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ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT
SETTLEMENT PROCESS

POSITION PAPER DISCUSSION MEETING #2

March 11, 1985

Northern Lights Inn
598 W. Northern Lights Blvd.
Anchorage, Alaska

Old Business: Deferred

New Business: Position Papers W-7, W-9, R-1, F-2.2, F-2.3, F-2.4, F-2.5

A T T E N D E E S

Bob Adler, Trustees for AK
Tom Arminski, APA
Bruce Bedard, CIRI Villages
Fred Chanania, PM&S
Jim Dischinger, APA
Chuck Elliott, HE
Randy Fairbanks, HE
Gene Gemperline, HE
Larry Gilbertson, HE
Chris Godfrey, EPA
Carol Gorbics, Corps
Mike Granata, ADNR
Dick Haggart, BHB
John Hilsinger, ADF&G/CF
Hank Hosking, FWS

Leroy Latta, ADNR
Eric Marchegiani, APA
Mary Maurer, ADNR/DGGS
Tom Mears, CIAA
Dallas Owens, HE
Kellie Rixse, HE
Jack Robinson, HE
Dan Rosenberg, ADF&G
Ben Rosenthal, NMFS
Phil Scordelis, HE
Brad Smith, NMFS
Tom Stuart, HE
Rick Suttle, HE
Jim Thrall, HE
Dave Watsjold, ADF&G/SF
Jim Wolfe, FMAA

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Transcript Errata

<u>Page</u>	<u>Line</u>			
62	10	"stowing"	should be	"storing"
69	6	"KC6"	should be	"Case E-VI"
69	15	"KC"	should be	"Case C"
70	23	"KC6"	should be	"Case E-VI"
70	23	"KC"	should be	"Case C"
85	19	"KC"	should be	"Case C"
85	21	"KC6"	should be	"Case E-VI"
92	7	"KC"	should be	"Case C"
93	1	"KC"	should be	"Case C"
97	25	"KC"	should be	"Case C"
98	3	"KC"	should be	"Case C"

ALASKA POWER AUTHORITY
SUSITNA HYDROELECTRIC PROJECT
SETTLEMENT PROCESS

POSITION PAPER DISCUSSION MEETING #2

8:30 a.m.
March 11, 1985
Alyeska Room
Northern Lights Inn
Anchorage, Alaska

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P R O C E E D I N G S

1
2 MR. ARMINSKI: This is the Alaska Power
3 Authority's second position paper discussion meeting. We're glad
4 you could make it this morning. Would you make sure that you
5 take the name card in front of you and put your name on it so
6 that the recorder can note your name so that when we prepare the
7 transcript we know who said what.

8 UNIDENTIFIED: Tom, if we run out of room
9 we should have some of the staff make --

10 MR. ARMINSKI: Right. Okay, at this time
11 I'd like to introduce our project manager, Mr. Jim Dischinger,
12 who will make some opening remarks. Jim.

13 MR. DISCHINGER: Good morning. For those
14 of you who were here at our last meeting, I want to thank you
15 for the good discussion we had. For those of you who are new
16 here at this meeting, we'd like to have that type of discussion
17 and really get some meaningful information this morning. Thank
18 you very much.

19 MR. ARMINSKI: Okay, for those you that
20 weren't here last week, I'll just kind of go over this briefly,
21 what we're going to try to accomplish today. We're going to dis-
22 cuss each of these position papers that were distributed a couple
23 weeks ago. And if you look here or one of these pages that were
24 on table, we've got some goals that relate to each one of these.
25 And what we'd like to do is to try and resolve these issues if

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1 possible. If you agree with our position, don't see any data
2 gaps, whatever, if we can get some agreement we'd like to do that.
3 Lacking that, we'd like to identify any data gaps that you feel
4 are in the paper, review the analytical methods, decide if they're
5 appropriate or not, talk about the mitigation measures that we've
6 proposed. There may be some other mitigation measures that we
7 haven't thought of that you may feel are appropriate. And the
8 last two things we'd like to do are agree on how we're going to
9 -- or, what type of settlement instrument we're going to use for
10 each of these issues. For example, we talked about maybe a letter
11 between an agency or an intervenor that says "we agree with you,
12 this is not an issue, the mitigation you've proposed is adequate".
13 Or else the resolution of these issues may be addressed in a great
14 big formal settlement document that's presented to FERC during
15 the licensing process.

16 We'd like to try and resolve exactly what means are appro-
17 priate for each of the entities to agree that this has been
18 resolved.

19 Let's see. The Susitna Settlement Plan, I think you've
20 all received a copy of that. Basically it's the intent of the
21 Power Authority to identify and resolve these issues with all
22 the parties. We plan to do this by discussion of these position
23 papers and go through this process that I've just mentioned,
24 identify data gaps, agree whether or not mitigation's appropriate
25 and execute some sort of a settlement instrument. So I won't

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1 dwell on that.

2 The -- One of the things that we've felt is necessary
3 to do is develop a preliminary position endorsement matrix. We
4 understand that a lot of us here are staff level people and can't
5 speak for our organization or agency. And so at this time we
6 may not be able to reach any sort of official agreement on an
7 issue. This would be -- the position or the agreement would have
8 to be elevated through our board of directors, directors, regional
9 supervisors, whatever. But to allow us to proceed through this
10 process, we've developed this preliminary position endorsement
11 matrix, and a copy of that is on the -- in the back of the room
12 there, and there's also a reduction on the table here. And basi-
13 cally all that does is list all the issues on one axis and all
14 the participants on the other axis. And it's just sort of a score-
15 keeping card to give us an idea of where we are on each of these
16 issues. And, for example, if you agree that this thing is
17 resolved, you can put your initials in there that you agree or,
18 if you disagree, you can put that in there. If you're not --
19 you know, if you don't care about that issue, if it's not one
20 of importance to you, you can -- you can denote that. It's just
21 a way of ours so we can keep track of where things are at in this
22 process that's going to take several months.

23 MR. ROBINSON: Tom, you might want to mention
24 that during the process that we go through, anyone that initials
25 the matrix can feel free at any time to come and take their

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1 initials off or change the preliminary -- their preliminary judg-
2 ment on the Power Authority's position. So that later on in the
3 settlement process if some things come to light that you feel
4 influence your preliminary endorsement in any way, why, you can
5 make those adjustments on the matrix.

6 MR. ARMINSKI: Okay. Old business. What
7 we had decided to do here is that in the preceding meeting we
8 had some suggestions on how these position papers needed to be
9 modified, or there were some additional mitigation measures that
10 were brought up. And we felt the best way to carry that on into
11 the future is to revise these papers and we would discuss those
12 revisions under old business. And I see that we don't have any
13 of that completed today, so we're not -- I just mention it. But
14 in the future we'll discuss those changes under old business.

15 So, moving right into new business, it's the discussion
16 of the position papers. The first one is the significance of
17 inundation or other disturbances to bald eagle, golden eagle and
18 other raptor's nests. And it's our position that our mitigation
19 measures that are proposed in this paper will mitigate the impact
20 of the project on raptors. Let's see, Chuck is going to discuss
21 that. Chuck?

22 MR. ELLIOTT: At the very beginning of it
23 here, I believe in your packages you received a copy of W-7 some
24 time ago. In the process of going through it and reviewing it,
25 I came up with egg on my face, because a couple pages did not

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1 include an expansion in the mitigation measure discussion about
2 what will be done for a certain number of the nests, and that's
3 what this paper being circulated now is. Basically it's an exact
4 copy of the one you received, but there's a -- on pages 13 through
5 16, some of the mitigation measures there are expanded to address
6 nests and in a worst case situation, that if they do get a -- if
7 they are vulnerable to disturbance from borrow sites, what will
8 be done. I'll address those as we go along.

9 But basically the paper talks about middle -- the middle
10 basin was surveyed for raptors, 1974, 1980 to '81 and 1984. 67
11 raptor and raven nesting locations were reported. There are 23
12 golden eagles nesting locations in or near the project area, at
13 least five of these locations will be inundation, five to seven,
14 which represents three to four pairs of eagles, and two nesting
15 locations will be partially inundated. As you read in there,
16 a nesting location consists of a number of nest sites. And when
17 we say "partially inundated", one nest site out of three at a
18 location would be affected by the project. There would still
19 be nest sites available.

20 Ten bald eagle nesting locations have been found in or
21 near the project area. Three will be inundation, which repre-
22 sents two to three nesting pairs of eagles. One location may
23 incur some damage because the maximum level of the water will
24 occur -- will be at the base of the tree. And one location may
25 be vulnerable to disturbance because of the railroad.

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1 Peregrin falcons do not appear to nest within the project
2 area because -- apparently because of the lack of suitable habitat.
3 Six gyrfalcon locations have been found, one would be lost due
4 to the project. Three goshawks locations, two would -- two nesting
5 locations would be lost. And 25 raven nesting locations, of which
6 12 would be lost.

7 Oh, and the paper that you're receiving, the text on Page
8 13 through 16, the main body of the text address these nesting
9 locations, three golden eagle, one bald eagle. On Pages 13 through
10 16 in the copy that was handed around to you. We addressed the
11 idea that if borrow activities were to interfere, we took a worst
12 case situation, talking to the engineers, that would they be able
13 to keep outside of the distance bounds that we wanted to to make
14 sure there was no disturbance to the nests. They could not guar-
15 antee that that wouldn't happen, so we addressed these nests as
16 a worst case situation, if they were disturbed, what would be
17 done. It had already been discussed in the text, it was just
18 in the mitigation measures that they needed to be further discus-
19 sed and enhanced, and that's what that revised paper is that
20 you're getting around.

21 MR. BEDARD: I have a question on -- I noticed
22 in the report that the bald eagle, there were two new sites.
23 And the question is, a lot of these sites that you're talking
24 about that's going to be lost had been inactive, some of them
25 quite a few years. And I find it interesting that the bald eagles

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1 didn't use those existing sites and created new sites. It gives
2 me the indication that the bald eagle will go to new locations
3 regardless whether there's old sites or not.

4 MR. ELLIOTT: They will. Oftentimes they'll
5 have more than one nest site, and they may have up to three or
6 four and use one one year and not reuse it for four or five years,
7 or at all. But the possibility that the ones that are going to
8 be affected may not be used or -- you know, for a number of years
9 is -- you know, is real. But they do come back and reuse them
10 and so they had to be considered. But a number of the nest sites,
11 both golden eagle and bald eagle, will do this, have a number
12 of nests and they'll use maybe one of them and then not come back
13 to it for three or four years. But they do have a number of nests
14 that they do not come back to for quite some time.

15 MR. HOSKING: What sort of plans do you have
16 for establishing artificial nesting to see if these bald eagles
17 are going to, in fact, utilize artificial nesting trees and this
18 type of thing?

19 MR. ARMINSKI: You mean prior to initiating
20 the project mitigation?

21 MR. HOSKING: Would you wait until you have
22 a license in hand, this type of thing? Would you start in the
23 fall of '85 or what might the plans be for that?

24 MR. ARMINSKI: Well, we did have that discus-
25 sion with you and Larry over at the Fish & Wildlife Service, and

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1 I -- you know, that is one thing that we might look into, is
2 establishing trials in this area to see whether or not in fact
3 the eagles will utilize these nest sites, the artificial nest
4 sites. And I've not -- I don't think we've come to a decision,
5 at least in our own minds, whether or not to exercise that option
6 at this time yet.

7 MR. HOSKING: Okay, that's -- that's my ques-
8 tion, to see if you have made any further decision on when this
9 might be --

10 MR. ARMINSKI: No, we haven't.

11 MR. HOSKING: -- established. I'd like to
12 recommend that we start in the fallk of '85.

13 MR. ARMINSKI: Any other discussion? Get
14 some agreement that the mitigation measures that we proposed are
15 appropriate?

16 MR. ROSENBERG: Yes, I agree with that.
17 I do support what Hank is saying, though, also, that some sort
18 of trial -- experiment, you know, some experiment be done prior
19 to construction.

20 MR. ARMINSKI: One other -- I guess, Hank,
21 this --

22 REPORTER: Could I find out who he is?

23 MR. ARMINSKI: Dan, would you put your name
24 on your name card? Dan Rosenberg. Would you suggest that this
25 experiment be conducted within the project area? We had some

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1 discussion whether or not to do this near Tanana as well. Do
2 you have any feelings as to which is the more appropriate place
3 to do it?

4 MR. ROSENBERG: No, not really. What were
5 the reasons why not to do it in the project area? Were there
6 reasons not to do it in the project area?

7 MR. ARMINSKI: No, there weren't any reasons
8 not to do it -- well --

9 MR. HOSKING: -- Access and that sort of
10 thing, getting in there.

11 MR. ROSENBERG: Yes.

12 MR. FAIRBANKS: There's one other reason,
13 too, and that is that it may be difficult to conduct an experiment
14 where you -- you know, when the reservoir causes the loss of these
15 nest locations, the eagles are somewhat more highly motivated
16 to look for, you know, new nesting locations. So without having
17 a loss of their existing locations, you know, putting in artificial
18 nesting locations in an area won't necessarily attract eagles
19 away from their existing locations. So we were thinking that
20 there is -- there are some sites along the Tanana that may be
21 subject to loss due to river action and blow-down. We were
22 thinking it may be more appropriate to go into a place where a
23 nest is actually lost and so obviously the eagles are much more
24 highly motivated to seek out a new location.

25 MR. ROSENBERG: The only one I was maybe

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1 curious about like I know Portage Creek was one of the proposed
2 areas, just because there was a -- everything seemed right except
3 that there were nest sites may have been eliminated. And I think
4 that might be interesting, to see how well that -- how that works,
5 attracting additional pairs. But I have no real problems with
6 trying it up in Tanana.

7 MR. ARMINSKI: Any other comments on W-7?
8 Let's see, on -- This is a -- I won't say it's peculiar but this
9 is an item that would be addressed through the Bald Eagle Protec-
10 tion Act, and would, in particular Hank, you agree that the way
11 that -- or, the instrument to settle this would be the permit
12 that we seek with the Fish & Wildlife Service?

13 MR. HOSKING: (Nods affirmatively)

14 MR. ARMINSKI: Okay, the next paper for dis-
15 cussion is W-9, this is the significance of reduction in wildlife
16 habitat due to construction camps/villages, permanent town and
17 airstrips. Our position is that the mitigation measures that
18 we've proposed in this paper would minimize the loss of this habi-
19 tat, and furthermore, that the habitat is not unique or biologi-
20 cally significant, and that anything that can't be restored on
21 site would be offset by the enhancement of other areas. Chuck,
22 are you --?

23 MR. ELLIOTT: The paper utilized wetland
24 mapping providing by the National Wetland Inventory team of the
25 U. S. Fish & Wildlife Service. And basically we used the

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1 information provided for facility sitings and sizes presented
2 in the license application. And using that design for facilities
3 and the wetland mapping provided by the Fish & Wildlife Service,
4 approximately 26%, or about 146 acres, of wetlands will be impac-
5 ted by facilities as they are currently designed and located.
6 The areas -- the wetland areas considered are not what you would
7 consider unique wetlands in terms of what are we talking about
8 when we're talking about unique. The idea of looking at it in
9 terms of waterfowl breeding areas, such as -- well, what I'm
10 familiar with, with prairie pothole regions. There are -- the
11 wetlands up there are primarily saturated shrub and emergent bog
12 where there's no real standing -- large standing surface water,
13 but the soils remain in a saturated state. More of what we think
14 of as a bog. Primarily birch shrub, sphagnum, sedges and blue-
15 berry. And as a result of the facilities as they are designed
16 now, about 146 acres of wetland would be impacted.

17 MR. ARMINSKI: Do you want to talk about
18 the master plan?

19 MR. FAIRBANKS: We might mention that Harza-
20 Ebasco is in the process of preparing a master plan for project
21 facilities, and that master plan will include support facilities
22 at Watana. That master plan will include a re-evaluation --or,
23 that effort will re-evaluate the siting of these facilities and
24 one of the criteria that we will use will be wetland habitats
25 and other unique habitats when we're re-evaluating the locations

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1 of these facilities, and that will include the camps, the airstrip
2 and I think the access road. That re-evaluation, I think, is
3 scheduled to take place this summer, and be completed by the fall.

4 MR. ARMINSKI: Any comments on this?

5 MR. ROSENBERG: Is that road on the south
6 side of the river going to remain? What's also going to happen
7 to the -- you know, this just includes the camps and what about
8 all the roads in between and other -- any other -- well, primarily
9 the roads, but what else might be out there?

10 MR. ARMINSKI: Okay, the master plan basi-
11 cally addresses all the things that'd be required to build the
12 Watana phase of the project. When Acres (ph) prepared the license
13 application it was basically a paper exercise. They took the
14 maps and sited things on paper as best they could. There's been
15 a lot of concern raised about, you know, things being located
16 in wetlands and, in addition, from an engineering perspective,
17 you know, for example the borrow sites are much larger than they
18 need to be, just to demonstrate that, you know, it's feasible
19 to build the project. You know, the road may cross wetlands,
20 whatever, and both from a biological perspective and an engineering
21 perspective, that's not really the most desirable way to go.
22 So the intent of this master plan is to go out, look at the mater-
23 ial sites, the locations of the permanent and temporary facili-
24 ties, the roads, I imagine, that would go between them, and the
25 access road for some realignment and relocation of those sites.

