen with their trucks and dogs hunting bear,
10 setting out bear baits, running coyote, bobcat. In winter
11 months you'd have snowmobilers recreating, camping in the
12 summer, cruise drives. Yooper style cruising I'd say.
13 There's a popular drive through this area that gets you to
14 L'Anse which is far off our map, but that's a popular
15 cut-across for local folks. Just in four-wheel drives or
16 passenger cars, they'll go from Big Bay, Marquette to L'Anse
17 and back and forth through the Triple A Road. So across the
18 four seasons you'd have all kinds of recreational users in
19 the area.

20 Q You mentioned Triple A Road. Is that a well-used shortcut
21 from Baraga to Marquette?

22 A It's a very popular one, and it's well-used in the summer
23 months and the fall.

24 Q And when you were visiting site, did you see people using
25 that road?

1 A Every day.

2 Q I'd like to move to your opinions about the impacts of the
3 proposed mine on the environment in the area in the Upper
4 Peninsula. Do you have an opinion as to what impact this
5 proposed mine will have?

6 MR. WALLACE: The same objection as to his
7 expertise and lack of foundation.

8 JUDGE PATTERSON: That can be noted.

9 A I do have an opinion, yes.

10 Q And what is that opinion?

11 A That the proposed mine will have a minimal effect on
12 wildlife species.

13 Q I'm sorry?

14 A That the proposed facility will have a minimal impact on the
15 wildlife within the study area.

16 Q Now, what impacts will there be? And we put up on the
17 screen here a figure from one of the reports. It's another
18 aerial photograph for demonstrative purposes. Can you
19 outline where you believe there will be impacts and describe
20 those impacts, please?

21 A The proposed above-ground mining facility that we are
22 calling the footprint, if you will, the immediate disturbed
23 areas, is about in here (indicating). And I think the
24 access road comes down through like this and basically ties
25 into Triple A Road, basically a long driveway from Triple A

1 Road to the main facility immediately north of the rock
2 outcropping which is here (indicating). Two habitat types
3 make up that area, both Jack Pine stands. The smaller is
4 this more mature Jack Pine mixed conifers, some red pine and
5 white pine in there as well but mostly Jack Pine, three to
6 six inch diameter maybe, well-stocked. And then outside
7 here are recently harvested -- relatively recently harvested
8 Jack Pine. Basically one large stand that has scattered
9 regeneration of white pine and some deciduous species and a
10 light herbaceous layer. And then here where the drive goes
11 there's a -- the most recently harvested Jack Pine stand in
12 the study area which is virtually open. And then again
13 another dense stand of conifers here along Triple A. So a
14 broad stroke, we've got two habitat types that will be
15 affected. Here the conifer Jack Pine and then the mature
16 Jack Pine.

17 Q Now, are either one of those habitat types rare in Michigan?

18 A No, they are not.

19 Q Are they rare in the Upper Peninsula?

20 A No.

21 Q Do either one of those types of habitats that are within the
22 footprint contain critical habitat for any threatened or
23 endangered species known to occur in Marquette County?

24 A No, they're not.

25 Q Did anyone of the three annual surveys identify threatened

1 or endangered species within the footprint of the mine?

2 A No, they didn't.

3 Q What kind of species were within this mine footprint?

4 A In the cutover Jack Pine areas depicted by the lighter gray
5 tones, you would see some open land birds like white
6 throated sparrow, Black-Capped Chickadee. Small mammal
7 presence would be kind of limited due to the lack of
8 vertical overstory, but you'd expect some white footed mice
9 in there, red-backed vole. Other birds might perch on the
10 edge of this here to sing and display. Within the more
11 mature Jack Pine, you would expect to find red squirrel.
12 Pine siskin, pine warbler would be a couple examples of
13 birds that will occupy that habitat. You might have a few
14 small mammals occupy the forest floor here. Again, the red-
15 backed vole or white footed mouse, chipmunk, red squirrel.

16 Q Are all of those species that you described common in
17 Michigan?

18 A They are.

19 Q Now, what effect will the construction and operation of the
20 mine have on species, say, within the footprint?

21 A Well, to the build the mine, they're going to have to clear
22 the site. They got a good start already with this clearing
23 here, and with the poor regeneration, this is essentially
24 open as well. Large portions of it are open. So they're
25 going to have to cut or brush hog those trees out of the

1 way, harvest this timber and then scrape the topsoil off.
2 The species that may show up to do their work, species that
3 occupy those sites, are going to be displaced into adjacent
4 similar habitats. Species that come in later; for example,
5 migrants or breeding season species that may come after they
6 begin work are going to have to go to again a similar
7 adjacent habitat to carry on their life. So there will be a
8 temporary displacement within that footprint of species that
9 no way would occupy it.

10 Q Now, will happen after closure of the mine?

11 A The plan includes removing all the infrastructure; the
12 buildings and the towers and the crushers and all of the
13 associated piping and even the concrete and footers
14 associated with it based on my reading of the application.
15 And then they're going to take the berm which is proposed, a
16 large earthen berm will circumnavigate most of the
17 footprint, and they'll spread that back over the disturbed
18 area. Then there's a native seeding plan to put on top of
19 the soil, vegetation will grow back, species that prefer
20 that habitat will reoccupy the site.

21 Q Now, as far as effect that may occur outside of the
22 footprint, again, you were here to hear Dr. Flaspohler
23 testify. And Dr. Flaspohler testified that the mine will
24 not create much of a new edge or fragmentation in the area.
25 Would you agree with that?

1 A I agree with that. The area is heavily fragmented as is.

2 Q Now, it's been suggested that the species who are now living
3 on the footprint site, when they are displaced, that when
4 they move off of the site, they will not be able to find
5 good habitat because of saturation and that this will cause
6 some sort of ripple effect for miles. Do you remember that
7 testimony?

8 A I do remember that.

9 Q And do you agree with that?

10 A No.

11

12 Q Why not?

13 A Well, an example of birds which we were discussing at that
14 point, the inference was that all the available surrounding
15 habitat will be occupied by similar species, individuals of
16 the same species and, therefore, the displaced ones wouldn't
17 have a place to set up home, so to speak, because of the
18 habitat is already occupied. But with songbirds in
19 particular there's a continental wide decline of neotropical
20 migrants for a variety of reasons and some not well
21 understood. But I think it's safe to surmise that this area
22 and probably the U.P. as a whole and the whole Great Lakes
23 region isn't saturated with neotropical migrants. And
24 available breeding habitat space isn't filled, so to speak.
25 So I think that the species could readily find similar

1 adjacent habitats and carry on.

2 Q It's also been suggested that increased road use will have a
3 substantial effect on wildlife. Do you recall that
4 testimony?

5 A Yes.

6 Q Do you agree with that?

7 A Could you repeat that question, please?

8 Q It's been suggested that increased road use by the trucks
9 from the mine will have a substantial effect on wildlife.
10 Do you agree with that?

11 A No, I don't. And the reason is that the Triple A Road is
12 already a county road. It's graded at least once a week.
13 That's what I observed when I worked up there through summer
14 months. And it receives road traffic including logging
15 trucks and recreational vehicles. And there will be maybe
16 increased traffic on the road, but there's no new road or
17 expanded road or paving of the road. So I wouldn't call
18 that a significant change with regard to wildlife impacts.

19 Q And so how would you classify the potential effect due to
20 road use?

21 A Minimal.

22 Q It's also been suggested that noise from the proposed mine
23 will have substantial effects on wildlife. Do you agree
24 with that?

25 A I do not agree with that, and the reason includes a variety

1 of methods that the application included to minimize impacts
2 from noise. And some examples, as I recollect, include
3 generators would have silencers on them. They would vent
4 into the tall stacks rather than just directly to the
5 atmosphere at, you know, surface level. That the berm I
6 think on average about 15 feet high that will surround the
7 facility would help minimize perceived sound away from the
8 footprint of the mine. The existing roads, using my laser
9 here to show this dark band of trees along the Triple A,
10 those are mature conifer stands on both sides of the road
11 here. And based on studies road impacts on wildlife and
12 most of which are based on paved highways or major roads
13 that receive 10,000 to 100,000 cars per day, it will just be
14 a fraction of that kind of traffic on this road even with
15 the mine. And those studies indicate that sound is
16 mitigated very well by mature conifer trees, and we have
17 that here along the Triple A Road; tall bands of Jack Pine,
18 white pine, red pine which will help mitigate perceived
19 sound, you know, in this case only 100 yards or 200 yards
20 off of the road in both directions. So I think that the
21 vegetation will help minimize that road noise in addition to
22 the other techniques they're going to use to minimize noise.

23 Q And so how would you characterize the effect of any
24 increased noise from traffic or noise in general from the
25 mine?

1 A Minimal.

2 Q There's also been a suggestion that night lighting may
3 effect wildlife. Do you agree with that?

4 A I disagree that night lighting will effect wildlife from
5 this project. They have plans to use direct lighting at
6 night where the focus of the beam would be down where the
7 illumination is needed rather than directing it skyward
8 which can be a problem for migrating birds. The towers
9 themselves for the emissions don't need to be lighted.
10 They're not tall enough to require lighting for air
11 navigation hazard concerns. They're going to use minimal
12 lighting based on what I read in the report generally to
13 keep the site subdued with regard to light. Given the lack
14 of urbanization here, I don't think, you know, for security
15 typically a big reason for night lighting, I don't think
16 they're going to be worried a lot about security here. So
17 they could probably get away with less than normal night
18 lighting array you would expect around an industrial
19 facility. So for those reasons, I think the perceived night
20 lighting away from the facility is going to be rather
21 subdued.

22 Q Now, there's been some suggestion that the -- that at least
23 the riverine area or the area within the study area around
24 the Salmon Trout River would provide a migration corridor or
25 flyaway for birds. Now, were you here for that testimony?

1 A I was.

2 Q And what is your opinion on that suggestion?

3 A Well, it hasn't been documented very well in the past or
4 currently. And based on my experience, no migration
5 corridors for birds are associated with large river systems
6 with large riparian corridors that make for easy visual
7 navigation. So I'm thinking the Mississippi River, the
8 Grand River here in Michigan, rivers like the Escanaba that
9 basically split the U.P. in two. Those kinds of large third
10 order, fourth order systems that have a significant presence
11 in the landscape would be more likely to be used as a
12 migration corridor. We do have the Salmon Trout here in the
13 Yellow Dog or in the headwater regions of both of those
14 rivers. They're not large streams in this area with the top
15 of the watershed, so I'd be less likely to suspect this is a
16 migration corridor because we're at the top of the watershed
17 rather than further down in it where the stream channel and
18 the riparian areas are more defined.

19 Q There's also been some testimony to suggest that the Yellow
20 Dog Plains or the study area here may be provide a heat
21 corridor for large mammals to travel to and from the
22 McCormick tract in the Huron Mountain Club. Do you recall
23 that testimony?

24 A I recall that discussion, yes.

25 Q And do you agree with that?

1 A No.

2 Q Is there any evidence that the study area acts as a regular
3 corridor for animals living either on the McCormick tract or
4 the Huron Mountain Club?

5 A I'm not aware of any.

6 Q Now, in connection with that same discussion, and I think
7 you were here to hear it because you talked to me afterwards
8 about it, one of the lawyers for Petitioners asked Dr.
9 Flaspohler whether he knew any bobcat trackers. And Dr.
10 Flaspohler said no. Do you remember that?

