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MONDAY, NOVEMBER 8, 1993, 9 A.M.

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MR. DEL PIERO: Ladies and gentlemen, this hearing will come to order. For those of you that may not have been present before, my name is Marc Del Piero, Vice Chairman of the State Water Resources Control Board.

This is the time and the place for the continuation of the hearing regarding the amendment of City of Los Angeles Water Rights Licenses on the tributaries to Mono Lake.

Sitting with me this morning are two of my colleagues and good friends, James Stubchaer on my immediate right, who has frequently been seated with me during the course of water rights hearings over the last month or so, and, to his immediate right is Mr. John Brown, my old and dear friend, who knows everything there is to know about water in the State of California, because I said so.

Nonetheless, ladies and gentlemen, this is the time and place where we will continue the hearings that we ended last, I guess, two weeks ago. We are going to begin today's process with the City of Los Angeles, represented, I believe, either by Mr. Birmingham or Ms. Goldsmith. Ms. Goldsmith, are you taking it today?

MS. GOLDSMITH: I am standing in at the moment for Mr. Birmingham. He is detained at the office, and he may join us later this morning.

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1 MR. DEL PIERO: Is there a problem in terms of a
2 presentation this morning?

3 MS. GOLDSMITH: No, there is not.

4 MR. DEL PIERO: And when last we left, we had just
5 finished, I believe, the last panel of Los Angeles Water And
6 Power; is that right, and we have a new witness now.

7 Before I go any further, a number of the individuals
8 who may wish to present testimony here today may in fact not
9 have been sworn during the course of the last hearing. If you
10 have been, you don't have to stand again. If you have not
11 been sworn -- is there anyone here wishing to present
12 testimony who has not been sworn? Everyone has taken the
13 oath. Good. Then why don't you begin, Ms. Goldsmith.

14 MS. GOLDSMITH: The first witness that we call today is
15 Dr. Robert Beschta.

16 ROBERT BESCHTA,
17 having been sworn, testified as follows:

18 DIRECT EXAMINATION,

19 BY MS. GOLDSMITH:

20 Q Dr. Beschta, would you state your name and spell it for
21 the record?

22 A My name is Robert Beschta, B-e-s-c-h-t-a.

23 Q Where are you employed?

24 A I am employed by the Oregon State University at
25 Corvallis, Oregon.

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1 Q Do you have a copy of LADWP Exhibit No. 10?

2 A Yes, I do. It is my resume'.

3 Q And is that a true and correct statement of your
4 qualifications and experience?

5 A It is a bit abbreviated inasmuch as the publication
6 record only goes to 1985, so it is not totally complete.

7 Q Are there significant publications that you would like
8 to mention in addition to the ones listed on Exhibit No. 10?

9 A I would like to include those, and I have a listing of
10 those that I can submit.

11 Q Do you have extra copies for other counsel?

12 A No, I don't.

13 MS. GOLDSMITH: Perhaps we can have additional copies
14 made.

15 MR. DEL PIERO: Fine, if you want to have those ready
16 after lunch.

17 MS. GOLDSMITH: Q Would you briefly summarize your
18 qualifications and experience?

19 A Since 1974 I have been a Professor or at least started
20 as Assistant Professor at Oregon State University at
21 Corvallis. I worked through 1981 as both Assistant and
22 Associate Professor in Hydrology. In 1982 I spent a one-year
23 sabbatical in New Zealand in the mountainous country of South
24 Island.

25 Since 1982, I have been a full Professor at OSU, again

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1 in hydrology. I also operated as a department head for one
2 year during that period.

3 My position is one where I do both teaching and
4 research as well as extension and workshop courses.

5 The courses that I teach are courses in watershed
6 processes, forest land-use, and water quality, a graduate
7 class. My research activities have varied over the years and
8 involved such things as erosion and sedimentation, suspended
9 sediment transport in streams, bedload sediment transport in
10 streams, factors affecting the occurrence in pools.

11 I have looked at things related to the effects of
12 vegetation on channel morphology. I have done studies looking
13 at the effect of high flows on channel morphology, and effects
14 that they may have.