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1 So that from the -- from an engineering and biological perspective
2 we've got the best site plan.

3 MR. ROSENBERG: And what about rehabilita-
4 tion of the camps south of -- say, for Devil's Canyon south of
5 the river there?

6 MR. ARMINSKI: Okay, that's not addressed
7 in this phase of the master plan.

8 MR. ROSENBERG: Okay, that'll just be
9 addressed later on. But what's the intent there, do you know?

10 MR. ARMINSKI: I think what we're going to
11 do is just go with what we've got at the present time. In detailed
12 design we'll probably have to address that, but Watana being some-
13 thing that needs to be gotten underway quickly, we're working
14 on the master plan on that.

15 MR. ROSENBERG: Okay. Is that road going
16 to be a permanent road is what I was --

17 MR. ARMINSKI: Between the two facilities?

18 MR. ROSENBERG: Well, yes, to the camp that
19 will be the construction camp, Devil's Canyon.

20 MR. ARMINSKI: Yes, that would be a permanent
21 road.

22 MR. ROSENBERG: The other -- a couple of
23 other comments on this. One was just some of the things that
24 were listed as mitigation just really weren't -- really weren't
25 mitigation, I don't think. Such as there's one about improving

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1 the quality of the maps and they were steps towards various miti-
2 gative actions, I think, but they really weren't mitigation per
3 se, and they were just listed under -- under mitigation for the
4 project. Find that page.

5 MR. HOSKING: 6.

6 MR. ROSENBERG: Oh, thanks. Oh, like Number
7 8, refine high resolution wetland maps of the project area. And
8 then -- well, that was -- that was the main -- some of them just
9 didn't go quite so far, as Number 5, develop -- rather than
10 develop and say implement a comprehensive site rehabilitation
11 plan, but -- just minor points as to -- I didn't think all of
12 these things that were listed as mitigation measures really were
13 mitigation measures. And the other thing was that it is stated
14 that the locations where facilities are sited do not contain uni-
15 que or otherwise high value wildlife habitat or known special
16 use areas. And apparently some of those areas are valuable fora-
17 ging areas for black bears, and I'm only bringing it up as that
18 I just don't think the statement is all that accurate. I don't
19 think the conflict is something that really -- probably can't
20 do a whole lot about, but in the bear reports, those areas were
21 mentioned as valuable foraging areas by black bears --

22 MR. ELLIOTT: Yes, there are some --

23 MR. ROSENBERG: -- in July and August.

24 MR. ELLIOTT: Yes, some of the borrow sites.

25 I guess what kind of got -- I was so into wetlands, I kept thinking

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1 about wetlands and waterfowl, essentially, but yes, there are.

2 You're right.

3 MR. ARMINSKI: We can make that revision.

4 MR. ELLIOTT: Yes.

5 MR. LATTA: Tom, could we make one other
6 revision to Page 7? Could we change "compensation lands" to
7 "mitigation lands"?

8 MR. ARMINSKI: In Number 9?

9 MR. LATTA: Yes.

10 MR. ARMINSKI: Okay, I guess, at least as
11 far as the type of instrument that would be used to agree on the
12 settlement, I see several things. First would be the Corps of
13 Engineers wetlands permit, and that would -- we have a public
14 review on that, interagency review. Second would be any state
15 permits for rights of way, leases, materials sites, those sorts
16 of things, which would also undergo interagency review. And I
17 think both of these permits would have -- I assume would include
18 mitigation measures to reduce or minimize impacts, as well as
19 stipulations for restoration after the activities had ended.
20 Is that correct?

21 MR. LATTA: Depends on the -- you know, what
22 we agree to as the overall mitigation plan. It may just include
23 that, we may not need anything more specific. We're still talking
24 to Eesh (ph) about exactly how we're going to deal with all that.

25 MR. ARMINSKI: And I guess the third item

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1 would be the overall mitigation plan with agreements on mitiga-
2 tions lands and restoration.

3 MR. ROSENBERG: What was that? Would you
4 go through that one more time?

5 MR. ARMINSKI: Okay, I guess basically I
6 saw three things being the instruments to address this concern.
7 One would be the Corps of Engineers permit for wetlands distur-
8 bances, second would be any state permits for land use, primarily
9 DNR's permits, and then the third thing would be the overall pro-
10 ject mitigation plan, terrestrial mitigation plan within the
11 agreements on mitigation lands.

12 MS. GORBICS: I would, just from the Corps'
13 standpoint, like to agree with Leroy. The more that we can
14 finalize here, the less we have to worry about in our permit.
15 You know, it could be part of the project instead of part of the
16 permit.

17 MR. LATTA: Right, we can keep it down to
18 three or four pages.

19 MR. ELLIOTT: Just this one point while we're
20 here if you want to take a break, an example we'll have here,
21 if anybody would like to see an example of the detail of the wet-
22 lands mapping that's being done for the project area. We just
23 brought some examples if anybody would like to see them.

24 MR. ROSENBERG: That was a problem -- a ques-
25 tion I had. Will we be able to get these maps?

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1 MR. ELLIOTT: Yes, I think there's 13 --

2 MR. FAIRBANKS: Fish & Wildlife Service is
3 completing them right now. We've got three of the mylar versions
4 and we can make paper copies of three of the quads right now.
5 And the other ones are coming in weekly, just being printed up
6 right now. So it's just a matter of weeks before we get all 13
7 quads.

8 MR. LATTA: Tom?

9 MR. ARMINSKI: Yes.

10 MR. LATTA: I should've brought it up under
11 old business, but I'd like to discuss W-5 when we get through
12 with these for just a moment.

13 MR. ARMINSKI: Anything else on W-9? Okay,
14 R-1 is the significance of impacts on fishing, including avail-
15 ability of fish, access and quality of experience. This relates
16 to recreation. Our position is that our proposed mitigation mea-
17 sures adequately address the impacts and that the overall effect
18 of the project on recreational fishing would be a positive impact.
19 Rick?

20 MR. SUTTLE: I think it's important to focus
21 that R-1 is -- as Tom mentioned, it's on the activity or the oppor-
22 tunity for fishing. And basically our findings in this paper
23 were based on a number of the fishery impact studies that's in
24 the license application, as well as a number of the recent fishery
25 studies that were done, and a couple of those are -- those are

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1 listed in the back of this paper. This information was also con-
2 sidered then in conjunction with a lot of the use and demand stu-
3 dies that was done in Chapter 7, the recreation chapter, of the
4 license application. And a lot -- these estimates were based
5 on 1981 ADF&G statewide harvest studies, state comprehensive out-
6 door recreation plan, and in particular the participation rates
7 of those -- that was listed in those. And some recreation data
8 and projection methods that were developed by the Soil Conserva-
9 tion Service in a Susitna Area Basin Cooperative Plan done in
10 1978. And then also discussions with local sources on refining
11 capture rates for the project area.

12 Basically the findings, as we mentioned, if we break it
13 down into three areas, it's our -- it's our position that the
14 downstream areas downstream of Devil's Canyon, that the oppor-
15 tunities for fishing will not be affected to any great degree.
16 Reservoir areas, there's very little use there now because of
17 the remoteness, limited auto access. And basically even with
18 the reservoirs people will still be able to fish into those tribu-
19 taries where they go now, like Kosina Creek. The upper basin
20 area, or the area affected by the access road, will be the area
21 that's most affected for opportunities for fishing. And there'll
22 be a significant increase in the opportunities for fishing in
23 that area. And we realize there that some management -- types
24 of management, and that's what reflected in the mitigation measures
25 in this paper, will be needed there, particularly for Deadman

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1 Creek, where there's trophy-sized grayling. We want to maintain
2 that management and the mitigation is -- that we recommend there
3 is to recommend to the Board of Game that that be set up as a
4 catch and release type fishery. That's basically it.

5 MR. ARMINSKI: Dave?

6 MR. WATSJOLD: I'm raising my hand. I'd
7 like a little -- hear a little bit more about this propagation
8 program proposed up there. I see you got introducing rainbow
9 trout again, and you're talking about introducing rainbow trout
10 in the reservoir, to create a rainbow trout fishery in the reser-
11 voir? Is that what the goal is, that option?

12 MR. SUTTLE: Larry, do you want to --

13 MR. GILBERTSON: Well, that's just one of
14 the options being discussed, and, you know, it hasn't been offi-
15 cially set aside, so we just continue to include it as an option.

16 MR. WATSJOLD: Well, I don't believe that's
17 even a viable option in the reservoir at all.

18 MR. ARMINSKI: Well, I think we've talked
19 about this before. Is this -- should we just forget about that
20 from now on?

21 MR. WATSJOLD: Yes, I was surprised to even
22 see it in here.

23 MR. ROSENBERG: We've commented on that,
24 you know, a few times in the past --

25 MR. GILBERTSON: We'd be happy to drop them

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1 because I agree with you, I don't think that's a very viable
2 alternative. We keep including it just because it hasn't been
3 agreed by everyone that it ought to be dropped.

4 MR. WATSJOLD: Okay, the other one in there,
5 propagation -- the stocking of lakes outside the project area.
6 Can you go into that one a little bit more?

7 MR. GILBERTSON: Well, again, that's the
8 same thing. We brought it up in the mitigation workshops and
9 it's proposed as an option for mitigating for effects. And so
10 we just continued to list it as an option until everybody agrees
11 that we ought to pursue it or drop it.

12 MR. WATSJOLD: Well, we've got a very active
13 stocking program outside the area from Talkeetna all the way into
14 Anchorage right now that's probably pretty much maxed out. I
15 don't think you could create any more than we're -- the Depart-
16 ment's already creating out there now as far as stocking outside
17 the area.

18 And then Number 3, the project area lakes near proposed
19 recreation camp sites and trails will be stocked. Is this a
20 stocking or are you talking about a maintenance-type stocking
21 or where you're stocking from year to year? Are you talking about
22 getting new populations established in lakes in the area? My
23 impression is there's very little -- very few lakes that you'd
24 be able to stock that already have fish in them to create addi-
25 tional fishing up in that reservoir, and there may be some lakes

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1 up there that are landlocked that would create -- you could create
2 catch and release fishing -- or, just put and take fishing, but
3 being that the effort's going to be extremely light up there,
4 the cost benefit of such a stocking program would be extremely
5 low. I just don't see very much opportunity to work with area
6 lakes up in the impoundment area, in those high-altitude lakes.

7 MR. SUTTLE: Dave, I think that's something
8 that we do need to look at. There's -- for instance, in the
9 recreation plan there's a camp site proposed on Mermaid Lake,
10 and I think, you know, the benefits for fishing need to be looked
11 at, you know, in terms of that lake. Are there -- are there,
12 for instance, sufficient stocks in the lake now that they can
13 derive that benefit from, or is it worth even proposing stocking?

14 MR. WATSJOLD: What's in Mermaid Lake right
15 now?

16 MR. SUTTLE: Well, that's the thing, I don't
17 think that's one -- in some of the access -- in some of the aqua-
18 tic studies, I don't think that's one that has been looked at
19 yet for any fishery potential.

20 MR. WATSJOLD: Well, right now from what
21 I've seen the opportunities are extremely limited up there for
22 that type of program. And of course, this Number 4, contingent
23 on stocking rainbow trout in the reservoir, creating boat access
24 in there, so if we're not going to consider rainbow trout in there,
25 I don't believe that's a viable option there.

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1 Number 5 in here, you've got additional access will be
2 developed through trail and trail-like (ph) construction to streams
3 identified in the project area as having recreational fishery
4 potential. I discussed a little bit before about outside the
5 project area access, and I know I was contacted after the mitiga-
6 tion meeting about my ideas on access outside the area. Is this
7 still an option that we can look at or -- right now we've got
8 identified additional access in the project area. I don't know
9 where you're at in that program. I know I've provided some infor-
10 mation on my thoughts on the access.

11 MR. ARMINSKI: Yes, I think it's still a
12 consideration.

13 MR. WATSJOLD: Outside the project area?

14 MR. ARMINSKI: Sure. At least from --

15 MR. WATSJOLD: It's not listed in here at
16 all and I think there should be some mention of it in there. As
17 far as I know, you talk about including it in your mitigation,
18 the mitigation plan that comes out. Because that's what I'd look
19 at as a real viable opportunity, looking at recreational access
20 outside the project area.

21 MR. ARMINSKI: Well, do you think that we
22 should just -- or, basically the Fish & Game's position would
23 be to forget about enhancement within the project area and focus
24 on --

25 MR. WATSJOLD: Well, there may be some real

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1 limited, like -- well, some of the roadsides, there may be some
2 very isolated -- I don't think they're very large. I mean a very
3 limited opportunity. I'm not familiar enough with all the lakes
4 that have been looked at up there, I'm not sure whether all the
5 opportunities have been looked at yet.

6 MR. ARMINSKI: Yes. Well, you know, I think,
7 as Rick mentioned, that additional opportunities are going to
8 be developed, for example on Deadman Creek. But we were trying
9 to focus on creating some additional opportunities as well.

10 MR. SUTTLE: Number 5 here basically addressed
11 the -- I think the transmission and access aquatic investigations
12 report where in there there were identified some additional streams
13 along the access quarter that may have recreational potential
14 based on the investigations. And so that's the thing that this
15 particular Number 5 here is addressing.

16 MR. WATSJOLD: Oh, okay. Yes, I read that
17 report.

18 MR. SCORDELIS: Dave, there are, I think,
19 two lakes near Watana camp, High Lake or Highest Lake, a couple
20 of those lakes in there do have rainbow populations in them now.
21 So that might be a particular area where a trail head and then
22 a maintenance stocking might be effective.

23 MR. WATSJOLD: Have an airstrip right by
24 High Lake. I'm not sure what the access is, whether it's --

25 MR. SCORDELIS: There's one there now?

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1 MR. WATSJOLD: Yes, there's a lodge and air-
2 strip at High Lake. I'm not sure how -- whether the average per-
3 son could go up and land on that airstrip or not, I don't know
4 what the status of that is. And the one here, I know we discussed
5 this over and over about a year ago, and I was rather distressed
6 to see a mitigation option in here, this catch and release fishing
7 proposed to the Board of Fisheries. We don't feel that recommen-
8 ding management proposals to the Board of Fisheries should be
9 a mitigation point in this -- in your plan. Certainly something
10 would have to be done to manage those fish in Deadman Creek, but
11 we feel that's our option to go into management and make the
12 recommendations in there, and we don't necessarily agree that
13 catch and release fishing would be the mitigation -- or, the
14 management method we'd want to use up on Deadman Creek. And I
15 don't feel that's appropriate to be in this plan at all.

16 MR. ARMINSKI: Okay, would you -- would you
17 say that, then, as far as Deadman Creek goes that we not propose
18 anything, basically, and that the Department of Fish & Game would
19 take care of that through its own management efforts?

20 MR. WATSJOLD: Yes, I don't think -- I don't
21 think it's a mitigation option that you have to recommend the
22 proposal to the Board of Fisheries. We'd certainly -- I know
23 I certainly would go in and, since it is a real unique population,
24 we're familiar with the grayling population, it can be easily
25 overfished, we would certainly have to recommend special

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1 management on the stream as far as maybe spring closures, maybe
2 terminal gear or -- this catch and release fishing also causes
3 mortality also and it's a situation where we don't want to see
4 catch and release fishing, because it's a -- strictly catch and
5 release year around if it does mortalities. So it may take a
6 number of different management options to look at to protect that
7 population. I can't agree with just looking at catch and release
8 fishing under that.

9 MR. ARMINSKI: Okay, but I guess the point
10 is is that they --

11 MR. WATSJOLD: -- It be left out. I'd just
12 as soon leave it out of there and have us worry about it.

13 MR. ARMINSKI: Okay.

14 MR. THRALL: Dave, would you like to not
15 see it mentioned at all in that context or --?

16 MR. WATSJOLD: Yes, I would. We went around
17 and around on this about a year ago about management regulations
18 and mitigation options, and I don't think it should be included
19 as a mitigation option.

20 MR. THRALL: Okay, but in that context would
21 you have a problem with it being mentioned at other -- in another
22 part where the Power Authority simply mentions that --

23 MR. WATSJOLD: -- Well, that it be regulated --

24 MR. THRALL: -- that the Power Authority
25 assumes that the Fish & Game will develop a management strategy.

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1 There's a number of places where this sort of similar thing occurs,
2 and I think the Power Authority's intent and thought has always
3 been they don't -- they don't want to infringe, but they at least
4 want to mention it in their discussion or project impacts, not
5 just leave a blank there.

6 MR. WATSJOLD: Oh, yes, that's fine.

7 MR. THRALL: So your problem is more with
8 mentioning it as a mitigation option and --

9 MR. WATSJOLD: -- Right --

10 MR. THRALL: -- say, trying to put words
11 in the Fish & Game's mouth?

12 MR. WATSJOLD: Um-hm, right.

13 MR. ARMINSKI: Leroy?

14 MR. LATTA: In terms of Item Number 1 with
15 the camp sites and trails, I talked to our parks people and
16 generally speaking they're not opposed to it, but by the same
17 token they want to be sure that they're involved in the develop-
18 ment of the plan and that also the Borough trails people be in
19 contact. And any other landowners. But I guess we have condi-
20 tional, you know, okay on that.