11 A I remember that.

12

13 Q Do you know any bobcat trackers?

14 A Well, I know people who hunt them and research them and
15 follow their footprints in the snow, yes, and I followed
16 bobcat tracks in the snow as well so I guess that makes me a
17 bobcat tracker. It's hard to find a full-time day job doing
18 that but --

19 Q Now, what impact will the mine have on areas located within
20 the Yellow Dog Plains outside the footprint?

21 A I'd characterize those as minimal impacts.

22 Q What impact will the proposed mine have on the McCormick
23 tract?

24 A None that I'm aware of.

25 Q Are you familiar with the Huron Mountain Club?

1 A I am.

2 Q And it's location?

3 A Yes.

4 Q What impact will the proposed mine have on the Huron
5 Mountain Club in your opinion?

6 A Well, none that I'm aware of.

7 Q Are you familiar with the Mulligan Plains?

8 A Yes.

9 Q And their location with respect to the proposed mine site?

10 A I am; yes.

11 Q What impact will the proposed mine have on the Mulligan
12 Plains?

13 A I'm not aware of any.

14 Q Dr. Lindsay for the Petitioners also testified that he
15 believed that there may be a loss of insectivore birds as a
16 result of the proposed mine. Do you recall that testimony?

17 A I do.

18 Q And he further believed that the loss of insectivores would
19 have an effect on trees or vegetation in the surrounding
20 area. Do you remember that?

21 A I do remember that discussion.

22 Q And do you agree with that?

23 A I found that testimony a little confusing. I don't agree
24 with it because the disturbance to build the mine will alter
25 the habitat within the footprint of the mine, of course, and

1 I think you'll see a tradeoff. Some insectivorous species
2 that might have been there like a flycatcher may move into
3 adjacent habitat. Another type of insectivore like a
4 nighthawk or a nightjar may be attracted to the night
5 lighting to feed on insects and take its place. So I think
6 it's difficult to make that kind of assessment and frankly I
7 don't think it would matter much given the small scale of
8 the project, given the large scale region we're examining
9 here, that what minor insectivorous change there might be
10 from our activities would be insignificant on the greater
11 scale.

12 Q There's also been some discussion and criticism that
13 Kennecott has not evaluated the cumulative impact of
14 multiple human stressors on wildlife in the environment.
15 Were you here for that testimony?

16 A I was here, yes.

17 Q And can you tell me about the state of the science with
18 respect to evaluating those types of cumulative impacts of
19 multiple stressors on wildlife?

20 MR. WALLACE: Again, just for the record, to be
21 very clear, I object to the opinions he's rendering.
22 There's no hint that he has expertise in these areas. He's
23 now claimed expertise in about 15 or 20 different areas from
24 avian biology to noise detection to light to -- and now he's
25 talking about cumulative impact of multiple human stressors.

1 There's not a hint in the record he's ever written anything
2 about it, researched it, studied it back when he was an
3 undergraduate and last studied wildlife biology. We're
4 getting way off track here.

5 Q Have you researched the cumulative impacts of multiple
6 stressors on wildlife?

7 A I have a done a literature review, yes.

8 Q And based upon that literature review, what have you found?

9 MR. WALLACE: I don't think this makes him an
10 expert. I'm just -- my objection for the record, your
11 Honor.

12 JUDGE PATTERSON: Okay. And, again, I'll reaffirm
13 my previous ruling earlier. I think he's sufficiently
14 qualified under the MRE. The limitations of his expertise
15 if there is can go to the weight of his testimony obviously.

16 A Well, based on my reading of the literature, evaluation of
17 multiple stressors on wildlife is a very difficult thing to
18 measure. Science as all it can do to measure even one
19 variable in a study. So adding two or three or four or
20 multiple tiers of variables really is a challenge to the
21 state of the art of existing scientific methods. And there
22 is no established protocol for evaluating multiple
23 stressors.

24 Q Now, in your experience with working with the DNR and also
25 your experience as a consultant, do you have experience with

1 evaluating multiple stressors?

2 A Well, working for the DNR, one of the charges of the
3 statutes under Wetlands Act, for example, was to look at
4 cumulative impacts in evaluating a particular project. And
5 so, yes, you have to consider it with every application.

6 Q And how is that done in your experience?

7 A Well, a good example and relevant to us would be -- if I can
8 draw a picture on the board here?

9 Q Sure.

10 (Witness draws diagram)

11 A All of the pieces make a whole, I guess. If I were to
12 explain this as basically as possible and maybe in the
13 middle here of this circle we've got Foth Environment and
14 Infrastructure on behalf of KEMC, and they're completing
15 this application to build the mine. To evaluate all of the
16 impacts, they've hired a variety of the specialists, people
17 like myself to look at wildlife matters, aquatic specialists
18 who would look at the stream and the potential impacts on
19 aquatic organisms. You would have the air quality people
20 out here looking at air emissions. You'd have the
21 hydrogeologists looking at general groundwater and toxic
22 issues. In fact, you could probably have another bubble
23 here of just toxicology in general across the whole spectrum
24 of air and water and surface impacts, economic and whatever.
25 All the other aspects that have been examined as part of

1 this project, all point toward Foth who is the coordinator
2 and filled out the application and submitted it based on all
3 the expertise circling it. I think in lieu of a scientific
4 method that doesn't exist yet, that's as good as it gets.
5 And that is what forms the basis for virtually every EIS or
6 EIA submitted, you know, for review.

7 Q In your experience both working for the DNR analyzing
8 environmental impact assessments and as a consultant
9 contributing to environmental impact assessments, is this
10 the standard way that cumulative impacts are analyzed?

11 A Yes, it is.

12 Q Now, looking again at the aerial photograph that we have of
13 the study area on the screen here, do you have an opinion on
14 Kennecott's decision to construct and operate a mine in the
15 proposed footprint with respect to minimizing impact on the
16 environment?

17 A I do. I've considered it. And as you look at where the
18 orebody is, the yellow blob, and you have to have your mind
19 somewhat in close proximity to it to extract it. And if you
20 look at the variety of habitats that surround it including
21 the riverine forested wetland system here and then the
22 adjacent upland habitats and then, if you want to go even
23 further to the north, we have the Mesick hardwoods of beech
24 and oak and red maple and sugar maple on sloped, loamy
25 soils. I think that the site they've chosen, which is cut

1 over Jack Pine and well drained soils on a flat spot not
2 subject to erosion, well isolated from water bodies is the
3 best spot in the area to put a mine.

4 Q Now, you already talked about silencers on stacks and other
5 things to minimize noise that are in the permit application
6 and required by the permit. And you talked about shielding
7 on night lighting and the lack of lighting on the stack to
8 minimize effects of light. Are there other things that
9 either Kennecott, through its mining application, or the
10 DEQ, through its permit requirements, have done to minimize
11 the effect on the environment?

12 A Well, in addition to the restoration plan, which I
13 discuss which will return the surface facility to a
14 native flora, there are long-term monitoring provisions in
15 the permit including, if I recollect, you have to monitor
16 for wildlife species for the life of the mine and then, once
17 the mine is closed and restored, they have to do an
18 additional five years of monitoring for ecological concerns.

19 Q And how about dust that may be caused from increased
20 traffic?

21 A There is a fugitive dust plan. I didn't study it. But I
22 recollect that it includes watering roads in the summer
23 months to minimize dust from vehicular traffic, washing down
24 of equipment and trucks that are going to hit the road with
25 a load of ore to help keep the ore dust on the site and off

1 of the public road system. Those are a couple of the
2 methods I recollect.

3 Q Now, you said that you're aware that the Triple A Road is
4 currently graded once a week?

5 A Yes.

6 Q Are you aware of any watering that's going on currently?

7 A Only when it rains.

8 Q Now, will the effects on wildlife and the environment, in
9 your opinion, be temporary or lasting?

10 A Well, it will be temporary. Because of the life of the mine
11 is short, less than 20 years for everything, as I recall, so
12 and they're going to remove all the infrastructure
13 associated with it. So there will be very little or no
14 evidence of it at surface level once it's restored.

15 Q Mr. Kailing, we've gone over these before. I just --
16 because now we've provided the basis, I believe, for your
17 conclusions. If we could put slide 4 back up on the screen?
18 And if you could again just quickly go through your
19 conclusions with respect to surveys that were conducted?

20 A Three are conclusions. One based on three years of surveys
21 in the study area, the wildlife species identified will
22 predominantly -- common species, typical as expected to be
23 found in the habitats present.

24 Q Now, when you say "common," you mean common in Michigan?

25 A Yes. Common in the U.P. and common in Michigan, common in

1 the Great Lakes region. Two, the only threatened and
2 endangered species identified in the study area were the
3 bald eagle, merlin, osprey and grey wolf, all classified as
4 threatened species. The study area does not contain
5 critical habitat for any of these four. And finally all
6 evidence from the surveys indicates these four threatened
7 species were barely transients across the study area.

8 Q And the DNR is in the process of de-listing three of those?

9 A That's true; the osprey, the grey wolf, the bald eagle.

10 Q And have you provided the basis for your opinions that you
11 just read with respect to the survey?

12 A Yes.

13 Q Again go over quickly your conclusions about the impacts of
14 the proposed mine.

15 A Five major points. One, the impacts on wildlife from
16 construction and operation of the mine will be effectively
17 limited to the footprint of the mining facility. Any
18 impacts outside the footprint will be minimal.

19 Q Now, when you talk about effects outside of the footprint
20 being minimal, what effects are you talking about?

21 A Night lighting, noise, dust. Two, no threatened or
22 endangered wildlife species were identified within the
23 footprint of the proposed mine. Three, habitats within the
24 footprint are very common and do not provide critical
25 habitat for any T&E species, threatened and endangered

1 species, known to occur in Marquette County. Four, the
2 common wildlife species identified within the study area
3 will relocate to adjacent similar habitats. And five, any
4 impacts to wildlife will be temporary as the footprint will
5 be returned to a native flora and wildlife species will
6 reoccupy the site.

7 MR. PREDKO: Thank you, Mr. Kailing. And before I
8 pass the witness, I just have a few housekeeping exhibit
9 issues, your Honor. I would offer into evidence the five
10 demonstrative slides as Intervenor 646.

11 MR. REICHEL: No objection.

12 MR. WALLACE: We object, your Honor. We don't
13 think there was a foundation for this gentleman's expertise
14 or work performed to render any of these opinions.

15 MS. HALLEY: We join in that objection.

16 MR. EGGAN: I would add the objection that I've
17 had on the record with other exhibits. I would only note
18 that really these are just conclusions. There is no
19 foundation either in the slides or frankly elsewhere for the
20 conclusions that were reached. So that would be the
21 objection I would offer.

22 MR. PREDKO: And they're just for demonstrative
23 purposes, your Honor.

24 JUDGE PATTERSON: I'm going to make the ruling I
25 did before on other witnesses. I'm going to admit it for

1 demonstrative purposes.

2 (Intervenor's Exhibit 646 received)

3 MR. PREDKO: And I would also offer into evidence
4 the 2004 wildlife and threatened and endangered species
5 surveys. And for the record, those are in Intervenor 12
6 Bates stamped KEMC 109067 through 109164. And then the
7 threatened and endangered report is KEMC 109168 through
8 109248.

9 MR. EGGAN: What exhibit number was that?

10 MR. PREDKO: Intervenor 12.

11 MR. WALLACE: And we would object to that.
12 There's been no foundation laid at all that this gentleman
13 had anything to do with the preparation or oversight of the
14 studies unless I've misunderstood something.

15 JUDGE PATTERSON: I believe he did testify to
16 that. That's my recollection.

17 MR. PREDKO: Mr. Wallace is correct about the 2004
18 study, your Honor. And I think I can provide a foundation
19 for its admittance into evidence.

20 JUDGE PATTERSON: Okay. Go ahead.

21 Q Mr. Kailing, the 2004 study, who was that conducted by?

22 A That was conducted by Wetland and Coastal Resources.

23 Q Okay. And in doing your surveys, your studies of the area,
24 and preparing the protocol for those studies, did you rely
25 on the 2004 study?

1 A Yes, I did, on the contents and the appendices and the
2 photographs.

3 Q And have you relied on the 2004 study to form your
4 conclusions in this case?

5 A Yes.

6 Q Is that kind of report, the wildlife assessment and
7 threatened and endangered species survey, within your area
8 of expertise?