15 I have done studies that relate to management impacts
16 to stream temperatures, the role that riparian vegetation
17 plays with regard to stream temperatures and have put together
18 a model on that and am involved in several ongoing studies
19 right now looking at channels and stream temperatures.

20 I have been involved in doing things related to
21 modeling, hydrologic modeling, of peak flows in forested
22 watersheds, and the estimation of peak flows in mountainous
23 terrain.

24 And, in recent years, I have been involved and am
25 involved in projects looking at subsurface flows associated

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1 with riparian systems, of streams and riparian systems.

2 As far as the other activities other than strict
3 teaching and research that I have been involved in, I have had
4 the opportunity to be Associate Editor for the Water Resources
5 Bulletin, which is a national journal of the American Water
6 Resources Association.

7 I have been a member of the Board of Registration for
8 the American Institute of Hydrology and am currently their
9 Academic Vice President. I have been involved and a
10 participant in the Bonneville Power Administration reviews of
11 fish habitat and enhancement projects, fish habitation
12 modification projects in Oregon and Idaho.

13 I am a member of the Marys Peak Watershed Commission,
14 which is a body that is in place by the City of Corvallis
15 where it is a municipal watershed, and am currently a member
16 of the Temperature Committee for the Department of
17 Environmental Quality for the State of Oregon.

18 I am currently also sitting on a panel of the National
19 Academy of Sciences looking at the question of salmonids in
20 the Pacific Northwest, the causes for decline status of the
21 stocks and opportunities for restoration.

22 Q LADWP Exhibit 12 is the paper by Mark T. Hill, William
23 S. Platts, and Robert L. Beschta, entitled "Ecological and
24 Geomorphological Concepts for Instream and Out of Channel Flow
25 Requirements". It was published in Rivers, Volume 2, No. 3.

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1 Are you familiar with that paper?

2 A Yes, I am.

3 Q And did you rely on the information contained in it and
4 the conclusions that are in it in forming your opinions
5 relating to the Mono Basin?

6 A In part.

7 Q LADWP Exhibit No. 9 is a copy of the direct testimony
8 of Robert L. Beschta. Is the testimony presented therein your
9 testimony?

10 A Yes, it is.

11 Q Are there any additions or corrections that you would
12 want to make to it?

13 A Well, there are a couple of corrections. One is
14 perhaps a bit trivial.

15 On pages 23 and 24, I refer to my references to
16 "Chapman (1992)" and "Chapman (1993)", and those should have
17 been "Chapman and Platts (1993)", and I have a corrected
18 reference for that.

19 Another one is that in the write-up here there is
20 obviously a line that got dropped. They had me graduating
21 from Utah State University with my Ph.D., and that's not the
22 case. I graduated from Utah State University in 1967 with an
23 M.S. Degree in Forest Hydrology. I graduated from the
24 University of Arizona in Tucson in 1974 with a Ph.D. in
25 Watershed Management. So I have a correction page I would

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1 like to submit. Unfortunately, I have only one copy.

2 MS. GOLDSMITH: We will make copies for counsel and
3 have them available.

4 Q Are you familiar with the video tape, LADWP No. 11?

5 A Yes, I am.

6 Q And have you personally visited the sites which are
7 shown on that video?

8 A Yes, I have.

9 Q Would viewing the video help explain or illustrate your
10 testimony today?

11 A I believe it would, yes.

12 Q I ask you now to briefly summarize your testimony and
13 invite you to use LADWP No. 11 as you feel appropriate.

14 A Members of the Board and Mr. Del Piero, I am going to
15 shorten my testimony. I am going to try to keep it as brief
16 as I can. I covered a fair amount of ground in the written
17 testimony, and I am in essence going to skip some of the first
18 sections relating to the history of use and impacts and
19 effects it has had in the Rush and Lee Vining drainages, and
20 I would really like to move on to my commentary, which focuses
21 on a set of questions which I address in more detail also in
22 the written testimony, but which I am going to summarize here
23 orally in front of you.

24 One of these sets of comments focuses on the
25 restoration activities in Rush and Lee Vining Creeks and, in

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1 this particular commentary here, I will attempt to address the
2 following question, which is taken from the Notice of Public
3 Hearing. The question is: What stream restoration or other
4 measures are needed to reestablish and maintain the conditions
5 that benefitted fisheries in the Mono Basin -- tributary
6 streams -- prior to the diversion of water from the Mono Lake
7 Basin?