21 MR. SUTTLE: And that will be carried through.

22 MR. LATTA: Yes, I assumed it would.

23 MR. WATSJOLD: There may be still some limi-
24 ted opportunity with grayling. Of course, our hatchery that just
25 started has been developing a grayling fingerling. We've never

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1 been able to grow them up past about four or five days. And we're
2 into a research program evaluating how this is going to affect
3 our whole program. Up 'til now stocking grayling out in any waters
4 after they've just hatched (ph) out has been just a waste of fish.
5 And the grayling that we're developing now, it looks like we might
6 have some more opportunities to be able to put them in with waters
7 that already have existing fish in them, like rainbow trout in
8 there. But right now we're just starting off a new program and
9 I'm not sure where it's going to fit into this mitigation option,
10 but it certainly may be a possibility.

11 MR. ARMINSKI: Is there anything else? Any
12 other comments?

13 MR. ROSENBERG: You did -- excuse me. You
14 did have a number down here for a 30-inch grayling.

15 MR. WATSJOLD: Yes, I forgot about that one.
16 It says 30-inch grayling, would really -- really have something
17 there. On Page 3 of that, there's a 30-inch grayling.

18 MR. ARMINSKI: Well, they are trophy, right?

19 MR. SUTTLE: I think that's the one Larry
20 caught.

21 MR. WATSJOLD: Did you let it go?

22 MR. BEDARD: I've caught them 24 inches in
23 that area, though. I don't know about 30.

24 MR. ARMINSKI: I don't see this particular
25 item being addressed through any permits, so I imagine that this

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1 would be part of any overall mitigation agreement that would --
2 we'd submit to FERC. Does anybody have any feelings on that that
3 that's not appropriate?

4 MR. ROSENBERG: One more question on the
5 subject if the inundation of the Deadman Creek falls allowing
6 fish access up into the lake. Will that be discussed under ano-
7 ther issue?

8 MR. GILBERTSON: Yes, that's being discussed,
9 we've got an impoundment mitigation position paper coming up it'll
10 be mentioned in.

11 MR. ROSENBERG: That'll be in that one?
12 Okay.

13 MR. ARMINSKI: Okay, let's move on to F-2.2,
14 this is a discussion of potential changes in pH due to the project
15 and the significance of impacts on salmon and resident fish habi-
16 tats downstream of the dams. Our position is that there won't
17 be any significant pH change and therefore there's no mitigation
18 proposed. Tom Stuart will discuss that.

19 MR. STUART: I think the question about this
20 issue originally came up when we were answering agency comments.
21 Someone asked what the impact would be of flooding acidic bogs
22 in the reservoir inundation area. So what I was trying to do
23 was just a little rough calculation of approximately what the
24 acidic bog area is, and it's less than 3% of the inundation area.
25 And then in the paper we just remind you that it's kind of a basic

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1 tenet, a fundamental truth, that the pH of a system is determined
2 by the geochemistry, the climatology and the hydrology of the
3 entire basin. And if you flood or inundation some acidic bogs
4 the water coming out of the entire drainage still has enough
5 alkalinity to buffer the system within the same pH ranges that
6 it is now. The pH's in the system, according to Fish & Game data
7 and R&M data and USGS water quality data ordinarily range between
8 6 and 8, with a mean of greater than 7 for virtually all the areas
9 of the drainage basin. And we're talking about the alkalinities
10 are almost always in excess of 20 milligrams per liter calcium
11 carbonate, they're frequently 50 to 100 milligrams per liter of
12 calcium carbonate. So we don't expect a pH change.

13 MR. ARMINSKI: Comments? Disagreement?

14 MR. ROSENBERG: No, I have no disagreement.

15 MR. ARMINSKI: Can we drop this thing as
16 an issue?

17 MR. HOSKING: Yes.

18 MR. ARMINSKI: Yes?

19 MR. WATSJOLD: Suits me.

20 MR. ARMINSKI: Okay, good. Okay. Next paper
21 is F-2.3, this relates to heavy metal concentration due to this
22 project in salmon and resident fish downstream of the dam. Basi-
23 cally, our position is that the project will not substantially
24 increase the concentration of heavy metals, although some might
25 be expected to occur. We don't propose any mitigation other than

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1 to monitor the fisheries -- or the fish downstream to determine
2 if there is an bioaccumulation. And Tom Stuart will discuss this
3 one as well.

4 MR. STUART: Again, an examination of the
5 data collected by the USGS and R&M Consultants and ADF&G, it looks
6 like the four metals that are probably a potential to give us
7 any harmful impact would be probably mercury, copper, cadmium
8 and zinc. And of those four, the only one that is really consis-
9 tently known to increase in higher trophic level by a process
10 by bioaccumulation or concentration is mercury. Mercury has been
11 consistently found to increase in fish tissues when you build
12 a new impoundment, so it's only reasonable to expect this will
13 occur here also.

14 We have proposed that this may be a potential happening
15 and that we monitor the fish populations of selected sport fish,
16 probably, for their total mercury concentration in the fish flesh,
17 or perhaps even narrow it down to just methylmercury in the fish
18 flesh. If levels appear to be gaining a concentration in excess
19 of .5 parts per million in fish tissue, I think the only way you
20 probably can mitigate for this problem at the moment is -- that
21 I can think of, is to educate and warn the public that the
22 Environmental Protection Agency recommends that you not eat a
23 considerable quantity of this material, like more than two meals
24 a week, I think it is, of fish flesh that has .5 parts per million
25 of methylmercury in it.

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1 I don't know that it's going to happen. I don't even
2 know that it's a problem right now. We haven't any -- as far
3 as I know we don't have any baseline information about what the
4 mercury concentration is in the fish out there.

5 Another consideration is that it's primarily a potential
6 happening mostly in resident fish. The salmon that most of us
7 are concerned about in this system, of course, are anadromous
8 and they would pick up their mercury concentration in the ocean.
9 They might come back 30 or 40 parts per billion. That's, I
10 believe, what number that I see in the literature for salmon mer-
11 cury concentrations. But the project won't affect the mercury
12 concentrations. The resident fish, on the other hand, that live
13 in the system have a potential to increase mercury, and the poten-
14 tial is unquantifiable. We can't guess about how much it might
15 go up or down with construction and operation of the project.

16 MR. ARMINSKI: Any discussion?

17 MR. SMITH: Is there any way to mitigate
18 if you do have a problem? Is there any way that that material
19 or that metal is exported out of the system? Does it tend to
20 concentrate in certain layers within the reservoir?

21 MR. STUART: I don't think that all the facts
22 are in yet, but a decade's worth of study has shown that there
23 are perhaps two ways to potentially mitigate this problem, that
24 I've seen, anyway, talked about, and one of them has been studied.
25 There's an interesting interaction with selenium. The Canadians

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1 have found that you can potentially possibly add selenium to a
2 system that may be creating a mercury problem and for some reason
3 that it lowers the toxicity level or inhibits the binding of
4 methylated mercury to tissues in higher organisms. It kind of
5 reduces the ability to bioconcentrate mercury.

6 The second method, which has been tried and is successful
7 in point source pollution areas, for example, is to simply cover
8 the area with an inorganic sediment blanket. And that keeps the
9 organic materials that may contain mercury from being cycled back
10 up into the water column and into the biological food chain.
11 We're going to do that, I think, if we build the reservoir. So
12 we think that's a way of minimizing the potential for a problem.
13 We'll have a continuous rain of mostly inorganic sediment.

14 MR. ARMINSKI: Bob?

15 MR. ADLER: On Page 3 you have a whole list
16 of metals that you discounted as being not particularly toxic.
17 By definition, when a parameter exceeds the water quality stan-
18 dards it has an adverse effect on some water quality benefit,
19 whether it be drinking water or aquatic biology. And it seems
20 to me that you have to analyze whether or not any of these sub-
21 stances will exceed water quality standards. And if there's a
22 current violation, whether the violation will be exacerbated.
23 And I don't really understand how you can say they're not parti-
24 cularly toxic when the water quality standards define what's toxic.

25 MR. STUART: What we're trying to do is talk

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1 about the most potential for a problem with these metals. All
2 of the metals that are listed there on Page 3 have been found
3 to exceed on certain occasions the water quality criteria that
4 are listed, I think, by the Environmental Protection Agency and
5 possibly by the state, since they're very similar, and maybe the
6 same. Most of these -- I think you can consider all of them,
7 probably, are naturally occurring in high levels out there.
8 There's no industry, no source that I know of, no point source
9 or spread out source for contamination of that drainage, except
10 placer mining operations, perhaps, way up high in the drainage.
11 This is a naturally occurring phenomenon. I'm really not sure
12 how to address your question. Because it occurs out there
13 naturally, I'm not really sure if it's an existing problem that
14 we would enhance or make worse.

15 MR. ADLER: Well, have you done any analysis
16 to determine whether a violation which is currently either mar-
17 ginal or, as you say, only occasional might become more severe
18 or more frequent?

19 MR. STUART: Only a cursory type of analysis.
20 We have noted that most of these metals are usually found in the
21 particulate phase. They're usually attached to inorganic or or-
22 ganic particulates. And we figured that we will drop ^{70 - 80%} ~~7~~ to 8%,
23 at a minimum, of the particulates that are coming down through
24 the upper drainage in the reservoir. We'll probably not send
25 them through, so we won't be exporting nearly as many metals. But

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1 the lower river, for example, still has the same sediments and
2 the same kind of geology as, basically, the upper part of the
3 drainage, so the metals still exist down there. I don't think
4 the problem will enhance or become greater than it already is.

5 MR. THRALL: Tom, is a part of this question
6 of whether we're talking about these metals in a free ion -- free
7 ionic form or in a bound form and then whether or not they're
8 toxic or harmful in one form or another?

9 MR. STUART: That could be a factor entering
10 it. We've done no analysis to find out exactly what kinds of
11 compounds these metals occur in. We don't know whether they're
12 chelated by organic humic materials or whether they're fast-bound
13 and hard bound to a silicate material of any type. We don't know
14 of any problems --

15 MR. THRALL: We have not been able -- Maybe
16 I -- I don't want to put words -- my understanding is we've not
17 been able to find mechanisms whereby you could conjecture that
18 -- other than the mercury, I think, whether these things would
19 become present in a toxic form due to the reservoir, is that --

20 MR. STUART: That's a fair assumption. We've
21 never found anything yet that indicates any of the rest of these
22 metals except mercury may reach a higher concentration and higher
23 trophic levels. Mercury's the only one out of this list that
24 consistently does that. All of them are potentially toxic. An
25 excess of almost any kind of element is toxic. Too much oxygen

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1 can be toxic too. But we don't know of any problems concerning
2 these metals at the moment, and we don't expect that they will
3 cause -- we don't expect that the project will cause an enhanced
4 problem of any kind with element except perhaps mercury. And
5 we don't even expect that to be a big problem.

6 MR. THRALL: Is that getting to what your
7 question -- I want to make sure we're not talking on two different
8 levels here.

9 MR. ADLER: Well, I think you're tangentially
10 addressing my concern. But bioaccumulation is only one of the
11 concerns in terms of water quality violations on going to higher
12 trophic levels. The high levels of aluminum in a stream can have
13 direct impacts on fishery populations. It's not just a question
14 of bioaccumulation on -- And I appreciate that you don't currently
15 think that there will be exacerbated water quality violations,
16 but my point is that I think you ought to do some quantification
17 on an analysis rather than simply saying there's natural viola-
18 tions now and therefore we don't need to worry about it. You
19 have to understand that water quality criteria are inherently
20 conservative indicators. And a currently marginal violation might
21 not have a measurable impact on a population, but a more severe
22 violation might. And so I think you need to address the possi-
23 bility.

24 MR. STUART: I think we talked about a possi-
25 bility of, if we create a long-term monitoring program, we may

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1 monitor for other heavy metals besides just mercury in some index
2 species, maybe a variety of sports species, like grayling and
3 lake trout and burbot, rainbow trout, something like that. We
4 can add a number of metal analyses to a mitigation program -- or,
5 a monitoring program, for example, if it was necessary.

6 MR. THRALL: Yes, that would be no problem.
7 I think the other part of it may be, as I'm now hearing what you're
8 saying, is that we need to go back and maybe in this position
9 paper formalize a -- we did go through an analysis of sorts that
10 would lead us that we -- looking for mechanisms for any of these
11 other things to become not just bioaccumulated but elevated, and
12 could find none. And maybe we need to go back and formalize that
13 argument in the position paper to demonstrate what our thought
14 processes were by which we came to that conclusion. Is that --

15 MR. ADLER: Yes, I think so. Presumably
16 DEC will be doing some of that analysis in the water quality cer-
17 tification for the project.

18 MR. THRALL: I'm sure. And then the other
19 thing is that certainly there will be on-going water -- both water
20 quality and this monitoring program for the fish -- or, mercury,
21 but there'll certainly be water quality data taken from now into
22 who knows when, through construction and post-project there will
23 be programs, monitoring programs, that will include scanning for
24 all heavy metals. So that will continue.

25 MR. MARCHEGIANI: If there's some type of

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1 analysis that you are particularly interested in having performed
2 or completed that would allay your fears or set a situation that
3 would make you more comfortable with the analysis?

4 MR. ADLER: Well, the type of analysis you've
5 done for mercury perhaps would allay my concerns on -- if you
6 determine what potential for uptake for, say, aluminum is present
7 in the system and what the chemistry of a cumulation of that sub-
8 stance in the stream would be, perhaps that would do it. I'm
9 not a water quality chemist, so I can't suggest what analysis
10 there would be.

11 MR. MARCHEGIANI: You have a general concern
12 that there hasn't --

13 MR. ADLER: -- But I know that --

14 MR. MARCHEGIANI: -- been an analysis made
15 and you'd like to make sure that something has been completed
16 so that your concern is taken care of?

17 MR. ADLER: Well, I know what the law
18 requires, and the law requires no violation of water quality stan-
19 dards for any of these parameters, you can't pick and choose.
20 And I know that the law requires that in order for the project
21 to be licensed you need to get a water quality certification from
22 the state that those parameters won't be exceeded. And, you know,
23 it's up to the chemists and biologists to come up with the data
24 necessary to make that certification.

25 MR. ARMINSKI: Tom?

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1 MR. MEARS: Yes, this is -- this issue is
2 one that I would hope would not be brushed off, as the pH issue
3 was. The explanation that he's used to get to the point of saying
4 that there's little likelihood of any problem is to me unconvin-
5 cing. It does not offer me any assurance at all that the thought
6 pattern is correct there. I also think that the consequences
7 of being wrong in this particular instance alone make it essential
8 that this issue be carried forth and much better researched than
9 it is currently.

10 MR. ARMINSKI: Okay, can you -- Maybe you
11 could relate to Tom the faults in his argument that --

12 MR. MEARS: I'm not -- again, I'll let you
13 all know that I'm not a water -- I'm not that much of a water
14 chemist myself. It's just following the thread of the argument
15 here it's not convincing, the way it sets up. Just because the
16 area's cold and biological rates are going to proceed slowly
17 doesn't in my mind therefore say that concentrations are going
18 to be low. I mean, it seems to me that bioaccumulation's going
19 to proceed at a slower rate to whatever the level it would proceed
20 at a warmer temperature. That's -- Maybe -- like I say, maybe
21 I don't know enough about the process, but that -- but the argu-
22 ment that because bioaccumulation is going to be slow means that
23 it's also going to be low, I have a hard time following.

24 MR. THRALL: There's a couple things. There's
25 always a bio -- there's always mercury, methylmercury being

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1 produced in any system. When you inundate a new area with a lot
2 of organic materials, then you have more organic material to work
3 with and you get an increase -- you can get a dramatic increase
4 where this starts to show up in the system through bioaccumula-
5 tion. A reservoir's essentially an open system, an open ecosys-
6 tem, it's not a closed ecosystem. So if you get this process
7 going on, if it goes on rather rapidly, you'll get -- the concen-
8 trations will go up. Over time any reservoir should, as its
9 organic materials is oxidized, broken down, this process should
10 decrease. What we're talking about here is that it'll never --
11 because of the temperature it'll never get going at a rate fast
12 enough so that you'll notice it to the degree you would if it
13 were very warm water temperatures. At the same time you're cover-
14 ing everything up with silt and essentially isolating that organic
15 material before it has a chance for the bacteria to act on it.
16 That's the thread of the argument. Again, I --

17 MR. MEARS: Yes, the specifics of it get
18 to be curious, though. It's hard to imagine that all these sites
19 are going to be covered with silt, you know, a week after the
20 gates are closed and the river's --

21 MR. THRALL: -- Oh, certainly not a week
22 after, but also within a week's time you're not going to have
23 any --

24 MR. MEARS: -- No, you know, that's what
25 I mean, it's just not convincing to me the way it's presented,

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1 that no harm, you know --

2 MR. THRALL: One other -- just make one other
3 point, and I'm just trying to clarify a little bit of the though
4 process. And that is, again, we're talking about levels possi-
5 bly getting up to where, you know, a regulatory agency would
6 advise you not to eat more than, say, two to three meals of fish
7 a week that you're catching in the reservoir. We're not talking
8 about particularly any evidence that we've turned up in the liter-
9 ature of downstream fisheries effects.

10 MR. MEARS: Is that because the literature
11 doesn't address it?

12 MR. THRALL: It's never been identified any-
13 where as a problem that I know of with any other project. Now,
14 again, we --

15 MR. MEARS: Well, in the Churchill River
16 instance did they go look downstream for mercury or did they not?
17 For mercury accumulation in the fish?