9 A Yes, it is.

10 Q Are those reports commonly relied on by you and others in
11 your field?

12 A Yes.

13 MR. PREDKO: Again I would offer the report into
14 evidence and also in response to the objection state that I
15 believe that it is proper for this report to come in,
16 although he didn't prepare it, he relied on it. And in
17 accordance with APA, Section 75, the Agency may admit and
18 give probative effect to evidence of the type commonly
19 relied on -- upon by reasonably prudent men in the conduct
20 of their affairs. And this is clearly within his expertise.
21 It's related to the project. He clearly relied on it both
22 to do his own surveys and to form his conclusions here.

23 MR. WALLACE: Well, I mean, we're going to create
24 a whole new category of acceptability here if we take this
25 step. This gentleman -- the fact that he relied on a

1 report, the foundation of which he knows nothing about, only
2 undermines his testimony. It doesn't enhance the
3 admissibility of the proposed exhibit. He doesn't know who
4 conducted this or how it was conducted or -- nor do we,
5 because no foundation has been laid. He knows none of the
6 methodology underlying this. He didn't oversee it. He
7 didn't design it. He has no connection to this whatsoever
8 except he's read it. And that's enough to get it admitted.

9 MR. PREDKO: Well, that's not true, your Honor.
10 He has testified he knows the methodology. He does know who
11 conducted the survey. And I would just remind the court
12 that this is not creating a new category of admissible
13 evidence that just recently in Dr. Stuart Miller's, one of
14 Kennecott's witnesses, this court admitted upon Petitioner's
15 request a report that was drafted by Ann Maest, one of their
16 experts, on the basis that Stuart Miller had reviewed it and
17 relied on it.

18 MR. WALLACE: Well, that's a pretty different
19 thing. Ann Maest came here and testified live and was
20 subject to cross-examination for hours. We're talking about
21 a report created by individuals whom we don't even know who
22 aren't here, who apparently will never be here, who never
23 can be examined on what they did or how reliable it was.
24 This is just the wrong witness for this exhibit. Presumably
25 these people are still alive and could testify or could have

1 been named as witnesses. But this is just -- and we have
2 abundant exhibits we've offered where we've had the
3 witnesses present. And this is -- I think this is just
4 beyond the pale. There's no foundation under any Rule of
5 Evidence for it.

6 MR. PREDKO: Your Honor, it's no different and I
7 would just say that that Ann Maest report that did come in
8 contained not only Ms. Maest's report but others' reports
9 that have not testified. And that's why it didn't come in
10 through Ann Maest. And it did come in because one of our
11 experts said he relied on it. Mr. Kailing has not only said
12 that he relied on it to conduct his own surveys, but that
13 this is what he does -- this is his expertise.

14 MR. WALLACE: That example is just the opposite of
15 what I'm saying. That Mr. Kailing relied on it doesn't make
16 it admissible. If our witnesses came in and relied on it,
17 you'd have a good case. But they haven't claimed that.
18 It's just --

19 JUDGE PATTERSON: All right. His -- Mr. Kailing's
20 report is in evidence?

21 MR. PREDKO: I'm about to offer those, too.

22 JUDGE PATTERSON: Okay.

23 MR. PREDKO: The 2004 report was part of the
24 environmental impact assessment that's part of the mine
25 application, which I'm having trouble understanding how it's

1 stipulated to, because Petitioners stipulated to it and then
2 withdrew the stipulation. But apparently it's in for the
3 purpose of would have had that the DEQ reviewed it. And now
4 I'm admitting it --

5 JUDGE PATTERSON: I'm going to overrule the
6 objection and admit it under Section 75 of the APA.

7 (Intervenor's Exhibit 12 received)

8 MR. PREDKO: I would also offer into evidence
9 Intervenor Exhibit 161, which is Mr. Kailing's 2007 wildlife
10 and threatened and endangered species report.

11 MR. WALLACE: And I object, your Honor, on the
12 basis that this is not part of the permit record. It was
13 made after the -- it was apparently undertaken after the
14 permit was -- application -- it was long after it was filed.
15 And it shouldn't be part of this record.

16 JUDGE PATTERSON: Again, I'll overrule that. But
17 the case is a de novo review, entitlement to the permit.

18 (Intervenor's Exhibit 161 received)

19 MR. PREDKO: And I would offer Intervenor Exhibit
20 160, which is Mr. Kailing's 2006 wildlife and threatened and
21 endangered species survey. And -- yes. That's it.

22 MR. WALLACE: Same objection.

23 JUDGE PATTERSON: Same objection? Same ruling.

24 (Intervenor's Exhibit 160 received)

25 MR. PREDKO: I would also offer Intervenor 25,

1 which is Mr. Kailing's 2006 Kirtland's warbler report.

2 MR. REICHEL: No objection.

3 MR. WALLACE: And same objection, your Honor.

4 JUDGE PATTERSON: All right. That being that it
5 was generated after the application process?

6 MR. WALLACE: That it was generated after --

7 JUDGE PATTERSON: Right. I want to make sure of
8 that. I'll make the same ruling I did before in regards to
9 that.

10 (Intervenor's Exhibit 25 received)

11 MR. PREDKO: That's it. I pass the witness, your
12 Honor.

13 MR. REICHEL: We have no questions at this time,
14 Judge.

15 MR. WALLACE: Mr. Kailing, my name is Bruce
16 Wallace. I represent Huron Mountain Club. I have a few
17 questions.

18 CROSS-EXAMINATION

19 BY MR. WALLACE:

20 Q Let me understand, if you would, precisely what scientific
21 areas you consider yourself an expert in.

22 A I consider myself a wildlife biologist/field ecologist. I
23 know a little bit about a lot of disciplines relating to
24 wildlife species, bird species, amphibians and reptiles.

25 Q Okay. You're not an avian biologist?

1 A I am not a academic avian biologist, no.

2 Q You're not an academic ornithologist?

3 A No. I'm a field ornithologist.

4 Q You're not an expert in mining in any sense?

5 A No.

6 Q Are you an expert in generation and propagation of sound?

7 A Only when my four kids misbehave bought otherwise, no.

8 Q Okay. You share that expertise with a lot of other people.

9 Are you an expert in light?

10 A I am knowledgeable about night light effects on wildlife in

11 what I have studied.

12 Q You were with King and McGregor; is that correct?

13 A Correct.

14 Q Okay. And why did you leave there?

15 A I had an opportunity to lead ecological services branch with

16 Fishbeck.

17 Q And when did you join Fishbeck?

18 A November of last year.

19 Q When did you begin working for Kennecott?

20 A I think it was early 2006.

21 Q And what were you asked to do and by whom?

22 A Well, my supervisor asked me to head up the field

23 investigation and baseline ecological studies for the mining

24 project.

25 Q Who was that?

1 A The individual's name?

2 Q Somebody that's king at McGregor?

3 A Matt McGregor, the vice president.

4 Q And who was your contact at Kennecott when you began the
5 project?

6 A We work through Foth Environment and Infrastructure.

7 Q Who at Foth?

8 A Sometimes Steve Donohue, other times Andrea Martin.

9 Q And what were you told was the purpose of the project you
10 were going to head up?

11 A Well, the purpose was to conduct baseline ecological studies
12 presumably to be used as an application for permit.

13 Q And were you given the guidelines for the application? Did
14 you know what components the report had to contain?

15 A Yes.

16 Q And what main features do you remember about those
17 requirements?

18 A The statute required an assessment of flora and fauna.

19 Q And it required an assessment of flora and fauna over a
20 period of 24 months; is that correct, sir?

21 A I think it said something like two years in the statute.

22 Q When you undertook this assignment, did you know that a
23 prior assessment had been done?

24 A Not initially, no.

25 Q When was that first brought to your attention?

1 A At some point in the planning stage when we started talking
2 about a work plan and what exactly we'd be doing. And it
3 was brought to our attention that a previous survey had been
4 completed.

5 Q And that previous survey is the 2004 survey we've just been
6 talking about; correct?

7 A Correct.

8 Q And that's the only survey that was submitted with the
9 mining permit application; correct?

10 A I believe that's correct.

11 Q When it was brought to your attention there was a previous
12 survey, were you told what the shortcomings of that survey
13 were?

14 A We were given a copy of it to review.

15 MR. PREDKO: Objection. That's a -- objection.
16 That's a compound question.

17 A Nobody said anything about shortcomings. But we were given
18 a copy of the report and its contents to review including
19 the appendix materials and everything within in.

20 Q Were you told why they were switching companies?

21 A No.

22 Q When you reviewed it yourself, did you note any
23 shortcomings? I'm referring to the 2004 survey.

24 A Shortcomings in reference to?

25 Q Well, compliance with the statute, compliance with the

1 standards of your various areas of expertise.

2 A No.

3 Q Did you notice it did not cover 12 months?

4 MR. PREDKO: Objection. Mischaracterizes the
5 document.

6 Q How many months did it cover, sir?

7 A Well, the field work was conducted in the spring. Flora
8 surveys, spring migration surveys, breeding bird surveys,
9 summer flora surveys, fall breeding bird survey. So if I
10 had to add it all up, I guess they were out there May, June,
11 July, August. I know they delineated a lot of wetlands.
12 September. I would speculate here, because I don't have the
13 report in front of me. Probably the entire growing season;
14 maybe eight months, something like that.

15 Q And that's roughly the same period you covered in the two
16 studies you did; correct?

17 A Yes.

18 Q Were you out there as early as May or did you start in June
19 actually?

20 A We did some -- I think we did some botanical work in May.

21 Q And I could be incorrect about this. But the latest date
22 that I've seen for field work in those studies was the
23 September fall breeding bird date?

24 A Yeah. That would be correct, late September.

25 Q So May to September?

1 A Yes.

2 Q And you commented earlier that you're a bobcat tracker and
3 pointed out that you track them in the snow; correct?

4 A Correct.

5 Q Okay. There are a lot of animals that -- and certainly
6 bobcat that's one of them -- that are easier to track in the
7 snow; correct?

8 A That's right.

9 Q There are also animals that inhabit the Yellow Dog Plains in
10 the winter but not in the summer; correct?

11 A Possibly.

12 Q You're aware of the fact that the Great Gray Owl, for
13 example, indications have been found in the study area?

14 A Well, the remains of one were found. But I don't think we
15 know the month of its demise or what activities it was
16 participating in when it was killed or died.

17 Q Well, what do you think as a part-time ornithologist is the
18 most likely time the Great Gray Owl was in the Yellow Dog
19 Plains?

20 A Probably in the winter months. That area is generally
21 devoid of mobile wildlife in the winter months due to the
22 severe snow depth and lack of winter cover.

23 Q How many times have you been there between November and
24 April over the years?

25 A I've never been there between those months.

1 Q And presumably nobody else that you know of has been in that
2 area between those months to conduct studies of animal life;
3 correct?

4 A Well, no. I have friends who snowmobile up the Triple A
5 Road in the winter months and --

6 Q Excuse me; excuse me. My question was, are you aware of
7 anybody who has been there to conduct animal studies in the
8 winter months?

9 A Yes. Brian Roell, the DNR wolf biologist out Marquette,
10 does a winter track survey, he and his staff. And they go
11 up the Triple A Road or the road just north of it to do
12 winter track surveys. And he's told me about driving miles
13 in this area in the winter months and seeing no tracks of
14 fur bearers.

15 Q I'm really not asking you to report what other people have
16 said to you, because that's hearsay.

17 MR. WALLACE: And I do move to strike it.

18 MR. PREDKO: I'd just object. That was your
19 question, Counsel.

20 A Well, you asked if I knew people who did it.

21 Q Yeah. That's what I asked.

22 A And I --

23 Q In any event, the cat is out of the bag. He was there.
24 He's a wolf expert; correct?

25 A Yes. That's a specialist.

1 Q He is a preeminent wolf expert. You're not a wolf expert,
2 are you?

3 A I'm not a wolf expert, no.

4 Q And when you look at wolf tracks in the study area, you
5 really can't tell us what that wolf is doing or where it's
6 going or how fast it's moving, can you, sir?