8 A recent publication of the National Academy of
9 Sciences, entitled "Restoration of Aquatic Ecosystems",
10 defines "restoration" as the "reestablishment of pre-
11 disturbance aquatic functions and related physical, chemical,
12 and biological characteristics." Whereas restoration aims to
13 return an ecosystem to a former natural condition, the
14 altering of a landscape to a new or modified use to serve a
15 specific human purpose would instead be termed reclamation,
16 rehabilitation, or in some instances, enhancement.

17 So terminology is important, at least the way we use it
18 and what we are intending when we say "restoration."

19 There can be no doubt that the two most important
20 restoration activities that have occurred to date are: (1)
21 the return of continuous flows to these streams and (2) the
22 grazing moratorium implemented by LADWP in 1991. The return
23 of flows was obviously a necessary component of any
24 restoration plan.

25 This water, in conjunction with the removal of grazing

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1 from streamside areas, has initiated and sustained important
2 establishment and growth responses by the riparian vegetation.

3 The astounding increase in cover, and I wish to
4 emphasize the word "astounding" -- I've been quite impressed
5 in many ways with the restoration or the reestablishment of
6 vegetation taking place in that system, but the astounding
7 increase in cover and diversity of herbaceous and woody
8 vegetation is already providing important restoration benefits
9 to these streams, and will increasingly do so in the coming
10 years.

11 Now, from the perspective of developing sustainable
12 aquatic and riparian ecosystems for the benefit of introduced
13 fish as well as other native aquatic organisms, several
14 restoration principles need to be emphasized. As I have
15 previously indicated, the return flows and the removal of
16 grazing pressure has allowed the widespread establishment and
17 rapid growth of riparian vegetation, particularly willows and
18 cottonwoods.

19 Both willows and cottonwoods were important riparian
20 species of the gallery forests that dominated these streams
21 before human intervention. Their prolific return provides
22 important evidence that these stream systems are indeed
23 recovering. At this point, I would like to illustrate some of
24 this recovery with a video tape showing sections of Rush and
25 Lee Vining Creeks. So, if I could at this point, we would

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1 like to view --
2 (At this point the video tape was started.)
3 MR. DODGE: Mr. Chairman, I have --
4 MR. DEL PIERO: Hold it. Mr. Dodge.
5 MR. DODGE: I don't think that's Dr. Beschta who is
6 speaking in the audio portion. I request, if they want to
7 show a video, that's fine, but there shouldn't be an audio
8 from someone who is not subject to cross-examination.
9 MR. DEL PIERO: Ms. Goldsmith, do you have a comment?
10 MS. GOLDSMITH: The narrator on the video tape is Brian
11 Tillemans, who is an LADWP employee, and he will be testifying
12 later in the hearing, and we will ask to introduce the video
13 tape after his testimony to authenticate the exhibit.
14 However, I believe that I could obviate the problems
15 with questions to Dr. Beschta.
16 MR. DODGE: Well, I don't think she can obviate the
17 problem with questions to Dr. Beschta. The point at issue is
18 whether we are going to be allowed to cross-examine Mr.
19 Tillemans.
20 MR. DEL PIERO: Mr. Tillemans is on the witness list.
21 MS. GOLDSMITH: Yes, he is.
22 MR. DEL PIERO: Is that satisfactory?
23 MR. DODGE: So we are going to be allowed to cross-
24 examine Mr. Tillemans with the video later?
25 MR. DEL PIERO: Is that correct?

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1 MS. GOLDSMITH: That is correct. However, I think we
2 have a problem with the volume.

3 MR. DEL PIERO: Mr. Dodge.

4 MR. DODGE: One more point of order. Is there some way
5 where we can know exactly where a point comes up so we can
6 replay it in the cross-examination of Mr. Tillemans?

7 MR. DEL PIERO: There is no time indicator on the video
8 tape that I am aware of.

9 If you would be kind enough, in the event there is an
10 objection, since you have the control, if you would be good
11 enough to stop it in the event someone raises an objection so
12 we can at least identify the site on the tape in terms of
13 cross-examination.