18 MR. STUART: To my knowledge they haven't
19 looked downstream, but that doesn't mean they haven't done it,
20 just because I don't know about it. All they've published at
21 the moment is the enhancement of mercury concentrations in the
22 reservoir.

23 MR. MEARS: Yes, I've read that part and,
24 you know, it's one thing to say that the fish downstream were
25 examined and there were no -- no increase in concentrations, but

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1 it's another thing to say that the literature is void and there-
2 fore that's proof that mercury doesn't move downstream.

3 MR. STUART: Oh, I don't think I said that.

4 MR. MEARS: Well, that's the implication
5 of what's being said.

6 MR. STUART: I think if you were to -- this
7 is my own personal opinion and I can't really validate this or
8 reference it anyplace, because I don't think anybody's done the
9 work. If you don't increase the productivity of the river down-
10 stream, you probably won't see any higher mercury concentrations
11 in fish tissue downriver than you do right now in resident fish.
12 I don't know what's down there right now, I don't think any of
13 us do.

14 MR. MEARS: You know, it's all these pro-
15 bablies that start bothering me.

16 MR. STUART: Well, this is all a probably,
17 it's a potential. So we propose to monitor it.

18 MR. MARCHEGIANI: Tom, just out of curiosity,
19 there's a couple different points to think about. One, if there
20 is a problem, what do we do about it?

21 MR. STUART: Okay, there's --

22 MR. MEARS: Well, I guess what I'm saying
23 is that if -- I would just like to be more assured that we're
24 not going to have a problem, because I agree with you, there's
25 really nothing that can be done about it.

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1 MR. MARCHEGIANI: Right. So I guess --

2 MR. MEARS: And more clearly, then, it would
3 be a -- you know, then we're setting it up to be more clearly
4 a trade-off that society has to say is okay.

5 MR. MARCHEGIANI: Okay, so how about what
6 we do is within this position paper what we try to do is allay
7 your fears, and I don't mean just write it off by any stretch
8 of the imagination, and try to put a little more explanation and
9 analysis in here so that we feel more comfortable and you feel
10 more comfortable with it. Okay, if that's what's there. I mean,
11 I'm not saying that it's going to be one way or the other, but
12 let us take a look at it and try to put something in. The second
13 thing is that you've more or less agreed that there really isn't
14 much that we can do one way or the other, but you want it defined,
15 if that's what the situation is, okay, so that if it is a trade-
16 off that people are aware of the trade-off.

17 MR. MEARS: Yes, I guess I would -- I guess
18 I would feel better if the analysis that was presented here was
19 on the order of complexity as of the ice formation process
20 analyses that you guys did. I thought those were fantastic.
21 I mean, that seemed to be something that I could understand and
22 made sense, and this doesn't.

23 MR. MARCHEGIANI: What we need to do is do
24 a better job of putting pencil to paper so that it's a little
25 more understandable on where we stand.

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1 MR. MEARS: Well, the other thing you've
2 got to consider here is that if this issue is not well resolved
3 at this point, it's one that anybody that wants to oppose this
4 project takes out in and waves back and forth and beats you over
5 the head with forever.

6 MR. THRALL: Just one observation. When
7 you mentioned the ice, this is not -- just to make it clear.
8 This is not something that can be subjected to a mathematical
9 modeling process.

10 MR. MEARS: Just because not enough is known
11 about it?

12 MR. THRALL: It's just extremely complex.
13 Once you try to get into -- believe me, I'm speaking from past
14 experience. Once you get into trying to get into actual biologi-
15 cal systems and modeling biological systems, and not only a single
16 -- you know, where you're getting into microbial systems, what
17 you're doing here, the state of the art does not exist --

18 MR. MEARS: Well, then perhaps it's just
19 as well to assume -- assume that unacceptable levels of mercury
20 will end up in all of these fish rather than no accumulation.

21 MR. THRALL: Well, I'm not -- I don't want
22 to -- We can go ahead and we can do some more analyses and we
23 can -- I think we can maybe give you background and information
24 that will make you feel more comfortable here. But I just don't
25 want to mislead you in that we're going to go out now --

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1 MR. MEARS: -- Yes, I understand, what --
2 what it feels like is because this is a complex process that
3 there's not a lot known about we're going to somehow assume no
4 harm. And therefore no mitigation. And if there's not much known
5 about it and the consequences are severe, as severe as methyl
6 accumulation -- or, methylmercury accumulation in these fish
7 tissues, perhaps that ought to be the stance you take, is that
8 things are going to be loaded with mercury. Just face the facts,
9 buy the project or not.

10 MR. THRALL: Well, except that -- Well, again,
11 we need to go -- our professional judgment tells us that that's
12 probably not necessarily the case, that there will be some bio-
13 accumulation but it's not going to be, you know, "loaded with
14 mercury" in the sense that we're going to have a real serious
15 problem. But we do need to go back and do something with this,
16 I guess.

17 MR. ROSENTHAL: Is it APA's view that --
18 or Ebasco's view that there's no technological way to mitigate
19 for this problem?

20 MR. THRALL: Yes, we think we -- we think
21 there's a natural mitigation. I think of all the arguments that
22 we see that the sediment that's going to be settling out in this
23 reservoir is essentially going to isolate the organic material.
24 Once that's isolated by a few centimeters of sediment, it's essen-
25 tially out of the picture. And we think that that is in fact

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1 the most effective mitigation you could have here. It just so
2 happens we have it naturally occurring.

3 MR. ROSENTHAL: Is there a fallback that
4 you can -- that you can go on now if that does not work out, would
5 that come to be?

6 MR. THRALL: We're not going to go out with
7 a selenium program, I don't think. When you're talking about
8 a project, a reservoir of this size, it's just not -- No, the
9 other thing we're doing is we have a reservoir clearing program
10 which takes out a good part of the organic material. But no,
11 there is no known -- and Tom, you can correct me here, but as
12 -- you know, the selenium has been shown, and I assume that's
13 been in sort of a small scale, experimentally, and we're talking
14 about a very large reservoir, so . . .

15 MR. ROSENTHAL: You're saying there's no
16 known economical way of doing it or technologically it can't be
17 done, which one, the former or latter?

18 MR. THRALL: A little of both.

19 MR. ROSENTHAL: Little of both?

20 MR. STUART: A little of both. I think if
21 you had all the financial resources that you needed, you might
22 be able to slow the process that would naturally occur. It's
23 a process that occurs all over the world, every place that you
24 inundate organic material. It's just something we've become aware
25 of in the last couple of decades, but it probably has occurred

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1 in every reservoir ever built. We just haven't been aware of
2 it, haven't looked for it. There's nothing unique about the
3 Susitna system. You probably could slow it down if we spent an
4 enormous amount of money. You might better spend your finances
5 to find out whether you, A, have a problem to begin with, and
6 then monitor the system to see if you are getting up to ranges
7 or levels that would potentially give you a problem.

8 MR. ROSENTHAL: Well, looking towards settle-
9 ment of this issue, I see it as, you know, possibly in the future,
10 you know, having a sufficient open-ended language in the license
11 itself to allow for monitoring and to require, if it does become
12 a major problem, to require some type of mitigation. I see it
13 as being a concern here, and I'm not familiar with the economics
14 and technology of cleaning this -- you know, cleaning it up if
15 it is a problem. But I see that, you know, there's a concern
16 here for that kind of language in the license, as far as stipula-
17 tions.

18 MR. ARMINSKI: I think we've got to do as
19 well is try and investigate, if there are any practical means
20 of -- other than monitoring and warning people, if there is any
21 way to mitigate this, you know. We're talking about, you know,
22 economics, but it may not even be feasible, even if you did have
23 the money. And I don't think that's anything we've ever assessed
24 here.

25 MR. STUART: Well, the best mechanism that's

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1 been tried on a small scale is to try to blanket the bottom of
2 microcosms with inorganic sediment, ground quartz or something
3 like that, ground silica. Practically, we're doing the same thing
4 when the suspended sediments come down the river and fall out
5 in the reservoir. So we have a -- kind of a built-in mitigation
6 in that respect.

7 MR. GRANATA: How many organics would fall
8 out as well?

9 MR. STUART: You mean how many organics --
10 how many organics are in the -- what's the concentration of organic
11 carbon in the inflowing water?

12 MR. GRANATA: Well, yes, essentially that's
13 what --

14 MR. STUART: I think TOC's on the less than
15 five milligrams per liter total organic material, if I remember
16 right. I could look it up for you real fast, if you really want
17 to know.

18 MR. MARCHEGIANI: Could you put that in per-
19 spective for us?

20 MR. STUART: What five milligrams per liter
21 total organic carbon is?

22 MR. MARCHEGIANI: Right, in relation to --

23 MR. STUART: That's an ordinary concentration
24 for a river like this, or for -- most fairly good-sized rivers
25 that are not in tropical areas. Real clean water would have less

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1 than, say, two milligrams per liter of total organic carbon, in
2 a big lake maybe. A large river of the fifth or sixth order like
3 this one, probably would have anywhere between two and ten milli-
4 grams per liter, quite commonly. So it's not out of the ordinary
5 in that respect. Again, I think this is a potential that needs
6 to be monitored. I don't think it's a problem. I don't even
7 know if it's a problem right now, so that's -- to begin with,
8 we need to go out there and find out if you have any baseline
9 data that indicates there's a problem.

10 MR. HOSKING: Do you have any idea when that
11 would be established?

12 MR. STUART: The baseline?

13 MR. HOSKING: Yes, as we look through here
14 on Page 7 and 10 and so forth, and 8, it talks about the mercury
15 levels in reservoir fish may increase or the mercury levels in
16 resident species below the dam may increase, and there's no indi-
17 cation of any baseline information that you may have.

18 MR. STUART: Well, we don't have any baseline
19 information. I would ask this group -- I've already asked one
20 group about a year ago or seven or eight months ago -- Does anybody
21 know of any mercury analysis in fresh water fish in this state?

22 MR. SMITH: Hank, didn't Pat Winnekins (ph)
23 do some work -- or he wasn't he going to, on the Susitna, even?
24 About a year and a half --

25 MR. HOSKING: I'm thinking Pat's work was

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1 more with arsenic. I don't know, Brad, about mercury.

2 MR. STUART: To my knowledge there hasn't
3 been any analysis of fresh water fish in the state. Now, I talked
4 to a couple of labs about doing the analyses and how they did
5 them. One of them told me they might've done some work two or
6 three years ago, they think, on maybe halibut or some type of
7 marine species.

8 MR. SMITH: Was that Auk Bay?

9 MR. STUART: I'm sorry?

10 MR. SMITH: Was that Auk Bay lab you checked
11 with?

12 MR. STUART: No, that was probably the Fair-
13 banks lab that I called, a commercial lab in Fairbanks and one
14 here in Anchorage. So I don't know of any analyses that have
15 been done for baseline information. I don't know what the concen-
16 trations of methylmercury are in rainbow trout in the Susitna
17 right now, or in lake trout anywhere in the drainage, for example,
18 or dolly varden. I don't think anybody does.

19 MR. HOSKING: Well, I guess in relation to
20 a monitoring program I have some concerns, like Tom Mears expressed
21 over here, is the whole program just going to be dumped on the
22 table and say, all right, we'll monitor and see what happens and
23 is there some assurance from APA that some levels are going to
24 be taken from existing species out there?

25 MR. GILBERTSON: You mean baseline?

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1 MR. HOSKING: Baseline, yes.

2 MR. THRALL: Baseline, yes.

3 MR. HOSKING: Okay, is that going to be done
4 this year, or is this in the program, Larry?

5 MR. GILBERTSON: We're looking at doing it
6 in FY86 right now. It's on the list of things to do.

7 MR. HOSKING: Yes. Okay, I think, then,
8 that it would be appropriate in this paper to include that aspect
9 in there, that there will be some baseline information provided.
10 You've got to have some reason for monitoring out there, what
11 are you going to compare? And maybe you can tell me, I -- again,
12 being one of these non-water chemists, why wasn't arsenic consi-
13 dered in this overall evaluation?

14 MR. THRALL: Tom, do you want to address
15 that?

16 MR. STUART: Yes, I think we addressed only
17 the metals that were listed in the original survey as having
18 exceeded water quality criteria standards, and I don't think
19 arsenic was one of those.

20 MR. HOSKING: Okay, yes, I don't know.

21 MR. STUART: Yes, this is a compilation of
22 a lot of data that was gathered all up and down the Susitna drain-
23 age, from up at Denali all the way down to the Susitna station,
24 mostly by the USGS. And I don't think arsenic was -- either total
25 or dissolved, was listed in the excedence (sic) group.

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1 MR. ADLER: Well, not to kick a dead horse,
2 but the question is not whether the level is currently in excess
3 of water quality standards, but the question is whether the dam
4 construction and operation is going to result in increased levels
5 of any of these parameters. And Tom, you asked what the flaw
6 was in the analysis, and the point is that there is no analysis
7 of those parameters. There's nothing to critique, it's just a
8 one-liner.

9 MR. MARCHEGIANI: I'd like to get a feeling
10 from you. What happens if we go out and we monitor it and we
11 do this analysis and we find that the levels of whatever it be,
12 arsenic, calcium, whatever, is the same, basically, with the
13 natural conditions as with the project, but they exceed the water
14 quality standards?

15 MR. ADLER: I don't -- I don't know what
16 the legal answer to that question is. I would suspect that if
17 the project is not increasing the levels you wouldn't ultimately
18 have a problem with the court. But on -- there's probably no
19 NPDES permit requirement, but that doesn't exempt the project
20 from the requirement to comply with water quality standards.

21 MR. MARCHEGIANI: The implication of what
22 you're saying is that the project has to enhance the natural con-
23 ditions to meet the state water quality criteria?

24 MR. ADLER: No, I didn't say that.

25 MR. GILBERTSON: No, I don't -- that's not

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1 what he's saying.

2 MR. THRALL: Well, okay, I just --

3 MR. ADLER: But if it exacerbates a current
4 violation, then there might be a problem, and you might need to
5 have mitigation measures.

6 MR. MARCHEGIANI: Well, what I'm --

7 MR. ADLER: Or in absence of mitigation mea-
8 sures, as Tom Mears says, you have to at least identify the pro-
9 blem to the public as a potential unavoidable aftereffect of the
10 project.

11 MR. MARCHEGIANI: I understand that, I have
12 no problem with that. But I guess the problem that I have is
13 that if we have a with project condition that exceeds the stan-
14 dards in its present state, okay, and then we actually have a
15 project that does nothing to the water quality, it stays the same,
16 doesn't increase it, doesn't decrease it, the project -- at least
17 according to the law and by -- the implication that you're saying
18 when you say just because the water quality standards are, in
19 a natural state, are violating the standards, that the project
20 has to turn around and deal with them. Okay, the implication
21 is basically is that the project has to enhance the natural water
22 conditions to a level that meets the water quality parameters
23 that the state has set up.

24 MR. ADLER: That's not what I said. I said
25 that you may have a marginal or intermittent water quality

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1 violation which the project might make worse or more frequent,
2 and if that's the case, you need to address the problem. And
3 you need to analyze whether or not that's going to occur.

4 MR. MARCHEGIANI: Okay.

5 MR. THRALL: Just as -- My understanding
6 is that we need to go back and we need to do some additional ana-
7 lyses or really put on paper what we've, I think, already done
8 in terms of other -- say, other metals that were not included.
9 Again, I'll emphasize, we did go through an analysis in our minds
10 and we dismissed those that we thought the probabilities were
11 essentially zero to have a problem. But we need to go back and
12 put that into a written analysis. And we also, I guess, need
13 to go back and look at our methylmercury analysis and see if we
14 can't bolster that. And again, I'd like to emphasize that in
15 our minds professionally we see very little probability of any
16 problem, but want to emphasize that you cannot prove in a rigorous
17 scientific way -- you cannot prove this. You can certainly demon-
18 strate it very strongly, and I think we can go back and maybe
19 strengthen our demonstration.

20 MR. MEARS: The thought occurs to me that
21 if that's the case, experience in other areas shows that I can
22 probably go find half a dozen experts that will draw the opposite
23 scenario for me, if I'm willing to go look for them.

24 MR. THRALL: I'm sure I can find a number
25 of experts to prove a lot of different things. But again, I

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1 personally would say that we don't have a big problem here, and
2 I think we can put together a case and I hope -- hopefully, then,
3 we can go through this one more time and approach a resolution.

4 MR. SMITH: Jim, because a lot of us here
5 aren't water quality experts or chemists, and because at least
6 our agency is going to look towards EPA and DEC before we sign
7 off on this, could you somehow include them in this evaluation
8 before -- so we don't have to go through this again?

9 MR. THRALL: Sure. But I say just again,
10 ultimately I think they are the -- I mean, DEC, to me, is the
11 agency that will, in a sense, resolve this issue. Because I think
12 it falls within their purview. Tom, is that right?

13 MR. ARMINSKI: Yes, that's correct.

14 MR. THRALL: And so, in a very sort of legal-
15 istic way, you know, that issue becomes resolved. Certainly not
16 -- we can't say it will become resolved, say, in the public's
17 mind. And we would rather resolve it completely in the public's
18 mind and not to run it through a permitting process and have other
19 people out there saying, wait a minute, we don't believe this.
20 But that's the -- that's sort of the ultimate resolution from
21 a legalistic point of view.