7 A You can infer quite a bit from the tracks if you're
8 experienced at identifying that kind of signing.

9 Q Maybe Brian Roell could do that?

10 A Yes.

11 Q You don't know if the wolf tracks -- and wolf are a
12 threatened species; correct?

13 A That's correct.

14 Q And you found evidence of wolf in the study area; correct?

15 A Correct.

16 Q Threatened species. And what you found were the tracks of
17 the wolf moving right along or something like that?

18 A Sure; yes. Yeah.

19 Q But you don't know how long that wolf had been there or what
20 other wolves might have been there, do you?

21 A Well, based on the evidence -- I didn't find old wolf
22 tracks, for example, or wolf kills or scat that was decayed
23 or evidence of chewed bones or any of that sort of evidence.
24 I just found a set of fresh wolf prints.

25 Q Do you know where the various packs den -- the U.P. wolf

1 packs den in the fall and winter?

2 A Well, I know what Brian Roell described to me about that
3 matter.

4 Q Okay. Do you know firsthand where they den, sir?

5 A No.

6 Q Would you expect to find martin or fisher in the Yellow Dog
7 Plains area?

8 A You might find them associated with the more mature timbered
9 areas. You would not expect them out in the Jack Pine
10 habitats. Both of those are more of a deep forest species.

11 Q In connection with your studies, how many times did you go
12 out to the study area?

13 A For each season, probably up to two weeks -- probably ten
14 days.

15 Q Ten days total?

16 A Ten to twelve days per year.

17 Q It looked like -- and correct me if I'm wrong. It looked
18 like the bird studies were conducted in two three-day stints
19 in the spring, in June and then in September?

20 A Yeah; that's right.

21 Q Is that right?

22 A Yeah; yeah.

23 Q So six days total on the bird studies?

24 A Yeah. But then there's time to reestablish the points, to
25 find them from the last winters. And frequently vandals

1 might remove the flagging or break the stakes off, so you
2 have to go and reorient yourself, reestablish those points,
3 make sure you can get into the area.

4 Q So that's why you got the ten days total?

5 A Yeah; right. Then you're doing frog and toad surveys at
6 dusk, and then you've got time between one study and
7 another. So you're still out there.

8 Q Well, when you were out there, how many people were working?

9 A Depending on the deployment, a team of four up to nine or
10 ten.

11 Q And who determined the boundaries of the study area?

12 A I believe it was Foth in conjunction with Kennecott.

13 Q Okay. The so-called study area I'm referring to is the 1360
14 acres?

15 A Uh-huh (affirmative).

16 Q Is that a "yes"?

17 A Yes.

18 Q And the boundaries of the study area that you studies were
19 identical to the boundaries of the study area studied in
20 2004, were they not?

21 A They were pretty close, as I recollect.

22 Q And these boundaries that are established, I gather, on some
23 notion of what area is going to be affected by the mine; is
24 that right? Ecologically?

25 A I'm not sure about that. It could be based on land

1 ownership, the fact that it's squared off so nicely.

2 Q Well, that's what I was wondering. Is it -- the boundaries
3 are all north/south and east/west lines; correct?

4 A Yes, they are.

5 Q So would you agree that it's not likely that the boundaries
6 of the study area were established based on any scientific
7 grounds?

8 A I don't know.

9 Q Who do you think would know who determined the so-called
10 affected area for the purpose of these studies? Somebody at
11 Foth?

12 A That's who I would pick, yes.

13 Q And you don't know what methodology went into that?

14 A I don't, no.

15 Q Just outside that study area are some pretty substantial
16 areas of standing timber; correct?

17 A Yes.

18 Q Some of them larger than any of the standing timber acreage
19 within the study area, wouldn't you say?

20 A Yes.

21 Q I guess one of the things I'm wondering, you know from
22 hearing Dr. Lindsay's testimony that a study was conducted
23 in 2004 under his direction; correct?

24 A The bird -- avian study?

25 Q Yes.

1 A Yes.

2 Q And that study identified in the June period 94 different
3 species. Do you recall that?

4 A I think it was something like that. That sounds reasonable.

5 Q Roughly twice as many species as you and your team found?

6 A Yes.

7 Q And do you have an explanation for that?

8 A We studied an area approximately two square miles with an
9 emphasis on the proposed impact area and the footprint and
10 the surrounding area, which really isn't that diverse. As I
11 described earlier, two kinds of Jack Pine stands in the
12 direct footprint area. And surrounding it you have Jack
13 Pine in various stages of regeneration and some nice
14 diversity associated with the Salmon Trout. But, for
15 example, totally lacking in our study area would be the
16 Mesick upland hardwoods, the mature beech, maple. And their
17 study area was nine square miles, you know, four times
18 larger than ours. So that would account for some of the
19 variability. I frankly was surprised to find as many
20 species as we did given the relatively stark habitats there
21 in our study area.

22 Q I mean, 48 species is a pretty rich species count for a
23 two-square-mile area, isn't it?

24 A On a statewide basis, that's decent, yeah.

25 Q But in any event, by looking at a slightly larger area, the

1 avian study conducted under the direction of Dr. Lindsay
2 picked up twice as many birds. And you're saying probably
3 because it brought into play additional rich species
4 habitat; correct?

5 A Correct.

6 MR. PREDKO: Counsel, for the record, which avian
7 study are you talking about? It's my understanding that
8 there were two.

9 MR. WALLACE: There was a fall and -- June and a
10 fall study.

11 MR. PREDKO: Yes.

12 MR. WALLACE: The 94 species is the June study.

13 MR. PREDKO: Thank you.

14 Q And then in the fall, Dr. Lindsay had another study
15 undertaken. And that identified 118 species. Do you recall
16 that?

17 A Uh-huh; yes.

18 Q Okay. And how does that compare with the number of species
19 your team found in the fall?

20 A We had again, I think, maybe 40-some or 52, something like
21 that, right in that range.

22 Q Now, did your -- did your studies miss the spruce grouse,
23 for example?

24 A No. We detected the spruce grouse.

25 Q Did you see the spruce grouse?

1 A Yes. I saw it myself.

2 Q You saw it yourself?

3 A Yes.

4 Q Okay. And there are species a special concern; correct?

5 A They are.

6 Q Okay. And tell us again what that means about the spruce
7 grouse.

8 A That they -- a species of concern means that the species is
9 afforded no protection under the Native Species Act but its
10 population could be in decline across its range or its
11 population status is unknown.

12 Q And it's a species of special vulnerability to human beings,
13 is it not?

14 A It is, yes.

15 Q That's because, for whatever reason --

16 A It lacks fear of humans.

17 Q It lacks fear of humans.

18 A They're readily approachable. The other thing I would like
19 to comment on regarding the perceived discrepancy between
20 their survey and ours is that, not only did they cover nine
21 square miles, but they made a point of going to, I think
22 they said, unusual or interesting or novel habitats,
23 something to that effect.

24 Q Okay.

25 A Whereas we were limited to our study area. And we can't

1 help determine what kind of habitats were there.

2 Q Well, let me just come at this from a slightly different
3 angle. You were limited to your study area. That was none
4 of your doing. This study area excluded a number of rich
5 habitats. Did you ever have a conversation with anybody
6 about perhaps the value of looking slightly beyond these
7 fixed boundaries to see what else of importance might be
8 there to consider in terms of mine impact?

9 A No. Because the footprint of the mine -- I think the basic
10 disturbance area is 92 acres. And I think that including
11 the fencing and the berm and the access driveways are like
12 145 acres. When I look at a 145-acre site relative to 27
13 square miles of the Yellow Dog Plains, that's not much of an
14 impact. It's not like a regional airport with two or three
15 square miles or a landfill with a square mile. It just
16 doesn't have a level of permanent disturbance like this
17 project does.

18 Q Well, when did you reach your opinion that the impact on the
19 1360 acres would be minimal?

20 A After we collected our two seasons' worth of data, after
21 reading the mine application and supporting materials, after
22 reading the popular press about mining -- sulfide mining --

23 Q I was really asking a when question.

24 A Oh, when? Well, after I did all of that. So, you know --

25 Q Okay. Because it seems --

1 A 2008. How is that?

2 Q Because it seems to me that this was done entirely
3 backwards, that a study was -- that an area was determined
4 in advance for study and then later after doing all the
5 things that you did, which are important to do, you were
6 able to say what the impact was as opposed to an impact
7 study that would begin with a notion of let's look at where
8 all the impacts and decide how big this area is. I would
9 think the decision as to the size of the area would come
10 last, not first. Do you have any idea what the thinking was
11 about that?

12 A I guess I'm not following you.

13 Q We have a statutory defined term here "affected area."
14 Okay. And it's the affected area that's required to be
15 studies. All right?

16 A Got you. Yes.

17 Q Okay. And an affected area is the area affected outside of
18 the mining area but in which the natural resources will be
19 affected. Okay?

20 A That's in the statute?

21 Q Yes.

22 A Okay.

23 Q Maybe it's in the regulations.

24 MR. PREDKO: I'll just object to the extent that I
25 believe mischaracterizing the statute which obviously the

1 court takes judicial notice of and object to the extent that
2 you're asking the witness to comment on legal issues.

3 MR. WALLACE: Actually I'm not asking him to
4 comment. Because I was trying to orient him to the
5 question, which he didn't understand.

6 Q And the question is, in order to determine what the affected
7 area is to be impacted by this mining operation, doesn't
8 that require a scientific study of the nature that you
9 conducted?

10 A Well, I guess what comes first? The chicken or the egg?
11 You know, in this case, they had a facility. They knew
12 where the orebody was. And that is going to determine
13 everything, I think. I'm no engineer or planner. But, you
14 know, commonsense would dictate there's the ore we have to
15 get. Where do we develop a facility that will allow us to
16 do that? And so they came up, you know -- I don't know when
17 they chose this surface facility. Okay. We conducted our
18 survey in a predetermined study area and gave our results.
19 And the application indicates that they looked at all the
20 information provided from the various experts. And I
21 testified earlier that I think they picked a great spot for
22 it relative to the other habitats in the area. You know, so
23 short of building it on exposed bedrock, I can't imagine a
24 more benign landscape to put it. Then I think -- well, what
25 does that mean for the rest of that region? That would be a

1 typical approach in my experience.

2 Q Well, in any event, bottom line is you don't know why you
3 were restricted to 1360 acres? Nobody told you?

4 A That's correct.

5 Q Did you see any common loons?

6 A No, I don't think that was in our list.

7 Q You know that's a threatened species; right?

8 A I'm aware of that, yes.

9 Q And you know that they were identified in the -- in Dr. Alee
10 Lindsay's study; correct?

11 A Uh-huh (affirmative).

12 Q "Yes"?

13 A Yes.

14 Q The northern harrier -- did you see any northern harriers?
15 I think we had one -- one identified.

16 Q That's a species of special concern?

17 A Yes, it is; yes.

18 Q And you know -- and the merlin is a threatened species;
19 right?

20 A Correct.

21 Q Okay. And you know that in Dr. Lindsay's study they
22 identified a pair that they believed to be a breeding pair
23 interest he Yellow Dog Plains; correct?

24 A I remember reading that, yes.

25 Q And in your study, you saw only one merlin; is that right?

1 A Right.

2 Q Okay. And because in those -- do you know whether you saw
3 that merlin in the spring or fall?

4 A I think it was fall, September.

5 Q Okay. So you concluded based on that that there weren't any
6 breeding merlins?

7 A Correct.

8 Q I mean, there is habitat in the area where merlins can be;
9 correct?

10 A It's possible; yes.

11 Q And would you disagree with the conclusion of Dr. Lindsay
12 that there was a breeding pair of merlins in the area?

13 A Well, you know, that's a little tricky to answer. Because I
14 don't know really where they did their bird surveys.

15 Q You don't know where?

16 A Yeah. I mean, they describe a nine-square-mile area and
17 they talk about this area, this area, as opposed to a point
18 on a map. I didn't see that.