14 MR. STUBCHAER: Isn't there a tape counter so that you
15 could set it at zero at the beginning of the tape and record
16 that number?

17 MS. CAHILL: Would it be possible to put Mr. Tillemans
18 on a panel with Dr. Beschta for a portion of the testimony so
19 that we might have cross-examination in a contemporaneous
20 fashion?

21 MR. DEL PIERO: Ms. Goldsmith, when did you anticipate
22 Mr. Tillemans being presented?

23 MS. GOLDSMITH: Next week.

24 MR. DEL PIERO: Dr. Beschta is going to be gone by
25 then.

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1 MS. GOLDSMITH: Yes.
2 MR. DEL PIERO: Is there a chance of having him up here
3 tomorrow?
4 MS. GOLDSMITH: Let me ask.
5 MR. HERRERA: We do have a counter.
6 MR. DEL PIERO: Thanks. We are making progress here.
7 MS. GOLDSMITH: Mr. Tillemans is available to answer
8 questions about the tape. He is not prepared with his full
9 testimony today. The only complication is he needs to be
10 sworn.
11 MR. DEL PIERO: Mr. Dodge.
12 MR. DODGE: We were not told by LADWP that Mr.
13 Tillemans was going to come on this week. I have no objection
14 to his being on the panel. I don't want to waive my right to
15 fully cross-examine about everything.
16 MR. DEL PIERO: I don't think he is available for
17 cross-examination about everything. He did indicate he would
18 be prepared to comment about what's on the tape.
19 MR. DODGE: I simply want to reserve my right to cross-
20 examine him on the tape when he comes on next week.
21 MR. DEL PIERO: Ms. Cahill.
22 MS. CAHILL: I think it would be best if we were able
23 to examine him now.
24 MR. DEL PIERO: Well, let's do this --
25 MR. DODGE: I have no objection to Ms. Cahill's

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1 suggestion.

2 MR. DEL PIERO: I understand. Let's do this: After
3 the tape has been played, assuming that we ever get through
4 this, I am going to ask Mr. Tillemans to be sworn and that he
5 be made available for questions regarding information that is
6 on the tape. That does two things. One, it allows the
7 individual who wishes to ask questions in regard to his
8 representation on the tape to cross-examine him at the same
9 time Dr. Beschta is being cross-examined, and, second,
10 inasmuch as I recognize he was not prepared to come in here
11 and testify, I will be very cautious as to ensuring that the
12 cross-examination today does not go too far afield, so that he
13 is afforded ample opportunity to prepare as a witness for the
14 panel next week.

15 MS. GOLDSMITH: That's certainly acceptable to us.

16 MR. DEL PIERO: Good. Now, if we could begin the tape
17 -- I am most interested in seeing what's on it.

18 (Thereupon the tape was played.)

19 MR. DEL PIERO: Is that it?

20 MS. GOLDSMITH: Yes.

21 DR. BESCHTA: In early October of this year I
22 personally visited each of the sites shown on the video.
23 Although I saw them in October of this year, obviously I
24 didn't see them in September of 1987 when the original footage
25 was taken, but I can attest to the fact that these are indeed

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1 representative of a lot of what's going on in regard to Rush
2 end Lee Vining Creeks. In some areas, it's a lot better. In
3 other areas, it is not quite as good as shown here, but they
4 do indicate that the vegetation is indeed coming back.

5 In addition to the video tape, my original testimony
6 has some figures, and I would at least like to get those up in
7 front of the group here, which are large-scale reproductions
8 of photographs taken on several occasions of Rush and Lee
9 Vining Creeks, so I have got Figures 3 and 4. Figure 3 is
10 July of 1986 from an area which is known as the "hatchery
11 site", and it is looking upstream, and you can see the
12 relative scarcity of vegetation along that channel.

13 The photograph in August of 1993 is from a similar
14 location, looking into this channel area, and you can see that
15 the revegetation has been fairly remarkable across this bottom
16 land, and it is difficult, in fact, to see the stream channel
17 out there.