22 MR. ARMINSKI: I guess we could, you know,
23 work with them closely to -- you know, to go through this reiter-
24 ation of this and see if we can satisfy their concerns. "Their"
25 being the agency that's most directly responsible for this. And

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1 I sense that what you're saying is while you have an interest
2 you don't have a good understanding and it isn't within your
3 statutory purview to address this directly, but --

4 MR. SMITH: It's not within our area of
5 expertise, I think that we -- yes, we arguably could and will
6 comment to it, but there may -- these type of concerns may be
7 very easily resolved, it's just we don't know that much to do
8 it. And I don't like the idea of fractionalizing the whole pro-
9 ject by saying, well, it's ultimately going to be certified by
10 DEC so, you know, it becomes something of a nonissue or a lesser
11 issue.

12 MR. ROSENTHAL: We don't suggest deferring
13 completely to DEC, just that you gain their insight. And I don't
14 know how much of your -- that has been done in this paper, if
15 any at all. Has DEC commented at all on any of this?

16 MR. ARMINSKI: No, and I don't think anyone
17 is here from DEC today. It's unfortunate.

18 MR. THRALL: The only thing, I guess we have
19 a negative comment in that sense, that they haven't, you know,
20 said anything directly about it.

21 MR. MARCHEGIANI: I think, Tom, there's one
22 other thing that we need to have resolved or discussed would be
23 -- and that is what happens in a place where there are natural
24 conditions that exceed the parameters and let's say if the project
25 does come in in the same area. I don't know what the general

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1 feeling of the people are in the room. My feeling is if it's
2 sitting there naturally, okay, and the project doesn't increase
3 it and doesn't diminish it, then we haven't changed anything,
4 and it's status quo. DEC may not view it that way, and I don't
5 know exactly what the situation could be, but I think, you know,
6 we're discussing issues and issue papers here, and as far as I'm
7 concerned that's one of the most critical questions there is,
8 because I don't see an easy to mitigate -- I mean, how do you
9 decrease these levels? You know, what do you do? And I don't
10 know, nobody's -- everybody says that there's a problem, but
11 nobody's saying that there's a solution or a means to a solution
12 here. And, you know, I'm open to listening, but it doesn't sound
13 like anybody's meeting the issue head on, because that's what
14 the issue really is. If we exceed that standard, what does it
15 mean?

16 MR. ARMINSKI: Well, I guess -- you know,
17 I guess there's problems and there's problems, and, you know,
18 one is from a biological perspective and the other's from a legal
19 perspective, and I know we've gone around in-house about these
20 things for quite some time and recognize that we're going to have
21 to deal with the legal side of it.

22 MR. MARCHEGIANI: Well, I just think it's
23 something that, you know, is a part of this whole thing, and,
24 you know, people need to start thinking about it. It is an issue.

25 MR. ROSENTHAL: From what I -- from what

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1 I see, I don't think it's the status quo that's the problem.

2 People are wondering what if it's exacerbated by the project.

3 MR. STUART: I think that's a good point.

4 We haven't said it is a problem, I'm not saying that at all.

5 It's just a potential.

6 MR. ROSENTHAL: Potential problem.

7 MR. STUART: Of all the metals listed that
8 were high, the only one that is known to be exacerbated, the only
9 problem that can be exacerbated, so far as I know, by an impound-
10 ment, is the possibility of changing mercury to an organic form
11 and having it bioaccumulate in higher trophic levels.

12 MR. ROSENTHAL: And if it is exacerbated,
13 there may need to be a solution to it. I don't -- you know, if
14 you say there is none at this point that you've addressed, there
15 may -- may need to be one. I don't know.

16 MR. BEDARD: I have a question. Would a
17 large amount of mining operations on the tributaries contribute
18 to this metals disturbance?

19 MR. STUART: Not necessarily.

20 MR. BEDARD: The reason why I'm saying that
21 is recently the Denali planning block opened up that whole area
22 to mining. And there's a lot of small miners in there that are
23 doing a lot of land disturbance. Back in the 1890's to about
24 1920 the Valdez mining district was using a lot of industrial
25 mercury in those tributaries that feed into the Susitna, and some

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1 of that -- I'm not sure that some of that mercury, high mercury
2 content, could be still coming from that old industrial usage,
3 like it is in -- out at Portage Creek area and the Ericson mine.
4 There's still a lot of mercury in that stream, actual industrial
5 mercury. You can dig it up in your -- when you're digging for
6 gold and you find mercury in the sediments under rocks that was
7 used in processing. I'm just wondering if some of that mercury
8 could have been the cause of that.

9 MR. STUART: Frankly, looking at the liter-
10 ature values for reported mercury in rivers, concentrations that
11 are found in the Susitna are not particularly high. They're on
12 -- they're on the -- oh, probably in the lower third of the middle
13 range of world river concentrations of mercury. They're not really
14 super high. And secondly, the amount of mercury that's in inor-
15 ganic form, which is the measure that has been talked about here,
16 is not the cause of the problem. That's not even -- it's just
17 faintly related. The whole problem arises when bacteria and fungi
18 methylate, or microorganisms methylate the mercury found in or-
19 ganic material in the process of using it for fuel. And that
20 methylmercury can be concentrated by factors as high as 60,000
21 inside of fish tissue. The reason why it's concentrated in higher
22 vertebrates like fish is because there's no natural mechanism
23 to remove it from the fish very fast. It goes in much faster
24 than it can be excreted by the fish, so it builds up, he concen-
25 trates it in his own body. Human beings then eat fish and they

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1 can concentrate the mercury in their bodies. Since there's no
2 good mechanism to remove the mercury from our bodies or from the
3 fish tissues, it can accumulate to a problem where there are sub-
4 lethal or even lethal effects. But the amount of mercury that's
5 in the drainage is not an indicator of a potential problem. Even
6 if it was twice as high or three times as high as it is right
7 now, it's not necessarily an indication of that there may be a
8 mercury bioaccumulation problem in fish.

9 MR. THRALL: This is obviously something
10 that needs -- the resolution of the day is that we go back and
11 work on this some more. Does that pretty much summarize it?

12 MR. ARMINSKI: Yes. If there's nothing else
13 on this, why don't we take 15 minutes, get a cup of coffee.

14 (OFF RECORD)

15 MR. ARMINSKI: The next paper is F-2.4, that's
16 the significance of potential changes in dissolved gas on salmon
17 and resident fish habitats and population downstream of the dam.
18 Our position is that the mitigation measures proposed will reduce
19 or maintain the gas concentrations at or below existing levels,
20 and that there will be no detectable effect on the aquatic
21 resources. Larry, are you going to -- Tom?

22 MR. STUART: Here again, the data that we've
23 used to look at this system was generated by the ADF&G group,
24 the Su Hydro group, Dane Smith and his colleagues. They have
25 found that dissolved nitrogen gas can be supersaturated in the

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1 water passing through Devil Canyon, apparently by natural causes.
2 The concentrations appear to be linearly related to the discharge.
3 The higher the discharge, up until at least 32,500 cfs, the higher
4 the amount of supersaturation. Beyond that I don't think we really
5 know exactly what would happen in terms of supersaturation. The
6 basic thrust of our idea here is that the project will reduce
7 the peak or amplitude of flood flows and will reduce the frequency
8 of flood flows through Devil Canyon. By doing both of those,
9 you probably will -- you definitely will lessen the amount of
10 supersaturation that's created by passing through Devil Canyon.
11 There is one mitigation mechanical means which has been incorpor-
12 ated into the project preliminary designs at this stage, the cone
13 valves, which will be used for releasing controlled releases,
14 are placed in the dam so that you can release lots of water in
15 a spray-type of discharge and not have a plunging effect that
16 may cause additional supersaturation. So by operating the project
17 in the manner that has been proposed, limiting the peak flows,
18 retarding the amount of floods that go through Devil Canyon, and
19 using cone valves as discharge mechanisms, we think that we can
20 keep any supersaturation at or below levels that exist now. And
21 I would remind you that Fish & Game has been out there quite a
22 number of years and quite a number of observers, and they have
23 not found any detrimental effects, to my knowledge, anyway, due
24 to gas supersaturation in any of the fish species out there.

25

MR. ARMINSKI: Any discussion? Brad?

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1 MR. SMITH: A couple of things. The -- while
2 natural conditions can apparently go to 115, 116%, if there was
3 spillage given a -- I don't know what a reasonable flood event
4 would be, maybe you can tell me, what levels could be expected
5 to occur downstream? It's kind of analogous to the mercury thing.
6 Even though we have background conditions that -- or, existing
7 conditions that do exceed saturation levels, where I'm talking
8 115, 116%, what could we expect with a major spillage?

9 MR. STUART: Well, the project has the capa-
10 bility of stowing and slowing releasing all floods less than the
11 50-year flood, if I'm not mistaken. And the maximum discharge
12 from the turbines and cone valves together, I think, from Devil
13 Canyon in the two dam scenario would be about 38,500 cfs, I
14 believe. That's the most you would get, and part of that would
15 -- only about 31,000 of that, approximately, would be going through
16 Devil Canyon, where most of the gas saturation problem occurs,
17 in the lower part of it. Another 7,000 of that 38,5 would be
18 exiting via the turbine tailrace and would enter the river under-
19 neath the surface of the river down below Devil Canyon, it would
20 by-pass the canyon rapids. So the maximum you might expect in
21 terms of water flowing from the system through the real problem
22 area is about 31, 32,000 cfs.

23 MR. SMITH: Well, what about water over the
24 spillway during the spill?

25 MR. STUART: Well, that would be an

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1 exceptional event, we think.

2 MR. SMITH: Yes, that's what I was -- that's
3 what I was asking for, during the -- because the -- I mean, there
4 was some alternatives with the spillway design, the cascade, the
5 flip-up and suction (ph), and those were deleted or dropped.
6 And so I'm assuming that whenever you do spill, you're going to
7 have a little worse problems than you -- it was a design consider-
8 ation or option earlier to design that spillway to mitigate for
9 dissolved gas.

10 MR. STUART: I'm not sure what -- are you
11 asking what the discharge might be under a -- say, a 100-year
12 flood? What is the maximum discharge?

13 MR. SMITH: What would the resultant gas
14 levels be with a major or a normal spill event where you actually
15 had to discharge in excess of the 38,5? I don't know how much
16 you would spill during a given event, whether it'd be, you know,
17 10,000 cfs over the spillway, 5,000?

18 MR. STUART: I couldn't tell you because
19 I don't know what the discharge might be, and I'm not really sure
20 in my own mind what would happen if you put more than, say, 32,000
21 cfs through Devil Canyon. Eventually you might get -- if you
22 increase the discharge, say, up to 40 or 50, 60,000, you may not
23 see a linearity of supersaturation increasing with increasing
24 discharge. It may not do that at all with high discharges.

25 MR. SMITH: You think it would flatten out

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1 or you mean it would get more -- like exponential?

2 MR. STUART: May flatten out, probably.

3 I don't think there would be the turbulence in the plunge pools
4 if you were running 50,000 cfs through there, maybe, or 60 or
5 70. But I'm not sure of that, I don't know the answer to your
6 question. Some examination has been done, however, of the K rates.
7 I think at 16,000 cfs and 30-some odd thousand cfs of flow at
8 Gold Creek, Dana and the Fish & Game crews have examined the decay
9 rates of supersaturation, and they've found that with about a
10 20-mile downstream flow you'll reduce your supersaturation from
11 whatever it was at the bottom of Devil Canyon to about half of
12 that within 20 miles. If it was 110% coming out of Devil Canyon,
13 20 miles later downstream you'd probably lose down to 105%.

14 MR. SMITH: Still, that's dependent on what
15 the initial concentration was, right? The decay rate is --

16 MR. STUART: It's dependent on the percent.
17 You know, it's dependent on turbulence and temperature and the
18 volume of water and a lot of things. But it appears to be --
19 within the realm that we're talking about for discharging most
20 of the time on the project, it appears that 50% of it will be
21 lost upon about 20 miles of downstream travel.

22 MR. THRALL: Brad, you're asking, I think,
23 basically what the supersaturation levels might be when the pro-
24 ject does spill, right?

25 MR. SMITH: Maybe like a worst case analysis.

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1 MR. THRALL: A worst case. And I think we'll
2 have to go to the -- maybe go to the -- the best source of infor-
3 mation here is going to be going to the literature, looking at
4 existing system, and include that information in the position
5 paper.

6 MR. ARMINSKI: Let me ask Gene a question.
7 Is that something that we could model, based on depth of plunge,
8 whatever, from spillway discharges? Is the --

9 MR. GEMPERLINE: I think that would be rather
10 difficult. We could get some idea from that. But again, you
11 can even do things to the spillway, you know, to -- a lot of it
12 depends on the shape of the spillway flip bucket, and I don't
13 think it's readily modelable. You can get an idea of what kind
14 of plunge you might get and say -- but, you see, that's not even
15 a -- it's not even a normal case that you'll get a spill, you
16 know.

17 MR. THRALL: I think what we can do is take
18 a look, do some back of the envelope calculations and go -- maybe
19 go and look in the literature and report ranges of values that
20 have occurred at other projects and report back. Is that --

21 MR. SMITH: Yes, I'd be interested. With --

22 MR. MARCHEGIANI: Could you specify, Brad,
23 you're asking a real hard question. First of all, that -- what's
24 a normal spill? Well, as far as we're concerned, we don't want
25 any spills, because every ounce of water that goes out of that

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1 -- over that spillway doesn't generate electricity. Okay, and
2 if you've ever worked for a power company, the very first thing
3 that they do is they try to make sure all the water stays in the
4 reservoir. So can we go based on the assumption of a 50-year
5 flood is basically what the reservoir will hold, can we assume
6 that what you would like to look at is a 100-year flood and what
7 would happen -- what would pass out of the reservoir given, let's
8 say, a 100-year flood? See, what it boils down to is it's hard
9 for us to turn around and say, well, you know, what do you want
10 to look at? Do you want to look at a 100-year, 200-year, 500-
11 year?

12 MR. SMITH: Well, we had -- what did we have,
13 a 500-year event a few years ago? So I don't know what might
14 be reasonable. A 100-year event would be more information than
15 we have now, as far as -- I don't know what we're comparing.
16 Normally it sounds like a very good argument to say, well, we
17 have supersaturation conditions now in Devil Canyon and we're
18 going to make it better, and I think that argument is logical
19 when you're considering the cone valves and the nature of the
20 project below the 50-year flood event. But above that, you know,
21 I -- there's really nothing to say what would happen. And even
22 though without the dam you'd have, with that type of event, 500-
23 year event, you'd have very, very high levels, I don't know --
24 you know, maybe Tom's point is correct, that that is kind of
25 linear, but now it's going to be spilling -- it's going to be

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1 dropping 600 feet, or whatever the height of the spillway is.

2 MR. THRALL: Gene, when we spill on one --
3 say, one in 50 or above floods, the cone valves and the --

4 MR. GEMPERLINE: -- The cone valves --

5 MR. THRALL: -- turbines will be operating
6 so whatever it is --

7 MR. SMITH: -- I realize that --

8 MR. THRALL: -- on the spillway is diluted
9 by, you know, whatever factor.

10 MR. GEMPERLINE: There is some feeling that
11 you can put a certain amount of flow through that -- through that
12 spillway and not increase the supersaturation at all. So --

13 MR. ROSENBERG: In the executive summary
14 on the third page on the last paragraph of the -- last sentence
15 of the first paragraph it says, "Dissolved gas concentrations
16 under high flow conditions with the project are expected to be
17 no higher than those which may occur under natural flood condi-
18 tions without the project." Is what we're kind of talking about
19 now -- I get the feeling that there's nothing that supports that.
20 What supports that statement?

21 MR. THRALL: I'm not --

22 MR. ROSENBERG: The statement says that
23 "Dissolved gas conditions (sic) under high flows -- under high
24 flow conditions with the project are expected to be no higher
25 than those which may occur under natural flood conditions without

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1 the project." You know, what's that based on?

2 MR. THRALL: Well, it's based on what the
3 flow coming out of the turbines and the cone valves and the fre-
4 quency and severity of floods. I mean, that -- all those things
5 combined would indicate that you're decreasing -- maybe the wording
6 is a little bit less clear than it should be on that. But the
7 intent is that on -- you know, on a year-in, year-out basis you're
8 going to have less frequent floods, you're going to have less
9 severe floods, and you're going to have these floods passing
10 through the turbines and through the cone valves so that you won't
11 significantly increase gas concentrations.

12 MR. ROSENBERG: Yes, but what about what
13 we were just talking in reference what we're talking about now?

14 MR. THRALL: We need to -- we maybe need
15 to reference again the one in 50 or greater event to put some
16 level of the supersaturation expected out of that. Now, obviously
17 when you get up to the one in 200 or one in 300-year flood, and
18 if you open the spillway up, you're going to have relatively high
19 levels of gas supersaturation from that spillway flow. Now, what
20 that would be in terms of what that same flood coming down the
21 river -- that's a real problematical thing.

22 MR. ROSENBERG: Well, this implies to me
23 that you know the answer to that, I guess.

24 MR. THRALL: I think the wording is some-
25 thing we need to qualify that statement. But we can put down --

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1 Brad, let's say that we'll look at a one in a 100-year flood and
2 do some calculations and we can give you a feeling for what that
3 would be. Would that satisfy what your concern is there?