19 Q Did you find blackback woodpeckers in your study?

20 A No.

21 Q And they're a species of special concern; correct?

22 A Yes.

23 Q And they were identified in the Lindsay study? Do you
24 recall?

25 A I don't recall that.

1 Q Now, some of these birds have extensive territories;
2 correct?

3 A That's correct.

4 Q I mean, a piliated -- you saw piliated woodpeckers; correct?

5 A Yes.

6 Q Okay. Piliated woodpeckers have territories of, you know, a
7 couple square miles?

8 A Sure, or more.

9 Q Or more?

10 A Uh-huh (affirmative).

11 Q Actually did you see a piliated woodpecker or did you just
12 hear it?

13 A I don't -- you know, I'd have to look at our record.

14 Q They're very distinctive; right? We'd be hearing him right
15 through the woods?

16 A A very distinctive call. Yeah; yes. There's no missing
17 them. I've seen them frequently in the U.P. on other
18 projects and going and coming to this site. And I'm pretty
19 sure we saw or heard them on our site. They're on our list.

20 Q Okay. In any event, there's a pretty good chance that the
21 piliated that you saw or the piliateds that you saw have a
22 territory well beyond the study area; correct?

23 A Yes.

24 Q Okay. And surely you would think the same as the eagle?
25 The eagle, you don't believe, was nesting in the study area;

1 correct?

2 A Correct.

3 Q So its territory will be maybe many square miles as is true
4 for eagles generally?

5 A Yes; yes.

6 Q Okay. Are you a fisherman, sir?

7 A I am.

8 Q Are you by any chance familiar with an eagle's nest near the
9 shore of the Ausable River? Do you know what I'm talking
10 about? Do you fish the Ausable?

11 A No, I don't.

12 Q Oh, you don't. Okay. I mean, eagles do nest along rivers
13 as well as larger bodies of water; correct?

14 A That's true.

15 Q So the Salmon Trout and the Yellow Dog wouldn't be excluded
16 as eagle nesting habitat, would they?

17 A I would consider them marginal. You know, a mature eagle
18 has got a 7-foot wingspan. So they need a water body where
19 they can negotiate down, grab the fish and take off without
20 running into trees or dead limbs. And given the twisted
21 nature and the narrow channel of a lot of that system, I
22 wouldn't call that preferred eagle nesting habitat. It's
23 possible.

24 Q I mean, we saw photographs of an eagle's nest on the Salmon
25 Trout River; correct?

1 A We did. But I think that was far downstream from our site.

2 Q It was downstream at the mouth?

3 A Yeah; yeah.

4 Q You wouldn't doubt that that eagle nesting there included

5 the Yellow Dog Plains in its territory, though?

6 A It would depend on the wealth of abundance of food in its

7 immediate nesting area. If eagles have an abundant food

8 source close to where they nest and fledge and have good

9 perch sites and heavy cover for getting out of the rain and

10 night roosting, they don't have to go real far. If food is

11 hard to come by and they have to travel further to find it,

12 then it's possible.

13 Q I think you testified that you have learned through the DNR

14 the locations of eagles' nests in the region?

15 A They gave me a general indication that there weren't any

16 within about six mile radius of the study area.

17 Q And where was the nearest one?

18 A They didn't say.

19 Q So you don't know if it was the one at the Huron Mountain

20 Club on the Salmon Trout or some other one?

21 A It's a lot more than six miles away. So it's probably -- I

22 don't know.

23 Q And the range of the osprey, is that also many miles?

24 A Yes.

25 Q Do eagles migrate south dependent upon the availability of

1 open water?

2 A They do typically. Although they're abducting in the Great
3 Lakes region to eating acarian, mainly road kill deer in
4 winter months.

5 Q So in the winter months, you're more likely to find eagles
6 near rapidly moving rivers than frozen over -- you don't
7 find them on frozen over bodies of water typically; right?

8 A Not typically unless there's an available food source.

9 Q So they tend to shift their focus towards the rivers in the
10 wintertime?

11 A Rivers or power plant discharge, warm water discharge if
12 there's open water. Uh-huh; yes.

13 Q Let me switch to another topic for a minute. How did you
14 determine what animals to survey for the animal survey?

15 A Well, we looked at the kinds of habitat and we looked at the
16 literature about mammals in Michigan including Curtis book
17 and did our homework basically on what mammals you'd expect
18 to find in those habitats. Based on prior experiences
19 personally and professionally, I could write you a list of
20 most mammals that you'd find if you just name a kind of a
21 habitat. For example, you know, beech/maple forest, what
22 would you expect there? And through scientific studies it's
23 known what species prefer what kinds of habitat. So
24 basically with experience you've kind of got a good idea
25 going in, and you can do your background research to help

1 clarify and cover anything you might be missing.

2 Q Okay. I was trying to follow your thinking about the wolf.

3 I take you, at least your view was that -- the wolf tracks

4 that you saw were of a wolf that was using the Yellow Dog

5 Plains as a corridor. That's what you opined as opposed to

6 an area for its pack; correct?

7 A I don't know if I would typify any kind of summer wolf

8 movement as a corridor. Their movements are pretty

9 scattered, random.

10 Q But it could have been a corridor? It could have been a

11 regular --

12 A It's possible. They do like to use manmade roads and trails

13 to cover the landscape because it's more efficient walking.

14 Q Have you had access to or conducted any sort of vehicle

15 counts on the Triple A Road or the nearby roads?

16 A As in a formal vehicle like a traffic count? Is that what

17 you mean?

18 Q Right, traffic count.

19 A No. My experience has been anecdotal, just working there.

20 Q That's what it sounded like. And just working there did you

21 see fishermen and berry pickers?

22 A Yes.

23 Q Let me ask you this. From listening to your testimony, I

24 thought I was hearing a description of like Grand Central

25 Station. And wouldn't you admit to the court that you go

1 out in the Yellow Dog Plains. It is a very empty remote
2 feeling area? Isn't that a fair statement, sir?

3 A That's not a bad statement. You know, some days we would
4 see two or three vehicles. Because most of our sampling
5 points were within hearing distance, at least, of a road.
6 And other days you might have 20 or 30 vehicles going by --

7 Q All day?

8 A Yeah, yeah, yeah. Squadrons of four-wheelers, the same --

9 Q Squadrons?

10 A Yeah; yeah. We had retirees who have these four-wheeler
11 clubs. And they traverse the U.P. -- go from L'Anse to Big
12 Bay on a four-wheeler like they do in the summer months.

13 Q Okay. Compared to that and compared to the -- you know,
14 can't we say relatively few people you saw out there?

15 A Yes.

16 Q How many ore trucks are going to be going in and out every
17 day in this mine?

18 A The number I recollect is 40.

19 Q 40.

20 A Does that sound about right?

21 Q Yeah. That's the number that I recollect.

22 A 40 a day.

23 Q And how heavy are these ore trucks? How big are they?

24 A I think, as I recollect, they're about the size of a
25 tractor-trailer rig, you know, kind of a standard

1 18-wheeler. They're not a particularly large or extra-large
2 truck. It has to run on public roads.

3 Q From your review of the application, you know that they're
4 not the only vehicles required to support this mine site;
5 correct?

6 A Correct.

7 Q What are some of the vehicles that they require? What has
8 to be brought in and taken out?

9 A Well, workers. But I think they talked about a bus or
10 commuting or some sort of mass transit for that -- and
11 support, you know, of food or water or maintenance, those
12 kinds of things.

13 Q Fuel? Aren't they running on generators?

14 A Yeah, fuel.

15 Q So they're going to need fuel trucks, all the support supply
16 kinds of vehicles for an operation that has a bunch of
17 people working there. They're going to haul in -- did you
18 know this? -- hundreds of thousands of tons of aggregate?

19 A To mix as part of the backfill operation?

20 Q Yeah.

21 A I didn't know that they were going to haul that or find it
22 locally. I've not -- I wasn't clear on that.

23 Q There's no aggregate mine site that you saw in the Yellow
24 Dog Plains, is there?

25 A I didn't see any.

1 Q Okay. Well, assume with me for a moment they're going to
2 haul in several hundred thousand tons of aggregate. Do you
3 have any idea what sort of vehicular pressure that would put
4 on the roads in addition to the 40 ore trucks per day?

5 A Well, I guess it depends how quickly they want it supplied.
6 I don't know if that's a bring it all at once kind of a
7 thing or they can meter it out over a period of years or
8 what.

9 Q And do you have any idea what in combination this human
10 activity, the vehicular activity, the mining activity will
11 create either as spikes or on an average in terms of
12 decibels of noise in the area during mining operations?

13 A Well, the mining facility is going to be masked by this
14 15-foot tall berm plus the rock outcrop that already exists.

15 Q I'm asking decibels. Do you have any idea of decibel
16 measurements at the mine site itself, a mile away, two miles
17 away, three miles away?

18 A No, I don't.

19 Q Okay. Do you know if anybody has tried to measure the
20 noise?

21 A No, I don't have knowledge of that.

22 Q And do you know if anybody has tried to measure the light
23 that would be generated?

24 A I don't know that either.

25 Q Do you know anything about plans to run additional power

1 into the mine site from some remote location, public
2 utility-type power?

3 A I don't know about that.

4 Q Okay. You mentioned early in your testimony -- I think you
5 were comparing -- when we were talking about your
6 credentials, you were saying, you know, "I've looked at a
7 couple mines, but I've also looked at pipelines." And I
8 think you talked about corridors --

9 A Utility corridors.

10 Q -- for easements. Utility corridors.

11 A Uh-huh; yes.

12 Q Okay. And so you have some experience with that; correct?

13 A I do.

14 Q And when you bring in utilities, that necessitates habitat
15 disturbance; correct?

16 A At least temporary, yes, along the right-of-way.

17 Q Cutting down trees and so forth; correct?

18 A Correct.

19 Q Okay. And if power is being brought in from some remote
20 location to this mine site, that's going to mean that all
21 along the way there would be a corridor of the kind you're
22 talking about; correct?

23 A Yes.

24 Q All right. Now, are you aware of whether anybody has
25 studied the effects of just that part of this mine operation

1 along the roads from wherever the utility is into the mine
2 site?

3 MR. PREDKO: I'm just going to place an objection.
4 I don't believe that this power line or running power from
5 the facility is part of the permit.

6 MR. WALLACE: Yeah. Well, that's true.

7 MR. PREDKO: And if it's not, it's obviously
8 subject to DEQ approval and not a part of this hearing.

9 MR. WALLACE: Well, we're going to connect this
10 up. So I just want to know what this gentleman knows,
11 because he's expressed an expertise in the area.

12 MR. REICHEL: I just want to join in the
13 objection. I don't believe that the record reflects that
14 Kennecott has applied as part of the pending disputed matter
15 to connect this facility through power lines to this
16 facility remotely. In fact, the permit application says
17 otherwise. There apparently has been some suggestion that
18 the possibility of doing that, looking at that alternative,
19 may be in consideration. But that's not presently in this
20 matter. So I don't believe that inquiry into this is
21 appropriate.

22 MR. WALLACE: And I don't have any further
23 questions on it anyhow.

24 JUDGE PATTERSON: Okay.

25 MR. WALLACE: Actually, your Honor, could I have a

1 short break and maybe gather some thoughts?