18 If I could look at the next two figures also, Figures
19 5 and 6.

20 Figure 5 is looking downstream from near the county
21 road -- just downstream of the county road on Lee Vining
22 Creek, and you can see Mono Lake barely in the background, but
23 it is looking toward the delta region, and you can see
24 scattered cottonwoods and willows.

25 The Figure to the right, which is Figure 6, shows the

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1 same general area in August of 1993, again looking downstream,
2 and you can see the prolific response of vegetation. Willows
3 that were present before have gained incredibly in stature.
4 They are much thicker, and the volume of the biomass is
5 increased and it's been prevalent all along that channel. The
6 vegetation is coming back in, so I would just like to have
7 those as examples of some of the things that are happening
8 along this stream.

9 Now the fundamental importance of the recovering
10 riparian vegetation along these two streams, Rush and Lee
11 Vining Creeks, as shown in the previous video tape and the
12 photographs before you, I think, cannot be overemphasized. It
13 is these plants that are providing, and will progressively
14 provide, a wide array of ecosystem benefits and functions.

15 For example, the increasing numbers and sizes of
16 streamside willows, cottonwoods, and other woody plants
17 provide:

18 Increasing shade and moderation of stream temperatures,
19 Improved nutrient and carbon cycling from leaf fall
20 that supplies food for instream invertebrates and other
21 aquatic organisms,

22 And, indeed, there are places on Rush Creek where the
23 canopy is now covering the entire channel. It's reaching
24 across.

25 There's an increased hydraulic roughness along the

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1 channel margins from the multitude of plant stems so that fine
2 sediments in transport are deposited, thus causing streams to
3 narrow and for the stream, in essence, to become deeper.

4 You end up with increased root strength and stabilized
5 banks during periods of high flow, yet allow overhanging
6 stream banks to develop, and, in fact, to have overhanging
7 streams banks almost by necessity you need roots in the
8 system.

9 This vegetation provides an increased diversity in
10 channel morphology that is demonstrated by the forming of
11 pools and riffles and the occurrence of spawning gravels in
12 hydraulically appropriate locations, and greatly increased
13 recruitment of large, woody debris within a couple of decades.

14 So with healthy riparian plant communities, these
15 streams, in conjunction with their adjacent wetland and
16 riparian areas, will increasingly provide for an array of
17 functions beneficial to fish and other aquarian organisms.

18 Now the multiple and interacting ecosystem benefits
19 that depend upon these plants cannot be simply replicated by
20 structural approaches that manipulate physical habitat. In
21 other words, the restructuring of a channel does not
22 necessarily represent restoration. Some of the approaches
23 that have been used on Rush and Lee Vining Creeks include, for
24 example, excavating large pools within and along channels,
25 adding spawning-sized gravels to a channel, even though such

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1 gravels are a natural component of the bed and banks and are
2 already present, the placing of weir logs and boulder dams in
3 channels, the armoring of the outside of meander bends, the
4 dredging and filling of near-channel and off-channel wetlands,
5 and disturbing channel banks, riparian vegetation, and upland
6 vegetation by the heavy equipment that is utilized with these
7 various practices. These structural approaches obviously are
8 detrimental to the system.

9 These practices represent an attempt to significantly
10 modify the characteristics of a naturally-recovering aquatic
11 and riparian ecosystem. And this active intervention with
12 construction equipment has created significant adverse impacts
13 to the natural restoration that is occurring on Rush and Lee
14 Vining Creeks.

15 As another example of the misplaced efforts of the
16 active intervention approach as it is practiced, limitations
17 to high flows have been proposed because they might move
18 gravels downstream. This type of flow restriction represents
19 a general misunderstanding of how channel banks, bed material,
20 and streamside vegetation interact to cause local hydraulic
21 conditions that provide for the long-term presence of spawning
22 gravels in these stream systems.

23 Gravel deposits form naturally in channels during
24 periods of high flow, and they occur at specific locations in
25 the channel that are of benefit to fisheries. In contrast,

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1 gravels that are artificially placed in channels and which are
2 accompanied by flow restrictions may have few fisheries
3 benefits.