4 MR. SMITH: Yes, it would. The flow discharge
5 data that was in the license application and the Exhibit E, is
6 that -- has that changed with KC6? Is the reservoir operations
7 model still the same?

8 MR. THRALL: Frequency of spills?

9 MR. SMITH: And the flood storage and all
10 that.

11 MR. THRALL: It's the same.

12 MR. SMITH: The same.

13 MR. GEMPERLINE: No, actually it's better.
14 There was -- in the reservoir operations for the KC there was
15 a period when Devil Canyon first came on line when there was a
16 -- there would've been a need to open the spillways, and that
17 occurred for -- it was either 1964 or 1967, which had a peak flow
18 which exceeded the 50-year flood. I think it was something like
19 the sixty -- statistically, the 65-year flood. That doesn't hap-
20 pen anymore. The more recent simulations that we've done with
21 E6 show that you don't have to open the spillways at all for those
22 34 years of record. So we've actually done a little bit better
23 than 50-year flood.

24 MR. SMITH: How sensitive is this going to
25 be, or the position statement going to be to the final flow

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1 negotiated release?

2 MR. GEMPERLINE: I think what we're -- I
3 think actually we would design to prevent the supersaturation
4 from the 50-year flood. I think that's the --

5 MR. SMITH: So you're not constrained by
6 any particular flow that might eventually be --

7 MR. THRALL: There are things -- there are
8 minor modifications we could do in design --

9 MR. GEMPERLINE: -- Yes --

10 MR. THRALL: -- if it turned out to be neces-
11 sary. I don't think we see that that -- Probably what will happen
12 as you get further and further into this flow regime and defining
13 it more and more, you'll find that you're better able to handle
14 these flood flows. When you start out an analysis like this you
15 make some very simplified assumptions about how the project will
16 be operated. And as you get more data and more analysis, your
17 assumptions become more sophisticated, and the tendency is to
18 store water when you can and waste water only when you have to.
19 So the frequency of spills should go down.

20 MR. GEMPERLINE: Especially as the project
21 matures and there's more and more need for power generation there's
22 going to be less and less possibility of spill. And that's --
23 actually that's evident from -- even from the KC and the KC6.
24 What we were talking about, I believe, was a one in 50 chance
25 in the early years of the project. That doesn't happen later

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1 on.

2 MS. GORBICS: Going back to what Tom said,
3 too, about whether or not the impacts would increase exponentially
4 or level off or end up in a linear fashion. It seems to me that
5 even if we look at just the 100-year flood we won't get a feel
6 for that, so maybe looking at a couple instances of spillway use
7 to get an indication of whether -- how it does increase. If we
8 could do that.

9 MR. STUART: Some consideration of this ques-
10 tion has gone back and forth between myself and Don Byer and some
11 other people in the process of formulating some ideas for a long-
12 term monitoring program. I recognize that there may be some data
13 gaps. I don't know that we have any supersaturation measurements
14 or gas saturation measurements at flows higher than 32,500 cfs
15 at the moment. We may continue to monitor something like that,
16 perhaps, if we need to, to try to monitor a big event, like 50,000
17 cfs through there, or 90,000. We might be able to catch that,
18 I don't know.

19 MR. THRALL: Talking to the helicopter pilot
20 who used to hover above Devil Canyon --

21 UNIDENTIFIED: -- Not a wise idea --

22 MR. THRALL: -- Yes, well, we aren't going
23 to collect any more data above that.

24 MS. GORBICS: Well, I wasn't even thinking
25 of that, but just modeling to -- you know, if you can model a

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1 100-year event, you should be able to at least do a --

2 MR. THRALL: The further out you get there
3 the more problematical things get. We could do it, but also then
4 you get into the problem of you're talking about a 500-year event
5 or a 1,000-year event, and supersaturation becomes sort of a moot
6 point in terms of any habitat effects. If you're talking about
7 that big a flood, your fish are not going to be worried about
8 gas supersaturation.

9 MR. GEMPERLINE: Actually, the -- maybe the
10 benefit that comes there is that you are really reducing the peak
11 flow from that quite a bit.

12 MR. THRALL: But again, it can be done.
13 We can take a look. I would hesitate to say right now what --
14 it's maybe something to be discussed on our next meeting under
15 old business, but in terms of the time and effort and whether
16 we see a return, we can certainly look at it and report back.

17 MR. MARCHEGIANI: I think our general feeling
18 is is that everything that we're going to do should improve the
19 situation. And you may not totally agree with that, but we're
20 saying -- well, what it says in here is that you're going to
21 improve it, you have nothing to back it up. But if you just think
22 about what's happening, if there was no dams there, okay, and
23 then you had a 100-year event, you would have probably in excess
24 of 117, maybe 120%. At least the information that Dana's collec-
25 ted with the helicopter pilot was running around that area. And,

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1 youknow, it was difficult to collect the information, period.
2 Okay, if we turn around and build the reservoir, we're going to
3 flatten that curve, so immediately as far as habitat goes your
4 habitat survival is a lot better. We release up to the 50-year
5 flood through the cone valves, which decreases supersaturation,
6 and also through the turbines. So that automatically makes things
7 better, just by doing that in itself. Now, let's say if we exceed
8 the 50-year flood, well, then, yes, you have a certain amount
9 that goes down over the spillway, that'll be diluted with what's
10 actually going through the powerhouse, the general inkling is
11 that you improve the situation. Outside of some hard and fast
12 numbers, I don't know how else to put it that, you know, with
13 the reservoir in all likelihood you're going to have a better
14 situation than if you don't have the reservoir.

15 MR. SMITH: I think we'd agree with you and
16 have -- you know, we're very appreciative of the cone valves and
17 recognize that they're going to do a lot to mitigate against the
18 problem. Normally I think things will improve. But there is
19 -- you know, say it's 10 cfs going over that spillway. I don't
20 know, even given the dilution factor, what -- what that really
21 means in terms of comparison with what's there naturally. And,
22 you know, we're not going to license the project on an inkling
23 or something. You know, just --

24 MR. MARCHEGIANI: So what your real concern
25 is what -- how much discharge goes over the reservoir and what

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1 that means as far as -- over the spillway and what that means
2 supersaturation-wise?

3 MR. SMITH: Yes.

4 MR. MARCHEGIANI: And that's really the issue
5 that we should address?

6 MR. GEMPERLINE: We would have nothing to
7 compare it against in a natural condition. So we couldn't say.

8 MR. MARCHEGIANI: Well, we could tell you
9 maybe what it means, I mean, as far as supersaturation, but I
10 think that -- what you're saying, Gene, is we don't have a back-
11 ground?

12 MR. GEMPERLINE: No, we don't have anything
13 under natural conditions for flows in excess of 30,000. You know,
14 if you had 120 -- or, 100,000 going down Devil Canyon, what are
15 your -- what are you going to get in terms of nitrogen saturation?
16 How can I -- I can't compare what comes out of that spillway with
17 what might happen under a natural condition.

18 MR. STUART: I don't know of any way to model
19 what you're talking about.

20 MR. GEMPERLINE: Yes, there's no way we could
21 model Devil Canyon and find it. If we assumed it were a linear
22 relationship, we'd get 150% in Devil Canyon.

23 MR. STUART: But it might not be.

24 MR. GEMPERLINE: But it might not be. But

25 I mean, we don't really know --

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1 MR. SMITH: That's measuring the flows at
2 Gold Creek, or the concentrations at Gold Creek and back calcula-
3 ting? Or figuring what -- using your --

4 MR. GEMPERLINE: No, that's --

5 MR. GILBERTSON: Just using your linear rela-
6 tionship that we have from the observations that Su Hydro made.
7 It's just continue that linear relationship out to, you know,
8 whatever flow at Gold Creek.

9 MR. SMITH: I do see the problem. At the
10 same time the information would be interesting, if nothing else,
11 to just see what theoretical levels might be realized by the pro-
12 ject. I mean, we can compare that against the literature and
13 see -- I realize we may not ever have a background condition at
14 those flows to compare against.

15 MR. THRALL: Well, again, we could -- I think
16 if we take a certain assumption and say let's -- we'll look at
17 the 100-year flood, again realizing that if you -- if you had
18 a flood that you just had to sort of crack the spillway, you had
19 the turbines going, the cone valves going, and you just cracked
20 the spillway so you'd have a very thin sheet flowing out, I think
21 the thought is you'd have no supersaturation --

22 MR. GEMPERLINE: -- That's right --

23 MR. THRALL: -- from the spillway, because
24 you wouldn't have enough going over. So you have to pick some
25 point where you'd get a fair volume of water going through the

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1 spillway.

2 MR. SMITH: Does it actually need a plunge
3 pool to enter -- to generate the --

4 MR. GEMPERLINE: No, it's the plunge -- it's
5 the depth of the water -- the depth of the jet of water below
6 the surface of the tailwater. It doesn't -- doesn't need a plunge
7 pool. That commonly is called the plunge pool area, but it
8 doesn't necessarily -- in fact, you won't have a plunge pool there.

9 MR. SMITH: Cascading on the rocks you
10 wouldn't have any problem?

11 MR. GEMPERLINE: Yes, you could.

12 MR. SMITH: You could.

13 MR. GEMPERLINE: But you're not going to
14 have cascading on the rocks. You're going to have flow into the
15 -- into a tailwater pool, which is not a plunge pool, so to speak.
16 Plunge pool is an area of the riverbed which has been excavated
17 either ahead of time or by the action of the water.

18 MR. MARCHEGIANI: I guess so far our position
19 for that, you know, we took the investment of whatever it is,
20 \$80 million, for mitigation costs to put the cone valves in because
21 we feel that it's important we protect up to a 50-year flood,
22 and our feeling is that that's going to be adequate to deal with
23 the situation because we don't want to spill that water, period.
24 We want to generate electricity with it. And that mitigation
25 measure, we feel, is a substantial investment into the process

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1 and as a mitigation measure should be adequate to take care of
2 supersaturation.

3 MR. ARMINSKI: Can we go on to the next paper?

4 MR. THRALL: Okay, so we've just -- before
5 we go, I just -- we'll include that information in our next go-
6 around. We'll do our best to put in an analysis and shoot it
7 by you one more time. Is that --

8 MR. STUART: Shall we pick a 100-year flood,
9 for example?

10 MR. THRALL: Would a 100-year -- well, let's
11 say -- I think we need to look, Gene, at what a 100-year --

12 MR. GEMPERLINE: -- Yes --

13 MR. THRALL: -- might be in terms of a split
14 between cone valves and turbines.

15 MR. SMITH: Yes, I'm comfortable with a 100-
16 year flood. Now, your point was probably well taken, but it kind
17 of makes sense to me that -- you know, looking at everything else
18 with the larger events, there's not much sense in --

19 MR. THRALL: That's -- I mean, we can do
20 the analysis. My feeling is you'd start to get up in the very
21 high floods -- in the first place once you get --

22 MS. GORBICS: When you pointed that out to
23 me, that made a lot of sense. Yes.

24 MR. THRALL: The other thing is how --

25 MS. GORBICS: -- I'm comfortable with that --

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1 MR. THRALL: -- how realistic -- once you
2 get up past a 100 or 150-year flood event, it becomes sort of
3 a statistical game whether those are real events or not. So I
4 don't know, that's a hydrologist's -- I mean, that's just my
5 impression. When you talk about a 10,000-year flood, I mean,
6 you're talking about things that occur on the same frequency as
7 the ice ages, and there's really not much use to --

8 MR. SMITH: -- And this -- this isn't a basic
9 problem we have with this -- this issue. You know, it's just
10 kind of cleaning up to get it off the --

11 MR. THRALL: I understand, that's -- and
12 I think we can accommodate that without too much problem.

13 MR. STUART: Yes, I think we can work on
14 that and probably add that.

15 MR. ARMINSKI: The last paper, F-2.5, this
16 is the significance of changes in water temperature on salmon
17 and resident fish habitats and populations downstream of the dam.
18 We suggest some mitigation measures in here, and it's our position
19 that by employing these measures the potential impacts will be
20 insignificant. Larry, I guess --

21 MR. GILBERTSON: Yes, we did a -- we did
22 an extensive literature review to establish temperature ranges
23 within which the species were able to carry out certain behavioral
24 or life history performance. We tempered these literature values
25 with actual observations in the Susitna where that was appropriate.

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1 Then we modeled or simulated pre- and with-project temperatures
2 under a wide range of hydrological and climatologic conditions,
3 a range that we felt would bracket the conditions that you would
4 expect to find. And we compared then projections of with-project
5 water temperatures to the temperature ranges for the species for
6 each behavior or life history component that we wanted to look
7 at. And in doing that, we found really no cases where we felt
8 that there was a real disastrous kind of a problem. There were
9 some cases where the projected temperatures did approach some
10 limit of observed temperatures from the literature or from the
11 Susitna. An example that we mention in the position paper was
12 chinook migration. But even in that case we felt that it wasn't
13 a significant problem, it isn't something that's going to deter
14 the productivity of the system.

15 MR. ARMINSKI: Any comments?

16 MR. WATSJOLD: I had some questions originally
17 but I just got this thing this morning here and it looks like
18 some of the stuff that I was wondering about may be in there,
19 but I haven't had an opportunity to review any of this, so I feel
20 a little inadequate in going into the temperature thing now, now
21 that I've got this, because it may answer some of my questions,
22 or it may raise a number of additional questions.

23 MR. ARMINSKI: I don't know your name.

24 MR. HILSINGER: John Hilsinger.

25 MR. ARMINSKI: John?

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1 MR. HILSINGER: On the first page, could
2 you explain that Number 2 near the bottom? I have a hard time
3 understanding exactly what that's supposed to say.

4 MR. ARMINSKI: The statement "mainstem winter
5 water temperatures"?

6 MR. HILSINGER: Yes.

7 MR. ARMINSKI: Larry, do you want to talk --

8 MR. GILBERTSON: Mainstem -- the mainstem
9 temperatures under natural conditions are zero degrees. In the
10 reach of the river where most of the production is going on, the
11 reach of -- well, the whole river essentially is zero degrees.
12 And therefore we -- that fact, together with observations of where
13 salmon are spawning in mainstem associated habitat, side channels
14 and things like that, it appears that they're keying in on ground-
15 water -- areas of groundwater upwelling. And therefore the --
16 I guess you could argue that therefore the groundwater upwelling
17 is what limits spawning, but I think the reason that the fish
18 are keying in so rigidly on these areas of groundwater upwelling
19 are because the mainstem water temperatures are zero degrees and
20 so a lot of areas that would be supplied with just intergravel
21 flow are probably at fairly low temperatures also. And so we
22 think that mainstem temperatures during the winter do limit the
23 availability of spawning areas in the mainstem. And with project
24 there will be a stretch of the river from Devil Canyon to somewhere
25 between Gold Creek and Curry that will receive warmer water

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1 temperatures. And so there is a potential for increasing avail-
2 able spawning habitat.

3 MR. HILSINGER: I guess the thing that comes
4 to mind is that the number of spawners is going to be limited
5 by what goes through the commercial fishery, and so there may
6 actually not be any more spawning fish.

7 MR. GILBERT: I would agree. I would agree
8 with that. This is simply saying that if more spawners did escape
9 the fishery then with project there may be more available spawning
10 habitat that they can make choices from.

11 MR. ARMINSKI: Tom?

12 MR. MEARS: Yes, I dislike this statement
13 for several reasons. First of all, it seems to be -- it's a highly
14 speculative statement to be included under something called "pre-
15 sent knowledge." The second thing I've -- well, another reason
16 that I object to this statement is that it almost presupposes
17 that the fish know -- the way it's written it presupposes that
18 the fish know that the mainstem's going to be a nicer place in
19 the wintertime and therefore they're going to want to spawn there.
20 And, you know, they're not. They're not going to know that ahead
21 of time. Thirdly, the information that -- I recall reading some
22 stuff done in Southeastern by McNeil and people that work for
23 him years ago that seemed to indicate that the fish were attracted
24 to upwelling water because it was upwelling, not because it was
25 three degrees or four degrees or two degrees. They were working

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1 with pink salmon streams where because of the normal coursing
2 of the stream water would enter the streambed and leave the stream-
3 bed, upwell from the streambed, and it was, you know, the same
4 water, it just made a temporary trip through a gravel bar, and
5 so, you know, I don't think the -- I guess I would use that, the
6 work of McNeil, to challenge the theory behind why this statement
7 is made.

8 MR. GILBERTSON: Well, I guess I would chal-
9 lenge McNeil for the Susitna. We have -- we have looked at main-
10 stem areas as extensively as you can look at those mainstem areas,
11 I think, and we have -- or, the Su Hydro people have located areas
12 where the salmon do spawn in side channel and mainstem type habi-
13 tats. And with rare exception those locations are associated
14 with groundwater upwelling.