2 JUDGE PATTERSON: Yeah; sure.

3 (Off the record)

4 Sir, how many Kirtland's Warblers have you seen?

5 A A handful.

6 Q Okay. You went on the tour last year?

7 A Yes.

8 Q Okay. And where did you go, Mio?

9 A Grayling.

10 Q You went to Grayling?

11 A Uh-huh (affirmative).

12 Q Okay. There are a couple of different tours that you can
13 take; correct?

14 A Right; yes.

15 Q Okay. And who conducts those?

16 A Fish and Wildlife Service sponsors one set, and the United
17 States Forest Service sponsors the other.

18 Q And I think you said in your direct testimony that there --
19 they limit the number of people that can go on each tour;
20 right?

21 A Yes.

22 Q I mean, if you don't get there in time --

23 A There's a set schedule. Everyone show up here and queue up
24 and --

25 Q And you're not allowed to -- human beings are not allowed to

1 just wander into the habitat area and check it out
2 themselves as a general manner?

3 A They like you to stick together.

4 Q Right. And isn't this because of concern that human
5 disturbance will interfere with Kirtland's breeding and
6 livelihood in general?

7 A Yes.

8 Q You were -- when you were testifying about getting up close
9 enough to the Kirtland's to take a picture of it -- do you
10 recall that testimony?

11 A Yes.

12 Q -- suggesting that it -- the one, or whatever males were in
13 the Yellow Dog Plains were not afraid of human beings, you
14 recalled that Dr. Lindsey was using a powerful scope?

15 A Yes; right.

16 Q Okay. So he was really quite some distance from the bird he
17 saw; correct? Do you recall that?

18 A Well, quite some distance; 100, 200 feet. Certainly had to
19 be within a hundred yards I think even with a spotting scope
20 to get that kind of imagery.

21 Q Now, I sort of got the impression from your testimony that
22 if you go looking at Kirtland's Warblers down near Mio,
23 Grayling that you're practically in the military camp with
24 people shelling over your heads. That's not true, is it?

25 A No. The military area is just a small percentage of the

1 overall Kirtland Warbler habitats.

2 Q Okay. And much of that habitat is some distance away from
3 the military operation; correct?

4 A True.

5 Q Do you know anything about the amount of noise generated by
6 blasting explosives in hard rock mining?

7 A No.

8 Q You know that that's the type of mining that's going to be
9 conducted here is drill-and-shoot explosive blasting mining?

10 A Correct, underground.

11 Q Starting at the surface?

12 A Then working deeper, yes.

13 Q So you don't know what the -- what it'll sound like or how
14 far the sound will carry when that operation begins when
15 they first blast into Eagle rock, do you?

16 A Anecdotally I've heard blasting before at other facilities,
17 so I know it's loud, but I don't know what decibel level.

18 Q You don't know what measure of charges they're using here or
19 the composition of the chemical emulsion or any of that?

20 A No, I don't.

21 Q Okay. Now, I think that you said that the Kirkland's
22 Warbler that -- I don't know if you were talking about the
23 one in the newspaper or the one that Dr. Lindsey saw, but
24 that it was likely a male trying to establish a new breeding
25 area?

1 A Looking for a female.

2 Q Looking for a female; right.

3 A Once she nests I think she does the territory establishment.

4 Q Okay. Now, and I don't mean to be impertinent here, but

5 wouldn't you guess that that male had a better idea of where

6 it wanted to nest than you might have of what would be a

7 good nesting area for a Kirkland's Warbler?

8 A He would know best, yes.

9 Q Okay. So if you've got a singing male in June in the Jack

10 Pines, probably he's figured out this is a good place to do

11 it; correct?

12 A He's trying, yes.

13 Q He's trying. I mean, he could be wrong; right?

14 A Right.

15 Q But birds don't tend to go to inappropriate habitats to try

16 to breed, do they, sir?

17 A No, they don't, but Kirtland Warblers have a habit of

18 successfully nesting best in large colonies with multiple

19 singing males and multiple females being in the same

20 immediate habitat.

21 Q Right. You had a different theory from Dr. Lindsey than --

22 about insectivores and the effect of human activity on

23 insectivores. He opined that human activity would reduce

24 the number of insectivorous birds and perhaps increase the

25 insect population in a way that could be deleterious to

1 plant and tree life; correct?

2 A I guess that was his implication, yes.

3 Q Did you read his paper on the subject?

4 A I did.

5 Q Okay. Have you ever written a paper on the subject?

6 A No, I have not.

7 Q Did you read his paper on the subject and find technical
8 fault with it?

9 A No.

10 Q Your cumulative impacts analysis that you put up on the
11 board; is it -- was this your idea or is this a way of
12 analyzing how to study cumulative impacts?

13 A Yeah, the overlapping circles are pretty common in the
14 literature and in popular practice.

15 Q For the study of cumulative impacts?

16 A Yes.

17 Q Okay. And so you borrowed this idea of -- I mean, basically
18 it's a flower with Foth in the middle and you're one petal
19 and other companies are other petals; is that -- just in
20 case this doesn't go into the record, that's what I'm -- am
21 I describing that accurately?

22 A Yeah; right. Yup, overlapping disciplines all with a
23 central location.

24 Q And your candid remark that you know a little bit about a
25 lot of things; is that a characteristic of wildlife

1 biologists generally? Is that -- would that be part of that
2 kind of area of discipline to be eclectic?

3 A Well, you have to be well versed as a consultant in wildlife
4 biology, yes. You have to know a variety of disciplines as
5 opposed to being an academic or a research specialist where
6 you just do one thing all the time your whole career. You
7 have to be broad based.

8 Q Birds, plants, trees; people specialize in nothing but these
9 things; correct?

10 A Well, or maybe not -- maybe a tree.

11 Q Or maybe a tree?

12 A Yeah, one species. The nature of science builds on these
13 kinds of people who do those specialized studies. The
14 literature information trickles down to a published level,
15 then a generalist like me reads that material and proves the
16 knowledge on the subject.

17 Q You're more a generalist?

18 A As a biologist, yes.

19 Q Do you include reptiles among your areas of specialization,
20 or would you consider that something you know a little bit
21 about or nothing about?

22 A I know a fair amount about reptiles and amphibians.

23 Q Okay. Why in this study -- you know, three years of
24 studies, one for the mining application and two, I guess,
25 for this case -- did you not study any reptiles in the study

1 area?

2 A The frog and toad study was our amphibian or aquatic
3 perspective on that. Reptiles; if we had seen any in our
4 study area we would have noted them and recorded them. In
5 fact, any wildlife species. But it's not good reptile
6 habitat generally. We're talking well drained sandy soils
7 with Jack Pine.

8 Q Wouldn't you bet anything there's some reptiles living
9 there, sir?

10 A I didn't find any evidence.

11 Q But you didn't look for any?

12 A Well, I had my eyes open for them. The classic example:
13 egg casings, either turtles that are ruined by predators
14 like opossum or skunk. And wherever you have reptiles you
15 have reptiles laying eggs and where you have reptiles laying
16 eggs you have predators that come after them and eat them
17 and leave the rotted shells, which persists for years even
18 in the fine sands. And so I looked for that along the dirt
19 road along the wetlands and I looked for the turtle paths
20 and snake paths that make the sinuous evidence of their
21 passing. I didn't see any of that in our travels throughout
22 the Yellow Dog Plains.

23 Q Why didn't you note that in any of your reports?

24 A Well, I didn't see it, so I didn't write it down.

25 Q Okay. Did you lift up an occasional log or rock and look

1 for a snake ever, sir?

2 A Well, we did when we did our initial mammal surveys. The
3 traps are flat and the ground is irregular, so you have to
4 roll and move stuff around to situate them. You collect
5 ferns and leaves to cover them so any creature that might
6 get caught in the live trap would be shaded and not die in
7 the heat. So you're rooting around and that for the mammal
8 surveys. For the frog and toad surveys you're bushwhacking
9 in the dusk to the site and you do your survey work and you
10 walk back out often with a flashlight to get to your vehicle
11 and drive out of the whole area in the dark, which we did
12 frequently.

13 Q And a lot of the snakes that live in the UP are oviparous;
14 correct? They don't -- I mean, viviparous; they don't lay
15 eggs?

16 A Probably true, yes.

17 Q So you're not going to see egg cases --

18 A Not of snakes.

19 Q -- from water snakes or garter snakes or green snakes I
20 think?

21 A True.

22 Q Okay. In any event, you didn't see a single snake in the
23 Yellow Dog Plains, nor did anybody else for three years;
24 correct? Or 20 days spread over three years?

25 MR. PREDKO: I'd just object. Counsel, you

1 referred to the Yellow Dog Plains. Do you want to refer to
2 the study area?

3 Q Study area.

4 A No, we didn't record any snakes.

5 Q And did you look for salamanders?

6 A We didn't do a specific salamander survey; we just had our
7 eyes open for them, again, in the course of doing our other
8 surveys.

9 Q The salamanders don't tend to just walk by you on the path,
10 do they, sir?

11 A No, they don't.

12 Q Okay. You've got to go looking for salamanders?

13 A That's right.

14 Q On your hands and knees, you know, digging around; correct?

15 A Correct.

16 Q Okay. Did you do that?

17 A We didn't in the study area, in the immediate footprint
18 area because there wasn't any appropriate salamander habitat
19 there.

20 Q You mentioned that you didn't see any vernal ponds; correct?

21 A Correct.

22 Q Okay. Now, vernal ponds are the ideal place for frogs and
23 toads to lay their eggs; correct?

24 A Correct.

25 Q Okay. And this is because vernal ponds dry up and that

1 means fish can't live in them, and if fish can't live in
2 them then the fish can't eat the tadpoles that hatch out of
3 the eggs; correct?

4 A Correct.

5 Q Okay. So if you don't see any vernal ponds but there are
6 frogs in the area, does it strike you there may be vernal
7 ponds within the larger area someplace?

8 A Well, it strikes me that the frogs and the toads are
9 reproducing in the standing water or backwater of a beaver
10 pond or semipermanent water associated with the river.

11 Q Well, did you see that happening? Did you see the frogs
12 breeding? Did you see frogs' eggs?

13 A No. No, we heard them.

14 Q But you didn't go looking in the woods for vernal ponds that
15 might be the origin of the wood frogs for example?

16 A No. We did review the habitats for vegetation within the
17 direct impact area and it's all well drained sands and
18 excessively drained sands are a classic spot for Jack Pine
19 to do well, so we didn't expect to find them there.

20 Q Did you learn from the literature that in the area there are
21 box turtles, wood turtles, Blanding's Turtles?

22 A Potentially present, yes.

23 Q Okay. And are any of those threatened, sir?

24 A I think the Blanding's is a species of concern, a couple of
25 the others.

1 Q How about the box turtle?

2 A The box turtle; that's a specie of concern or a threatened
3 maybe.

4 Q Okay. And you didn't see any turtles whatsoever?

5 A No, we didn't.

6 Q In three years?

7 A No. No, we didn't.

8 Q Is it possible, sir, that the reason why you didn't -- you
9 or your team of four to ten people and the people in 2004
10 before you didn't come up with a single salamander or a
11 single turtle or a single snake, a single lizard in any of
12 this habitat is because none of these animals make any
13 noise?

14 A Well, I think it's more a function of the poor quality of
15 the habitat in our immediate study area.

16 Q The wetlands of the headwaters of the Salmon Trout River is
17 bad habitat for salamanders and turtles?

18 A No, but the immediate footprint of the mine area is
19 predominantly sandy soils. And even for the box turtle,
20 which is a terrestrial turtle; their upland habitat is more
21 of wooded MESIC environment with a good humus layer with a
22 rich abundance of slugs and other invertebrates that they
23 would feed on and we just have a very dry Jack Pine area
24 with sparse understory, so I wouldn't expect any reptile or
25 amphibian to be there.

1 Q And you say -- you redirected my question to the footprint.
2 Are you saying you didn't look for any of these animals in
3 the -- above the orebody and the Salmon Trout?

4 A Well, we conducted our frog and toad surveys -- in fact, the
5 one point is right on the edge of the orebody, so we were in
6 there conducting our frog and toad surveys and we didn't see
7 any reptiles in there.

8 Q No turtles, no snakes, no salamanders?

9 A No.

10 MR. WALLACE: I have nothing further.

11 MS. HALLEY: Mr. Kailing, I'm Michelle, Halley. I
12 represent the National Wildlife Federation and the Yellow
13 Dog Watershed Preserve. I'll try not to repeat what Mr.
14 Wallace has done.

15 CROSS-EXAMINATION

16 BY MS. HALLEY:

17 Q Now, you referenced a report as being a general census I
18 think and a snapshot in time -- representing a snapshot in
19 time. Now, I'm wondering if you had gone to the sites that
20 you visited a week earlier do you think you might have seen
21 something different; different species, different
22 concentrations of species?

23 A That's possible.

24 Q A week later could it have been different?

25 A Or a week earlier it could have been different.

1 Q Okay. Now, did you go down to the Salmon Trout River?

2 A Yes.

3 Q How was it -- how big was the river at your sampling point?

4 A Well, our frog and toad points were right near old beaver
5 dams or active beaver dams, so there was an impounded area.
6 Other mainstream areas were much narrower than that, but,
7 you know, you could throw a stone across all of it.

8 Q Okay. Now, have you conducted any winter tracking surveys
9 at your study area?

10 A Within our study area?

11 Q Right.

12 A No.

13 Q Have you done any aerial surveys?

14 A For?

15 Q Animals, large mammals.

16 A No.

17 Q And have you done any tracking with collars on large
18 mammals?

19 A Like a transmitter type GPS?

20 Q Right.

21 A No.

22 Q Okay. How would you compare the intensity of impacts from
23 humans in the sulfide mining setting versus in a oil and gas
24 exploration type setting?

25 A I guess I'm not following your question. Would you repeat

1 that, please?

2 Q What do you think -- which activity would create more human
3 impact, a sulfide mining facility like the one proposed
4 here, or an oil and gas exploration site?

5 A Well, it would depend on the nature of the oil and gas
6 exploration site.

7 Q Well, generally speaking. Have you ever seen an oil and gas
8 exploration site?

9 A I have.

10 Q Okay. About how big was it?

11 A Well, the ones I'm used to consist of a substation and maybe
12 a series of wells, you know, scattered over a larger
13 landscape. I compare that to a footprint of a maximum of
14 145 acres with a life span of under 20 years I see the
15 sulfide site as having less impact.

16 Q So your belief is that this site, which will cover roughly
17 145 acres -- fairly intense use, I would say, about 145
18 acres. Would you agree with that?

19 A Yeah; yeah. Yes.

20 Q Okay -- would have less impact than an oil and gas
21 exploration?

22 A Presuming the oil and gas exploration included fields that
23 would produce for 50 or a hundred years or a lifetime.

24 Q I'm talking about the kind of oil and gas exploration we see
25 in the Northern Lower Peninsula. Have you seen oil and gas

1 going on in the Northern Lower?

2 A Uh-huh (affirmative).

3 Q What does that typically look like?

4 A A series of small wells with a single cylinder pump
5 interconnected with a series of underground pipes, and
6 maintenance guys who drive daily in between the wells.

7 Q Right. About how big is the site?

8 A Oh, well, they could be huge. I guess it depends on the
9 well field. Where I live in Newaygo County some are only
10 six or eight wells; others in Antrim County --

11 Q How big are those? Like how many acres would that --

12 A A footprint of an individual well?

13 Q Right.

14 A It would be, you know, size of this room.

15 Q Okay. All right. And what kind of environmental impacts
16 does that have; do you know?

17 A Well, you'd have impacts in the direct footprint of each of
18 the pads and of the roadways that interconnect them and the
19 temporary disturbance from the pipelines that relay, and
20 then I guess impacts again if -- on restoration of the site
21 depending on its nature and how it was going to operate.

22 Q Are they lit typically?

23 A Not in my experience.

24 Q Okay. And how often are people there, coming and going; do
25 you know?

1 A Daily I would expect at most facilities.

2 Q Like what? One person? One vehicle? What do you think?

3 A Yeah, probably a team of two in a pickup.

4 Q Okay. Once a day?

5 A Or any maintenance checks once or twice a day.

6 Q All right. How about noise? Are they noisy?

7 A Not compared to like, you know, other kinds of industrial

8 noise.

9 Q How about compared to this mine do you think?

10 A I don't know. If there were compressors stationed or a

11 pressurized pump system or some other infrastructure needed

12 to move the raw product around, there might be a good-sized

13 building and a generator, 24/7 presence. But other fields

14 might not have that at all; they may not have any kind of

15 support needed or the support infrastructure may be located

16 miles from the field and it's connected by pipes.

17 Q And how about during the exploration process; do you have

18 any knowledge of that?

19 A Well, yeah, I know a little bit about seismic work and the

20 preliminary investigations for gas and oil fields. And

21 again, it's a sporadic grid system of laying out cables and

22 setting charges and detonating them and collecting the data

23 and picking up your cables and hand slashing right-of-ways

24 through the brush and cover to lay down your cables,

25 geologists going back and forth.

1 Q So would you typically characterize that process as high
2 impact, low impact? What's your assessment of it?

3 A Well, again, if it's long-term persistent through a
4 lifetime, you know, that could be considered a high impact.
5 It depends on the density of the wells and the life span of
6 the facility.

7 Q Okay. Now, are you aware that the DNR leases rights to
8 conduct oil and gas exploration?

9 A Yes.

10 Q "Yes"? Okay. Now, in 2007 the DNR leased some lands for
11 this type of exploration. Would you agree with me on that?

12 A I'll believe you, but I don't know about it.

13 Q Okay. Now, also when the DNR leased lands in the Kirkland's
14 Warbler habitat are you aware of any special safeguards they
15 might have put on that land in relation to their leasing?

16 A I would expect them to do that, but I don't know the
17 particulars.

18 Q Why would you expect them to do that?

19 A Well, that's -- they're obligated under the various
20 environmental statutes to protect species on public lands.

21 Q All right. Now, the limitation was this: "No drilling,
22 exploration, construction or maintenance shall take place
23 within a half a mile of a Kirtland Warbler habitat area from
24 May 1st to October 1st." Does that indicate to you that
25 Kirkland's Warblers might be sensitive to human impacts and

1 human presence?

2 A Yes. I know that the Grayling military base have an
3 agreement with the DNR and the Fish and Wildlife Service to
4 stay out of Kirtland Warblers' active nesting areas. And
5 their setback in one of their units is 100 to 330 feet as I
6 recollect. So that's another example of a public agency
7 buffer area for the nesting warblers.

8 Q Now, did you study any impacts to wildlife along the AAA
9 other than in the areas that showed up inside your red
10 outline?

11 A No.

12 Q Okay. How about the 510, County Road 510?

13 A No.

14 Q How about County Road 550?

15 A No.

16 Q Okay. Now, you said that there would be a difference in
17 your assessment of the impacts of a paved road versus a dirt
18 road; is that accurate?

19 A Yes.

20 Q What would you expect some of the impacts from paving to be?

21 A Well, paving generally implies heavier traffic, more volume,
22 higher speeds.

23 Q Okay. Which result in what kind of impacts to wildlife?

24 A More noise.

25 Q More noise?

1 A Yeah, generally from the faster vehicle, and more road
2 mortality from species getting out in the road and getting
3 hit.

4 Q Mr. Kailing, are you aware that in fact the company has
5 indicated that they intend to pave some portions of the AAA
6 Road?

7 A I wasn't aware of that; no.

8 Q Well, would you believe me if I told you that they have
9 indicated that to the Department of Natural Resources?

10 A I have no reason not to believe you.

11 Q Okay. Would that change your opinion about the impacts from
12 the roadways to wildlife?

13 A Minimally.

14 Q Do you think the noise would increase?

15 A Probably not, because the nature of that road, unless they
16 did major structural alignment to make it straighter --

17 Q That's another part of the plan actually.

18 A -- they're not going to be able to generate speeds, you
19 know. This road now is a basically 45-mile kind of a road.
20 Sharply crowned. It doesn't have much of a shoulder.

21 Q That's the way it is now.

22 A Yeah; right.

23 Q But in fact the company has indicated at least the potential
24 for straightening out portions of the road, which you just
25 brought up, and also paving. So what would that do to your

1 analysis about impacts?

2 MR. PREDKO: Place an objection, your Honor. This
3 is just another item that is not within the permit, not
4 within the application. It's not relevant to these
5 proceedings. And again, it's irrelevant hypotheticals;
6 things that would have to be run through, again, DEQ and
7 other state agencies.

8 MR. REICHEL: Join in the objection.

9 MS. HALLEY: Your Honor, the company has in fact
10 submitted information to the Department of Natural Resources
11 as part of the permitting process, because the DNR lease was
12 in fact attached to this application, that indicate exactly
13 the matters I'm discussing here.

14 MR. PREDKO: There's nothing in evidence to
15 support that. Absolutely nothing. And it's not part of
16 this record.

17 MS. HALLEY: Well, your Honor, I'm not sure that
18 the Intervenors can have it both ways. They want to put new
19 information into the record that wasn't part of the
20 application process, and now we are in a situation where
21 information has been submitted to state agencies that
22 certainly is relevant and they're objecting on the grounds
23 that it wasn't part of the record. So which is it?

24 JUDGE PATTERSON: I'll allow you to go ahead and
25 ask it even as a hypothetical.

1 A I would have to see a plan of exactly what areas were to be
2 straightened and what areas would be paved to answer that.

3 Q Generally speaking do you believe that straightening and
4 paving roads would impact -- would increase the impacts to
5 wildlife?

6 A It might, but it might not be that much different, depending
7 on the nature of the alignment, the nature of the paving.
8 Were there shoulders involved? Will it be designed for two-
9 way traffic? Will the posted speed limit go up? Will they
10 do clearing of a large right-of-way? You know, there's a
11 lot of factors to consider, so I can't really answer it that
12 well.

13 Q So in order to assess the impacts you would need all of that
14 information?

15 A Yes.

16 Q I'm unclear about exactly -- when you make the statement
17 that you don't believe this mine will -- I think your
18 statement is that it will have minimal impacts to wildlife.
19 Okay?

20 A Yes.

21 Q Which components of the mining activities did you take into
22 account when you made that conclusion? What are you
23 considering in your analysis?

24 A What components? Well, we're looking at the direct physical
25 disturbance of the footprint of the mine, noise from the

1 operation and maintenance, lighting, dust.

2 Q Is that all?

3 A Yeah. Those are the major ones.

4 Q Okay. Now, let's talk about each one for a moment. Noise;

5 do you have any idea what the decibel level at the fence

6 line will be?

7 A I don't.

8 Q How about -- do you have any idea of a quantity of light

9 leaving the site? Do you have any idea about that? A

10 measurement? A prediction?

11 A Yeah, I don't.

12 Q Okay. And how about dust? Do you know how far dust will be

13 spread across the site and then what -- at what levels?

14 A I know there's a fugitive dust plan, but I don't know the

15 quantities of dust involved.

16 Q All right. Now, did you take into account impacts from

17 blasting?

18 A I did not.

19 Q How about seismicity? Related to blasting again; that's

20 slightly different. Did you take into account seismicity?

21 A Yeah, my understanding that was all completed, but you're

22 saying there'll be more of it to be -- there will be more

23 conducted? So I didn't consider it; no.

24 Q And how about traffic at the site?

25 A Vehicular traffic? Pedestrian traffic?

1 Q Vehicular traffic.

2 A Did I consider that?

3 Q Right. The increase in traffic that would result if the
4 mine were there.

5 A Yes, I did consider that.

6 Q How so?

7 A Anecdotally based on current uses of the area and
8 anticipated increases in traffic based on the mining plan.

9 Q Did you figure out, for example, how loud these haul trucks
10 are?

11 A Well, I know how loud trucks are generally. You know, when
12 they're first cranking up in low gear and you're close to
13 them, you know, that's the 70 decibel range; 60, 70.