15 MR. MEARS: I don't disagree with that.
16 What I'm saying, though, is in the Southeastern studies, the rea-
17 son the fish went there was because it was upwelling, not because
18 it was any difference in temperature than any of the other --
19 the water surrounding it. In their instance they were -- they
20 did not have spring water or --

21 MR. GILBERTSON: Oh, all right, sure. But
22 in -- this is getting a little esoteric, but in an evolutionary
23 sense probably the reason that they're keying on groundwater up-
24 welling is because of the temperature regime through the winter,
25 and those individuals that key on groundwater upwelling, their

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1 eggs are going to be more likely to survive a winter, more likely
2 to get through the winter without freezing up. Now, on another
3 part of your point, you know, nothing in the biological world
4 is rigid. And it's a common thing in all the salmon populations
5 that I've ever looked at is you have individuals that "make mis-
6 takes", and you have strays, wanderers, and we have observed that
7 sort of thing in the Susitna. There are individuals in the popu-
8 lation -- well, pairs in the population that do spawn in areas
9 of the mainstem and side channels that apparently do not have
10 groundwater upwelling, so there is a component of the population
11 that could colonize these other mainstem areas if they became
12 suitable for overwinter survival. That's not an uncommon thing
13 in salmon populations.

14 MR. SCORDELIS: They could be spawning out --

15 MR. GILBERTSON: In fact, I think that's
16 a rule -- you could say that that's a rule in salmon populations.

17 MR. SCORDELIS: Those fish could be spawning
18 out there now, it's just their progeny aren't surviving because
19 conditions aren't suitable for survival, but given those condi-
20 tions, that portion of the population may become established.

21 MR. MEARS: I'll continue to disagree with
22 the interpretation and I just don't think it's well founded enough
23 to be included in a statement of present knowledge, but that
24 amounts to an automatic mitigation. I just don't think it's --
25 you know, it might be nice to consider in a theoretical aspect,

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1 but I think when it comes to toting up one side versus the other
2 that you ought to just leave it out.

3 MR. GILBERTSON: Okay, Tom, we're not pro-
4 posing this as mitigation, but in this case we're not -- we're
5 not trying to tell you that there'll be all kinds of new main-
6 stem habitat for spawning and therefore we can trade it for some
7 other sites. That's just not the point here at all. It just --

8 MR. MEARS: What is the point?

9 MR. GILBERTSON: Present knowledge. It's
10 what we feel is going to happen, what the conditions are going
11 to be like with the project. If you want that stricken, I --
12 we can take it out without --

13 MR. MEARS: It would read a lot better for
14 me. Continuing on, Number 3, operation temperatures established
15 that the fish'll survive this whole affair. That's good, you
16 know, I'm -- the opposite would not be good, you know, if they
17 were -- if the predicted temperatures were going to be lethal
18 to the fish, that's obviously not good. But I continue to have
19 difficulty with trying to resolve this issue when we don't --
20 I have never figured out what the operation temp -- or, the opera-
21 tion regime of this dam system is going to be. It changes, it
22 seems, from month to month and week to week, sometimes. But --
23 so I don't -- you know, I don't see how we can even talk about
24 it until we get the operation temperatures or the operation regime,
25 the scheme -- I don't know that I'm using the right terminology

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1 here, but at least how the Power Authority is really going to
2 operate the dam figured out, I don't know how we can even talk
3 about temperatures any more.

4 Thirdly, in respect to that Number 3, I want to know
5 whether the temperature differentials are sufficient enough to
6 reduce the growth rate of the rearing species enough so that they
7 will smolt in two years versus one or three years versus two.
8 I mean, I'm perfectly willing to accept that the -- that within
9 the framework you've been working that the fish are going to sur-
10 vive all this. I want to know whether they're going to continue
11 to perform at about the same level of efficiency as they have
12 in the past. I also want to know whether the -- what effects
13 the colder water during the outmigration is going to have on the
14 survival of those chums and sockeyes and so on that may be in
15 the system -- out in the system at that time of the year. I don't
16 see that anywhere in the information that's here.

17 MR. ARMINSKI: Let me just say one thing.
18 I think as far as the operating scenarios for this project, up
19 until recently we've always proposed KC, which -- a specific
20 mode of operation for this project. And recently we revised that
21 to KC6, and there's not a significance difference of the tempera-
22 ture regime related to either one of those. So I don't think
23 that we change this on a regular basis.

24 MR. MEARS: Well, in your analysis I don't
25 think you change it, but in the -- in the newspaper it changes

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1 regularly as to how we're going to operate the dam and what the
2 benefits are going to be and so forth. As far as, you know, the
3 scientific analysis of what's going on, I agree, you haven't
4 changed it. It's just that the politicians and would-be politi-
5 cians are continuously talking about revising the flow scenarios.

6 MR. ARMINSKI: Well, I guess we always envi-
7 sion that the flow scenario would be set by this group, or one
8 very similar to it, based on an agreement. Granted, that's --
9 you know, that's, like you say, subject to change with the poli-
10 ticians, but, you know, I think what we've proposed is a reason-
11 able flow regime, and we certainly can't ask the politicians what
12 they've proposed, because they don't have any idea.

13 MR. GILBERTSON: On your growth rate ques-
14 tion. You want your question addressed in the position paper,
15 is that -- or are you just asking now?

16 MR. MEARS: Well, I guess I'm saying that
17 I have never considered it to be an issue that the fish would
18 survive post-dam Susitna River. And it's always been how effi-
19 ciently, how effectively they're going to do -- they're going
20 to survive it. And I don't see anything in this temperature posi-
21 tion paper that talks about that -- that efficiency. It's a fact
22 we're talking about three-year smolts versus two-year smolts,
23 we're also talking about a considerable decrease in the number
24 of smolts that are headed to sea. So there's fish to be lost
25 here, considerable numbers of fish to be lost, if there is a

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1 temperature effect on age of smolting.

2 MR. GILBERTSON: Okay, well, you have to
3 -- A couple things. One thing is that we did look at growth rate,
4 and the effects of the resulting temperature regime on growth
5 rate. And the approach we took was to try to take a worst case
6 situation. We assumed that the fish were going to -- the fish
7 would be rearing in mainstem waters throughout the summer, which
8 -- you know, starting in June and going through September, which
9 is not the case, but we assumed that. We assumed that the fish
10 were going to stay in the middle river throughout that period,
11 again which is -- for the most part is not the case. And there
12 was another assumption. Oh, right, okay, I'm sorry. In the model
13 we used, we used a model developed by a man named Brett in British
14 Columbia. Okay, in that model he assumed that 15 degrees centi-
15 grade is the optimum temperature for growth. He was working on
16 populations of sockeye and so for those populations I have no
17 doubt that 15 degrees is optimum. I doubt very much that 15
18 degrees is optimum for fish rearing in the Susitna River, but
19 we -- still, we used that --

20 MR. MEARS: If it is, they rarely experience
21 it.

22 MR. GILBERTSON: Right. Right. We also
23 assumed that the fish could feed to satiation, because the amount
24 of ration the fish has available to them affects the optimum growth
25 temperature. The less -- in general, the less ration you have

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1 available the lower is your optimum temperature. So we assumed
2 full ration. And we did that because we expect with project tem-
3 peratures to be lower under -- with project conditions than under
4 natural conditions, so we're biasing our analysis away from
5 favoring a good -- painting a good picture for the project. The
6 worst case, using all those things, was that it was the first
7 -- when Devil Canyon first comes on line, that's when you're going
8 to have the lowest temperatures. And in that case, there is
9 between a 25 and 30% reduction in growth for fish rearing in the
10 middle river. Now --

11 MR. MEARS: You're talking about the 25%
12 reduction in growth, would that be length attained over a period
13 of time or --

14 MR. GILBERTSON: It's in weight.

15 MR. MEARS: In weight.

16 MR. GILBERTSON: Right.

17 MR. MEARS: In weight attained over a period
18 of time?

19 MR. GILBERTSON: Right. During the period
20 June through September, the major growth period during the summer.

21 MR. MEARS: Rather than a 25% decline in
22 the specific growth rate, whatever that terminology is, the daily
23 growth rate?

24 MR. GILBERTSON: Right. Right, it was total.
25 I'm just pulling numbers -- I think this is approximately right.

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1 I think under natural conditions the size at the end of the year
2 for a fish under the natural regime was something like seven grams,
3 the fish under with project conditions was about five grams.
4 I may be a little off, but it w.s something like that.

5 MR. ARMINSKI: How long is that --

6 MR. GILBERTSON: -- But another thing you
7 have to put into perspective is -- you know, any -- a reduction
8 of growth in the middle river system, given the number of fish
9 that are utilizing mainstem associated waters for rearing, if
10 you tried to measure that at Flathorn, I doubt that you could
11 detect anything, because you're only -- you're only talking about
12 between 2 and 5% of the production out of the Susitna River.
13 And if you narrow it down to rearing, you're even talking about
14 less than that. So if you went -- if you went somewhere out of
15 the middle river and tried to measure its impact, I doubt that
16 you'd be able to detect it, statistically.

17 MR. MEARS: Yes, well, I wasn't specifically
18 speaking at this point of out of the middle river.

19 MR. GILBERTSON: Well, the temperatures --
20 by the time you get to Parks Highway bridge, you're essentially
21 back to normal temperatures in the summer. In the winter, even
22 prior to that. In the winter, by the time you make it to some-
23 where around Gold Creek you're back to natural temperatures.

24 MR. MEARS: So -- I mean, I don't want to
25 lose 2% of the fish, I don't want to lose 3% of the fish. I mean,

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1 I just -- If there's effect on --

2 MR. GILBERTSON: Well, in your -- in your
3 question you made it sound like these temperature effects were
4 going to have some kind of a significant impact on -- impact on
5 production in the Susitna basin, and it's not really true. You're
6 looking at -- you're talking about such a limited area and a
7 limited number of fish that actually use those waters that will
8 experience a change in temperature, that, you know, you wouldn't
9 be able to measure -- measure the difference. But, okay, to get
10 back to your point, you don't want to lose whatever that is.
11 I understand that. And so I guess it's --

12 MR. MEARS: But we're saying here there's
13 no effect in the -- you know, there's no effect on those fish
14 because of the temperature, and I think it ought to be in there,
15 even if it's only minor, even if it's only a small amount of fish,
16 I think it ought to be there.

17 MR. GILBERTSON: Okay.

18 MR. SMITH: On -- if we're talking about
19 chinooks, you do have large numbers of chinook passing through
20 that system that could potentially be impacted. Overwintering
21 conditions, you have, again, large numbers of the chinook
22 apparently moving out of the tributaries and overwintering in
23 the mainstem or areas influenced by upwelling that are accessed
24 from the mainstem. So there is -- the potential for impact may
25 be higher than if you just looked at what's in the system now

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1 during the open water season.

2 MR. SCORDELIS: Well, winter water tempera-
3 tures are going to be warmer.

4 MR. SMITH: Yes, but is that necessarily
5 better for fish?

6 MR. SCORDELIS: Above Gold Creek. Also,
7 Fish & Game is coming up with some findings now that chinook are
8 not leaving the tribs for overwintering, that they're staying
9 in deeper -- some of the deeper pools in the tributaries, Indian --

10 MR. SMITH: -- I haven't seen that --

11 MR. SCORDELIS: It's on-going right now.
12 So it may not be true that they're all just diving out of the
13 tribs to get down to the warmer mainstem.

14 MR. WATSJOLD: Well, we see -- yes, we see
15 that in the tribs on the east side below the Talkeetna where we've
16 done work. Usually the largest majority have moved out of the
17 tribs, but there are always -- there's quite a number that stay
18 in the tribs. I think it's a matter of production or rearing
19 area, that just a few individuals stay up there that utilize that
20 area and the rest of them go out.

21 MR. SCORDELIS: Dana's been more successful
22 finding overwintering fry in the tribs this winter than in the
23 mainstem. I don't know if that's because of their effort in
24 locating fish in the mainstem or because of the size of the main-
25 stem or what, it's preliminary. But right now they're finding

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1 a lot of overwintering fish in the deep holes.

2 MR. MEARS: I don't know how you've ever
3 been able to find them in the mainstem, neither have we.

4 MR. SMITH: What was the response to Tom's
5 question about the different flow regimes and such? Now, we still
6 really haven't had an analysis of E6, and I think the argument
7 I'm hearing is that it's essentially the same as KC?

8 MR. GEMPERLINE: Yes, I can -- we have had
9 an analysis and it's in the submittal of E6 to the FERC, and it's
10 essentially the same.

11 MR. SMITH: But it's not in this AD -- ADIDC
12 (ph), so it's nothing that we have before us or that we've been
13 provided with?

14 MR. THRALL: You don't have it right now.
15 It should be winging its way to you in the mail, I assume.

16 MR. SMITH: But the results you found are
17 no change?

18 MR. GEMPERLINE: No change.

19 MR. THRALL: No change, or is -- well, I
20 don't know.

21 MR. GEMPERLINE: Well, I mean, it's -- you
22 know, a couple tenths of a degree some places, you know.

23 MR. SMITH: Yes, if that happened to be con-
24 curring with the time that we had the problems with the chinook
25 migration, and we're right at the lower tolerance level right

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1 now in KC, then I'd want -- then I'd have some concern and we'd
2 have to reopen the process.

3 MR. GILBERTSON: Now, the point -- this
4 touches on a point that as we go through these things, discuss
5 them, one -- one thing that this position paper doesn't bring
6 out, and that is that there is some flexibility in it. I mean,
7 the major mitigation component is providing multi-level intakes.
8 Okay, these runs that have been made may not take full advantage
9 of that. The operating rule that was used to generate this infor-
10 mation in the AEIDC document and then the position paper was in
11 so following -- try to match natural water temperatures. So,
12 you know, there are some adjustments that can be made. Like
13 possibly -- I would have to look at the reservoir temperatures
14 and things like that, but it's possible that if we felt that it
15 was a serious problem that there was four degree water running
16 down the river when the chinook were trying to migrate up, if
17 that's the right temperature, I'm just pulling that out of the
18 air, then there may be -- we may have some latitude in operating
19 the intakes to provide warmer water at that time. But the reason
20 we're going to have to work on that is that it may involved some
21 trade-offs. I mean, if you use the warm water earlier you may
22 lose it later and what's more important? You have to deal with
23 some things like that.

24 MR. MEARS: Just struck me funny when you
25 said it. The analysis of effects of temperature were done on

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1 a flow model that said try to emulate natural temperatures?

2 MR. GILBERTSON: Right.

3 MR. MEARS: What is that known as in -- what
4 flow case is that?

5 MR. GEMPERLINE: That's just the policy for
6 operating the multi-level intake.

7 MR. GILBERTSON: That doesn't have anything
8 to do with the flow regime, just trying to match temperature --
9 the temperature of the water.

10 MR. MEARS: Okay, but certainly the flow
11 regime affects the ability to be able to match temperature.

12 MR. GILBERTSON: Sure it does. The volume
13 of water you take out of the reservoir is going to affect, you
14 know, how much warm or cold water you have available at given
15 times of the year.

16 MR. HOSKING: With (inaudible, cough) in
17 operation and flows and so forth are measured at Gold Creek sta-
18 tion. Now, if you have a flow going down there, say, of 15 or
19 16,000 cfs, what percentage of that flow would be actually coming
20 from the dam as opposed to tributary inflow?

21 MR. GILBERTSON: About 80%.

22 MR. GEMPERLINE: I -- it would --

23 MR. GILBERTSON: It varies, depending on --

24 MR. GEMPERLINE: -- You can have a --

25 MR. GILBERTSON: -- storms and --

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1 MR. GEMPERLINE: You can have a storm in
2 the lower -- or between -- over the entire basin and you could
3 get -- you might get several thousand from the area between the
4 dams and the -- and Gold Creek. So, you know, you might only
5 have 50%. But in general, I think we're talking about -- if you
6 don't have a storm, I think the -- I mean, the basin upstream
7 of Watana is about 5200 square miles, and the basin upstream of
8 Devil Canyon is about 5800 square miles. Well, that's doesn't
9 seem -- You're talking about, out of the -- out of a 9,000 flow
10 at Gold Creek, you might be talking about an average of around
11 2,000 from the intervening area. That's with Watana on line.
12 When Devil Canyon comes on line, there isn't very much drainage
13 area between Gold Creek, and so that contribution is much, much
14 less.

15 MR. HOSKING: Just wondered what the contri-
16 bution is of ambient waters and that sort of thing to temper any
17 releases from the dam.

18 MR. GEMPERLINE: Well, that is included in
19 our modeling.

20 MR. HOSKING: It is?

21 MR. GEMPERLINE: Yes.

22 MR. GILBERTSON: Yes, it is.

23 MR. SMITH: This second year of filling
24 apparently doesn't depend on one flow case or another, but at
25 one time they were talking about installing a low level outlet

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1 works or maybe stratifying the cone valves at Devil Canyon and
2 getting a low level release that way. Is that -- that's out now
3 or -- and, I guess, to follow up on that, the charts and figures
4 that are presented in here for Watana filling, did that assume
5 that the multiple level access -- access to those works, or did
6 it assume a low level release?

7 MR. GEMPERLINE: Well, Watana filling --

8 MR. SMITH: Or Devil Canyon. Both.

9 MR. GEMPERLINE: Well, let's -- you've got
10 to take them separately. For filling of Watana, it assumed the
11 low level outlet from the dam would be used until the water level
12 in the reservoir exceeded the level required to operate the multi-
13 level intakes. It did not include an intake at elevation -- a
14 lower intake at elevation 1800 to try to take off some of the
15 warmer water a little bit earlier. Didn't include that. And
16 then that low level intake -- or, that -- the multi-level -- the
17 intake to the cone valves would be the sole means of discharging
18 water until the plant became operational, which would be the
19 remainder of the second year of filling after August and then
20 until, I think, August of the third year, when you -- the plant
21 would become operational. At that point you would start to fill
22 -- or, you would start to operate the units. Well, in fact, it
23 would be a little bit earlier than August. I think you might
24 have a unit come on line in like June of the third year. But
25 we were actually conservative there, we didn't -- we did not

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1 assume that -- when you have one unit on line, you have the poten-
2 tial of putting about 3,000 cubic feet per second through the
3 multi-level intake, and you would have to supply the remainder
4 of the 9,000 through the cone valve. We just assumed it would
5 all go through the cone valve, which gave us a little bit cooler
6 temperatures. But again, that's a worst case or a conservative
7 type of view.

8 MR. SMITH: Okay, so for the different water
9 years you looked at, some years you would be able to access the
10 multiple level intake and other years when it was particularly
11 low you'd pretty much release everything through --

12 MR. GEMPERLINE: No, in all cases that we
13 looked at in the temperature simulations you were able to operate
14 the intake to the cone valve sometime in the second year of fil-
15 ling. And you would operate the multi-level intake in the third
16 year of filling because at that point you're passing water through
17 the turbines.

18 MR. SMITH: Okay, so for one year, then,
19 you're just going out of the cone valves?

20 MR. GEMPERLINE: Yes, basically.

21 MR. ARMINSKI: Tom?

22 MR. MEARS: Tables 3 to 6, the captions all
23 include the phrase "for natural conditions in project-related
24 scenarios". Which project-related scenarios? All of them that
25 we've ever seen, a certain specific -- KC -- or, I got lost with

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1 the terminology?

2 MR. GILBERTSON: Okay, yes, the scenarios
3 there refers to first of all KC, and then it refers to the dif-
4 ferent operating conditions that are listed there, Watana filling --

5 MR. MEARS: -- Okay --

6 MR. GILBERTSON: Then the different load
7 projections. I have a correction, by the way, as long as you're
8 on the tables, if I can find it here. Table 5, that should be
9 1981, not 1974.

10 MR. MEARS: I noticed that '74 was repeated.

11 MR. GILBERTSON: And then Table 6 should
12 be 1982.

13 MR. ARMINSKI: Are there any more comments
14 on this one?

15 MR. SMITH: I have a couple quick ones.
16 The Volume II of the relationships report, do you think that will
17 have to be prepared before we can go into actually making com-
18 ments or recommendations about the structure of the downstream
19 temperature, how we want to select within your capability? Is
20 that going to provide us with any information on that?

21 MR. THRALL: You can ask for anything. Is
22 that what you're asking?

23 MR. SMITH: Well, yes, I was wondering whether
24 one of the things that's going to be addressed in that Volume
25 II is --

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1 MR. THRALL: -- It may be, but I would say
2 -- I would never hesitate to try to make your wishes known as
3 early as possible, because the earlier -- I mean, if you wait
4 'til we do our analyses and we're basing them on certain assump-
5 tions, and then you come and "oh, by the way, what I'd really
6 like to see you look at is this or that", it just --

7 MR. SMITH: It would help. For instance,
8 one of the things in this -- just glancing through this and they
9 cited one report where they're looking at bioassay work on juve-
10 nile -- I forget the species, but they were in starvation condi-
11 tions, and they looked at rearing at different temperatures, zero
12 to four degrees. They did pretty well at zero degrees, one degree,
13 two degrees. At four degrees, they had mortality and they figured
14 it was because the metabolism was so active at four degrees.
15 Well, in the past we've been thinking anything we can do to get
16 warmer water during the winter is going to be good for rearing
17 fish. That assumes a lot of things and there may be some indica-
18 tions that -- there are indications that might not be the case.
19 It seems like it might be dependent on what food source is avail-
20 able when they first hit that, and they may be attracted to that
21 four-degree water, or whatever temperature above zero we exper-
22 ience. So that sounds like we might want to be looking at primary
23 productivity and maybe some food studies, that we really -- I
24 don't think have really been established in any of the -- I can't
25 think of any tasks for FY85 that deal with that. I know we talked

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1 about in the past things like that. I don't have them all here
2 to present to you today, but I guess I can -- I can let you know.
3 I'm afraid that the -- I thought a lot of that was pretty much
4 set in concrete, that it wasn't a very flexible document at this
5 point.

6 MR. THRALL: Everything is flexible up until
7 the time it's printed. I guess we can make it so -- but, no,
8 certainly anything that you -- you know, the worst that can happen
9 is we'll have to say we can't do that right now, we don't have
10 the time or the resources. But at least we know that it's some-
11 thing that you're concerned with. And I think our whole -- our
12 whole approach to this is that we feel much more comfortable
13 working on analyses that we think are responsive to your concerns,
14 you know, than just sort of trying to set up straw men that we
15 think maybe people are concerned with. We think -- we would
16 rather really know what it is you'd like to know and then we'll
17 do the best we can to provide those answers.

18 MR. GILBERTSON: Yes, the direct answer to
19 your question, I would say no, don't wait for Volume II. I think
20 that there certainly may be some interactions there and some ad-
21 justments you could make on both estimates of habitat quantity
22 and then habitat quality when you're measuring the things
23 together. But I think we can -- we can start doing some things
24 with temperature now.

25 MR. SMITH: Can we expect any further

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1 analysis of the relationship between mainstem temperatures and
2 slough temperatures, upwellings? I liked what we got for flow,
3 we had those equations that showed the relative contribution of
4 -- from the mainstem to the groundwater of sloughs at various
5 sites within the sloughs. Are we going to get anything like that
6 for temperature, or is there going to be any more analysis -- That
7 seems to be fairly -- the most important system we're dealing
8 with, and we talked about this, and I don't know what the con-
9 stancy of that flow is. And . . .

10 MR. GILBERTSON: Yes, there'll be some more
11 data available. I don't -- what's his next report going to
12 include?

13 MR. GEMPERLINE: Actually, we're going to
14 look a little bit more at the quantity of flow, the quantity of
15 the groundwater upwelling, at least the component that comes from
16 the mainstem, and give various estimates of what it would be.
17 The temperature, actually, of the groundwater flow has been --
18 we feel reasonably confident that we aren't going to change that.
19 That appears to be equal to approximately the main -- the temper-
20 ature of the mainstem, the mean annual temperature of the main-
21 stem. At least the component that comes from the mainstem is
22 constant at that. We are not changing the average temperature
23 of the mainstem. We don't expect to change the temperature of
24 the intergravel flow.

25 MR. SMITH: The average annual temperature.

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1 MR. GEMPERLINE: Yes, but most -- in most
2 of the -- Yes, we don't -- No, we don't expect to change -- See,
3 in most cases the temperature of that groundwater --

4 MR. SMITH: -- Is the average annual --

5 MR. GEMPERLINE: -- is the average annual
6 temperature all year round, and we're not going -- since we're
7 not going to change that, we're not -- it's going to remain the
8 same.

9 MR. SMITH: What about the mitigations being
10 proposed, would that have any effect -- the fact that you're going
11 in and deepening the sloughs to intercept the lowered water table,
12 it sounds like -- for that system to work it seems to say that
13 there's a pretty quick transfer of mainstem water into those areas
14 and --

15 MR. GEMPERLINE: -- No, there's not, there's
16 a very long lag time, in most cases. In some of the cases where
17 the sloughs are -- some of the intergravel recorders are located
18 fairly close to the mainstem. The travel time between the main-
19 stem and the sloughs is very long. The head change -- a head
20 change in the mainstem translates to a rather pronounced -- well,
21 I should say an immediate effect in flow. It doesn't change the
22 temperature at all.

23 MR. BEDARD: The downriver effect of the
24 Devil Canyon dam, about a mile and a half away you have Portage
25 Creek drainage, which is quite a sizable body of water. That

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1 temperature should somewhat -- if there is a temperature change,
2 that seems as though that would somewhat offset --

3 MR. GEMPERLINE: That's been included in
4 our analysis.

5 MR. BEDARD: Then south of that you have
6 Indian River, which is also a major tributary, and in between
7 that you've got about five small tributaries.

8 MR. GEMPERLINE: Yes, AEIDC -- that was one
9 improvement that AEIDC made over what was in the license applica-
10 tion, and that is that they included the temperatures of the tri-
11 butaries. And so you'll see, if you look closely at some of their
12 -- some of the profiles in some of their earlier reports, you'll
13 see little spikes where these tributaries come in. And the
14 influence of that on the temperature.

15 MR. BEDARD: Do they have stream gauge
16 readings of both Indian and Portage of what flow that is?

17 MR. GEMPERLINE: ADF&G has taken some meas-
18 surements of that. In some cases it is substantial.

19 MR. SMITH: I'm still a little confused on
20 the cone valve placement on Devil Canyon, has that changed at
21 all?

22 MR. GEMPERLINE: No, it hasn't changed.

23 MR. SMITH: Is there any -- would there be
24 any advantage in -- could you locate them in such a way that you
25 could select for temperatures during an event above the -- you

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1 know, below the one in 50?

2 MR. GEMPERLINE: Well, we looked at that,
3 and it does have a -- I think it can raise the temperature down-
4 stream, immediately downstream, by a degree or so, for the short
5 period when those cone valves -- for about a two-week period.
6 If you look at the temperature simulations you'll see there's
7 a big drop when the cone valves are first used. And that drop
8 lasts for about two weeks, at which time you've taken all the
9 water out of Devil Canyon and replaced it with Watana discharge,
10 so your temperature then rises up again. For that two-week period
11 you could improve temperatures by a small amount.

12 MR. SMITH: When would that normally occur?
13 Do you have one time of the year when most of the --

14 MR. GEMPERLINE: -- July and August --

15 MR. SMITH: -- cone valve operation would --

16 MR. GEMPERLINE: Let me just -- And I'm just
17 looking now at the submittal to the FERC on the temperatures.
18 Okay, this is -- yes, this is primarily -- and I'm talking about
19 when Devil -- you know, when Devil Canyon first comes on line.
20 It's -- that's basically in July, and it may go over to early
21 August, but it's usually mid to late July.

22 MR. ARMINSKI: Any other comments on 2.5?
23 Okay, I guess that ends our discussion on the papers. Let me
24 just briefly reiterate what at least I've got written down for
25 action items here.

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1 W-7, we're going to -- this is the raptor nests. We're
2 going to discuss the probability of a test program to establish
3 nests before we actually have to mitigate. W-9, this is the
4 quantification and mitigation of habitat impacted through the
5 support facilities. I basically didn't have any action items
6 on that. R-1, this is the recreational fishing. We're going
7 to look at revising our mitigation plans, particularly with respect
8 to dropping this measure of propagating and stocking with rainbow
9 trout in the reservoir and lakes near the area. We're also going
10 to look into improving access outside of the project area to create
11 a recreational benefit. F-2.2, pH, there's no further discussion
12 or action required for that one. F-2.3, heavy metals. We're
13 going to assess the possibility of increases in other metals in
14 the system other than mercury. And formalize a discussion of
15 other potential problems that might relate to those increases,
16 if they're seen. We're going to further define what -- we're
17 going to look at downstream accumulation or increases, particu-
18 larly in mercury, based on other projects. And we're going to
19 have further discussion on this paper regarding baseline data
20 collection to establish what the baseline of metals in the fish.
21 On gas supersaturation, we're going to look at or try to assess
22 what the supersaturation potential is at events greater than a
23 50-year event where we have some spilling, possibly the 100-year
24 event is what was suggested here. And on water temperature, I
25 think what we're going to have to discuss is expand the discussion

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1 on the impact of increased temperatures on development and smol-
2 tification. I think we have to be more precise in our specifica-
3 tion of what the perceived impact is, rather than saying it's
4 insignificant. I think we want to say if we're going to lose
5 -- or, possibly impact 2 to 3% of rearing fish, we need to say
6 that.

7 And that's all I've got for action items. If anyone else
8 has got anything they want to add to that . . . Okay, our next
9 meeting is on March -- Oh, Leroy?

10 MR. LATTA: W-5.

11 MR. ARMINSKI: Okay, let's --

12 MR. LATTA: Basically at the last settlement
13 meeting Richard asked us to take a look at the mining claim situa-
14 tion and in the little bit of research we've had time to do so
15 far we've found five new claims that haven't -- that have just
16 come in the door, they're on the computer, they haven't gone to,
17 you know, graphics to be plotted or anything yet. So it appears
18 that the mining activity up on Jade Creek is pretty active. I'm
19 not sure at this time how it'll affect your mitigation paper,
20 but we can get that information to Chuck as it comes up.

21 MR. ROSENBERG: These are in addition to
22 those ones that are already there?

23 MR. LATTA: Yes.

24 MR. ROSENBERG: Five new ones?

25 MR. LATTA: Five brand-new ones, yes. We're

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1 not sure if they're downstream or in the actual mitigation area.
2 If they're farther down the creek or where.

3 MR. ARMINSKI: Okay, our next meeting's on
4 March 22nd. We'll try to get you some indication -- it may not
5 go out with the initial mailing, but -- or it may not have already
6 gone out -- Did the mailing go out already? Okay. Try to get
7 something to you that's going to indicate what we're going to
8 discuss under old business. We probably won't know until shortly
9 before the meeting, but we'll try to get you something on that,
10 so that if there's not a paper that --

11 MR. ROBINSON: We can, as always, get the
12 information posted in the Power Authority office, as it is on
13 a weekly basis.

14 MR. ARMINSKI: Okay.

15 MR. ROBINSON: We can include which papers
16 will be discussed under old business there. At a minimum, we'll
17 have that posted.

18 MR. ARMINSKI: Jim?

19 MR. THRALL: I just again want to remind
20 or ask people if they would please go over to the board -- and
21 I'm not trying to pressure you into writing off issues, I would
22 rather have you say "no, I don't agree with that", but we want
23 the record. So if you want to go over and look at the issues
24 and put in some sort of a yes, no, no interest, this is a terrible
25 thing that's got to be redone, whatever your thoughts are. Again,

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1 this is something that Harza-Ebasco in particular needs to know
2 so we know where we stand, and it's something that reminds us
3 where we are on the docket.

4 MR. ARMINSKI: If you've got any comments,
5 either written or verbal, that you want to pass along, just feel
6 free to call the Power Authority or Harza-Ebasco and -- or send
7 your written comments to the Power Authority to our attention.
8 Anything else? Bruce?

9 MR. BEDARD: The only thing I was going to
10 mention in regards to the mining claims, in the space on state
11 land (ph), stop mining of -- or, make miners aware that their
12 claim is subject to a power project, similar to what we had to
13 do with the open to entry lands on Indian River. And the reason
14 for it is, once these miners get their claims, it's like an act
15 of God to get them out of there. Whether they have a valid claim
16 or not.

17 MR. ARMINSKI: I don't think -- I don't think
18 we can unless we've got a competing right.

19 MR. LATTA: I think once you've got a license
20 then we can talk about doing several things, but at this time
21 I don't think there's much we can do. I -- we're going to meet
22 with Gallagher as soon as things slow down a little bit and talk
23 about it some. But right now, I think, until the license comes
24 through, we're kind of -- we're stuck. We're talking some major
25 -- major actions.

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1 MR. ARMINSKI: Anyone that didn't sign the
2 sign-in sheet, please do that before you leave so that we've got
3 a record. And we'll have a transcript available within a week
4 or so.

5 MR. ROSENBERG: Are we going to have to
6 request -- I know a letter came by to request one. You're not
7 just going to send them out, then?

8 MR. ROBINSON: They have to be requested.

9 MR. ROSENBERG: How big are these things?

10 MR. ROBINSON: Well, the last meeting's
11 transcript, I think, Dan, was about 90 pages long. So we figure
12 -- figure 100 pages, about 100 pages for around four hours of
13 meeting, something like that. Depending on how fast people talk.

14 MR. ROSENBERG: I'd like to just get at least
15 one copy that we could have for our files of each of these
16 meetings.

17 MR. ROBINSON: Sure.

18 MR. ROSENTHAL: Is that the policy, you're
19 going to give each intervenor a transcript or only if they request
20 it?

21 MR. ARMINSKI: Well, it has been if you've
22 requested it. If you want to make any request, standing request,
23 we'll . . . Okay, that's it, thank you for coming.

24 END OF PROCEEDINGS

25 * * * * *

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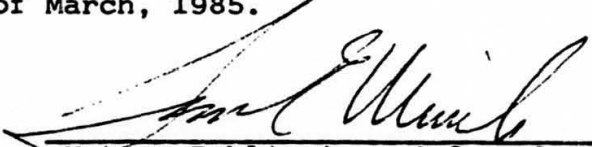
I, Teresa E. Mielke, Notary Public in and for the State of Alaska, residing at Anchorage, Alaska, and Electronic Reporter for Gemini Reporting Services, do hereby certify:

That the annexed and foregoing position paper discussion meeting was taken before me on the 11th day of March, 1985, beginning at the hour of 8:30 a.m., in the Alyeska Room of the Northern Lights Inn, Anchorage, Alaska;

That this transcript as heretofore annexed is a true and correct transcription of said proceedings, taken by me electronically and thereafter transcribed by me.

I am not a relative nor employee nor attorney nor counsel of any of the parties, nor am I financially interested in this action.

IN WITNESS WHEREOF, I have hereunto set my hand and affixed my seal this 13th day of March, 1985.


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