14 Q Did you go through the exercise of layering that noise with
15 the ambient noise of the site from the generators, for
16 example, or from the air emissions from the vent raise, or
17 from the crusher building or from the truck wash building?
18 Did you do an analysis like that where you added up all the
19 noise and figured it out?

20 A No, I didn't. No.

21 Q And this may be silly, since we just figured out that you
22 didn't know that parts of the facility and the roadway are
23 to be paved, but did you take into account additional --
24 well, not additional paving, paving; nothing there is paved
25 right now.

1 A I took into consideration that the footprint of the mine
2 would be either paved or -- for parking or for maintenance,
3 and I know that the storage of the ore I think is going to
4 be on a paved or concrete surface. So yeah, in my mind I'm
5 thinking of the whole 92 acres essentially paved or so
6 disturbed with compacted materials it's essentially paved.

7 Q But no paving on the AAA Road?

8 A No.

9 Q All right. And did you take into account predictions of
10 drawdowns of the water of the wetlands or the stream?

11 A I did look at that in the application.

12 Q What do you remember about your analysis?

13 A Well, that the relative impacts of -- on surface water and
14 groundwater are going to be incremental and that their
15 impacts on standing vegetation, woody or shrubby species in
16 particular, probably not significant over the life of the
17 facility.

18 Q Did you investigate different species and their sensitivity
19 to changes in water levels, for example? Did you research
20 that?

21 A I did not research that specifically; no.

22 Q Did you take into account air deposition of contaminants?

23 A No.

24 Q Now, are you aware that there's a federal law that's
25 commonly referred to as NEPA?

1 A NEPA?

2 Q NEPA.

3 A Yes.

4 Q Are you familiar with NEPA?

5 A I am somewhat familiar with NEPA.

6 Q Okay. Now, have you ever been a part of a cumulative
7 impacts analysis that was conducted as part of a NEPA
8 requirement?

9 A Indirectly.

10 Q Can you describe what that process is, if you know?

11 A Yeah. We provided one time some field data for a project
12 and that information was compiled by others and used as --
13 in a final analysis. We didn't have a hand in anything
14 beyond the initial data collection.

15 Q But you understand that NEPA requires a cumulative impacts
16 analysis?

17 A Yes.

18 Q And that this has been conducted thousands of times across
19 the country?

20 A Yes.

21 Q Now, on your slide number 2 the last bullet there the
22 heading at the top says, "Wildlife Surveys," and we have a
23 number of components of that. The last bullet says,
24 "Threatened and Endangered Species," and different points in
25 your slideshow and in your testimony you indicate that there

1 are only four species, threatened or endangered species
2 found at the site; right?

3 A Correct.

4 Q And could you name those for me?

5 A Bald eagle, osprey, wolf and merlin.

6 Q Okay. I just want the record to be clear, sir, that the
7 narrow leaf gentian, which is an endangered plant, has been
8 found at the site; in fact, right above the orebody. Would
9 you disagree with me about that?

10 A No, I don't disagree with you; that is true.

11 Q So your statements that these are the only four threatened
12 or endangered species that are at the site are incorrect?

13 A Well, I was looking at wildlife species and I believe there
14 other experts will testify to the plant component.

15 Q But I don't believe that you were always clear about that.
16 Sometimes you were saying "wildlife species"; sometimes just
17 a general statement. I just want to be clear; you don't
18 believe in fact that these are the only threatened and
19 endangered species at the site; is that correct?

20 A Yes. I believe that the fringed gentian is present near the
21 orebody.

22 MS. HALLEY: No further questions at this time.

23 Thank you.

24 REDIRECT EXAMINATION

25 BY MR. PREDKO:

1 Q Mr. Kailing, you were asked about whether you surveyed the
2 salamanders?

3 A Uh-huh (affirmative).

4 Q Are there any threatened or endangered salamanders that are
5 even known to appear or occur in the Upper Peninsula?

6 A None that I'm aware of.

7 Q And the -- when Dr. Flaspohler was here and talked about
8 salamanders, he mentioned the blue spotted salamander. How
9 common is that salamander?

10 A Well, the blue spotted is one of our most common salamanders
11 of this state.

12 Q Did the bird study that was referred to as the study that
13 Dr. Lindsey directed in 2004; do you know from listening to
14 the testimony when you were here who conducted that study?

15 A Well, an individual named Skye Haas seemed to be the leader
16 and author of the document, but it wasn't clear to me if he
17 did this all by himself or he had a field of trained people
18 to help him or a couple of friends hung out with him. It
19 really wasn't clear what their methodology was and what
20 training the staff had who conducted the survey.

21 Q And the team that you used to conduct your bird surveys; was
22 that a team of trained biologists?

23 A Yes, it was.

24 Q You were asked a lot of questions about truck traffic. What
25 truck traffic currently exists in and around the area where

1 the mine is going to be located?

2 A Well, the major industrial traffic currently would be
3 logging trucks hauling out wood products and associated
4 timber harvesting equipment, either self propelled or on a
5 flatbed. A road grader comes through once a week in the
6 summer months, and occasionally a county dump truck comes by
7 with a bottom scraper or some fill material to patch up the
8 road.

9 Q You were also asked some questions about the spruce grouse,
10 and the spruce grouse is a species of concern; correct?

11 A It is a species of concern, yes.

12 Q Okay. And what again does that mean according to the MDNR
13 if a species is a species of concern?

14 A A species of concern are species whose population is in
15 decline regionally or the population status isn't known.
16 And with regard to the spruce grouse, the MNFI abstract
17 states that the population is unknown in the UP and they
18 recommended further analysis of that.

19 Q Now, you were asked -- now, you were asked questions about
20 other threatened or endangered birds that were apparently
21 sighted somewhere within a nine-square-mile area within the
22 Yellow Dog Plains. Do you remember those questions?

23 A Yes, I do.

24 Q Okay. Now, if in fact there are birds somewhere in that
25 nine square miles -- and I guess I'm not sure where that is

1 in here and neither was Dr. Lindsey, but if there are
2 threatened and endangered birds that are outside of the
3 footprint of the mine site, what effect do you believe that
4 the proposed mine will have on those?

5 A I don't think it would have any effect on them.

6 Q Okay. And for argument's sake, if in fact a threatened or
7 endangered bird was determined to be using the habitat
8 that's in the footprint of the mine, what effect do you
9 believe that the mine will have on that bird?

10 A Well, given the fact that the habitat types are quite common
11 where the mine footprint will be and indeed common species
12 occupy the common habitat, if there endangered species there
13 in that common habitat it too would be displaced to similar
14 adjacent habitat.

15 Q The bird would fly away?

16 A The bird would fly away to another appropriate area. A
17 mammal would walk away or run.

18 MR. PREDKO: Thank you. I have nothing further.

19 MR. REICHEL: I have no questions. Thank you.

20 RECROSS-EXAMINATION

21 BY MR. WALLACE:

22 Q I guess your definition of "impact" doesn't include chasing
23 animals away? Am I understanding you correctly?

24 A No, that's an impact; yes. It's an impact that species will
25 immediately displaced from the footprint of the mine once

1 they start clearing ground.

2 Q And you have an opinion that this mine operation with its
3 ore trucks, its aggregate trucks, its fuel trucks, its
4 busses busing the people into work, its fugitive dust, et
5 cetera, will not have any impact on threatened or endangered
6 species in the area, even though you have no notion of the
7 measurement of any of the effects of those operations: the
8 light, the sound, the fugitive dust; not a single
9 quantitative element in your opinion? Am I understanding
10 you correctly, sir?

11 MR. PREDKO: I would just object to the
12 mischaracterization of his testimony as to whether he has no
13 notion of the magnitude of the effects.

14 MR. WALLACE: Well, if he wants to tell us what he
15 measured and how he computed any basis for his opinion this
16 is the opportunity.

17 Q What's the scientific component of your opinion here, sir,
18 is what I'm driving at?

19 A Well, my experience has been that industrial activities like
20 a mine don't have a big influence outside of, you know, a
21 short distance from the footprint of the facility. In my
22 literature research I found a diamond mine in Saskatchewan
23 where they measured nesting ground birds, including a oven
24 bird which is a species we observed here, and outside one
25 kilometer of this very large open pit facility with blasting

1 and excavating, all the accessory noise associated with the
2 mine, that the effects weren't measurable after a kilometer.

3 Q Okay. Well, oven birds live in people's back yards;
4 Kirtland Warblers don't, do they, sir?

5 A Well, they don't, but we don't have Kirkland's Warbler in
6 our study area. So my point is, to answer your question, I
7 think, you know, in lieu of advanced technologies to measure
8 all these things you mentioned: the air, the light and the
9 dust, there is a big buffer of space here. We've got a 145-
10 acre facility, we have 27 square miles of real estate, and I
11 don't think that the facility is going to have much impact
12 beyond its footprint. For human aesthetics? Yes. You
13 know, you drive by this and now it's an open area; there's
14 going to be a lot of infrastructure. It's a shock to the
15 aesthetics of a person who appreciates a natural
16 environment. But wildlife aren't humans; they react and
17 respond to whatever is in their environment. And if the
18 oven bird or the house wren or the spruce grouse can make do
19 and survive, you know, a stone's throw from the shadow of
20 the facility -- and they do at other facilities -- then I
21 think my assessment's fair, even though it's anecdotal,
22 invalid.

23 Q It's anecdotal because you haven't scientifically studied it
24 yourself or written it up; correct?

25 A Correct.

1 Q Well, could you tell us so we can look at these things with
2 our own experts for the balance of this trial? You know,
3 five, six, seven studies that you're familiar with that
4 support your view that this kind of industrial type activity
5 will not have an impact on the surrounding wildlife. Tell
6 us what we can go read that supports your -- if you haven't
7 done the studies yourself.

8 A Well, we have the diamond mine study. And I can get a
9 citation for you if you would like; I don't have it at the
10 tip of my fingers here. If you Google that you will find
11 evidence. You will find evidence of a study on birds and
12 roads in the Netherlands and -- where they looked at effects
13 on breeding birds from highways. In fact, you won't find a
14 study in the literature where they measured impacts of
15 roads, dirt roads like this, on birds. All the studies that
16 I could find were paved highways or major highways. In
17 those the heavy emphasis -- and virtually every one of those
18 road studies it was noise; noise was the issue. It wasn't
19 mortality, direct mortality. It wasn't fugitive dust.

20 Q I'm just asking you, sir, for --

21 A Citations?

22 Q -- the names of studies and the authors so we can go look at
23 these. Because we've looked pretty hard and haven't found
24 them, so could you help us right now?

25 A I can -- I have the information with me today; I don't have

1 it at my finger tips.

2 Q And the study in the Netherlands in fact showed that the
3 birds, the nesting birds were affected hundreds of feet off
4 the road, did it not, sir?

5 A In areas where there was no intervening vegetation from the
6 edge of the road, basically there was a pattern where there
7 was vertical vegetation, deciduous vegetation. The birds --
8 the buffer area was smaller and where there was a dense
9 coniferous forest adjacent to the road the effect of the
10 noise was minimized the furthest. And as I testified
11 earlier, we have an abundance of coniferous cover along the
12 AAA road.

13 MR. WALLACE: I have nothing further.

14 MS. HALLEY: Nothing, your Honor.

15 MR. REICHEL: Nothing, your Honor.

16 JUDGE PATTERSON: Thank you.

17 (Witness excused)

18 MR. PREDKO: We are done for the day if that's
19 okay with the Court.

20 JUDGE PATTERSON: Yeah. That's okay. See you
21 Monday.

22 (Proceedings adjourned at 3:34 p.m.)

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