4 So, in summary, structural approaches to habitat
5 manipulation in Rush and Lee Vining Creeks are unneeded and
6 provide little functional improvement to either stream or
7 riparian systems. In many instances, these efforts have been
8 counterproductive to the goal of achieving sustainable
9 fisheries and aquatic habitat.

10 Such conclusions are not unique to Rush and Lee Vining
11 Creeks. Over the past decade, there have been widespread
12 efforts at structurally modifying streams for improved
13 fisheries habitat throughout the Western United States. The
14 ability of these practices to provide fisheries benefits in
15 mountain streams have not been widely demonstrated.

16 My next set of comments, which follow again from the
17 written testimony, relate to future restoration activities for
18 both Rush and Lee Vining Creeks. I will attempt to address
19 the following Notice of Public Hearing question: "What
20 measures should be undertaken on an interim basis until the
21 fisheries have been reestablished and on a long-term basis to
22 maintain the fisheries once they have been reestablished?"

23 Stream and riparian ecosystems draining the Sierra
24 mountains have evolved over the millennia in response to a
25 variety of natural disturbance patterns. The dynamics of

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1 seasonal snowmelt flows represent perhaps the most important
2 natural disturbance regime affecting Rush and Lee Vining
3 Creeks.

4 In particular, it is the variation in flows, both
5 seasonally and from year to year that is crucial for creating
6 pool and riffle habitat, for the building of stream banks and
7 floodplains, for creating near-channel wetlands, and for
8 causing the appropriate hydro periods that ensure the
9 establishment and growth of streamside vegetation and also the
10 succession of those species.

11 Hence, in the short term, I would recommend the
12 continued rewatering of these streams and the continued
13 exclusion of livestock grazing. I would also recommend the
14 cessation of structural approaches to channel and habitat
15 manipulations because of their often counter-productive impact
16 to aquatic and riparian systems.

17 For the long-term, it is crucial to continue practices
18 that ensure the establishment, growth, and succession of
19 riparian vegetation as these diverse plants provide a
20 multitude of ecosystem benefits and functions necessary to
21 sustain aquatic organisms and healthy fisheries.

22 These riparian functions include such things as short-
23 and long-term surface water storage, stream velocity reduction
24 due to the effects of above-the-ground plant parts -- both the
25 stems and their roots are working here -- moderation of

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1 extreme flow events, moderation of groundwater discharge,
2 nutrient and particulate retention, nutrient processing,
3 maintenance of species diversity and plant community biomass,
4 maintenance of food web support and habitat characteristics,
5 and perhaps others.

6 Another fundamental component of any long-term
7 restoration plan for Rush and Lee Vining Creeks is a future
8 flow regime that will bypass the LADWP's diversions.

9 These bypassed flows need to incorporate several
10 important features of the undisturbed flow regime so that
11 aquatic and riparian systems are not only restored in the
12 short-term, but are also sustained in the long-term.

13 I would strongly recommend that three criteria need to
14 be considered:

15 First, some flows must always bypass any irrigation or
16 LADWP diversion structure, and, indeed, every minimum
17 streamflow that will be set for fisheries will probably be
18 more than adequate for what is necessary there, but certainly
19 not lower than what would have happened naturally.

20 Secondly, some consideration needs to be given to
21 ramping constraints, that is the rapidity with which water is
22 brought up and down in these channels, and this should be
23 developed from an analysis of historical hydrographs. These
24 constraints should attempt to prevent excessively rapid
25 changes in flows that might significantly and adversely affect

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1 fisheries.

2 Furthermore, at least in some years, flow recession
3 following a hydrograph peak should occur sufficiently slowly
4 so that the vertical root growth of young plants, particularly
5 willows and cottonwoods, can keep pace with the receding water
6 table.

7 A third, but perhaps most important, component is that
8 some of the natural high flow dynamics need to periodically
9 occur in Rush and Lee Vining Creeks downstream from the LADWP
10 diversions. The occurrence of peak flows within the range of
11 natural conditions is critical for providing disturbance
12 patterns that will cause the restoration of channel
13 morphology, vegetation, and ecosystem functions.

14 These high-flow disturbances not only assist in meeting
15 short-term restoration goals, but are a necessary component of
16 the long-term sustainability of both the aquatic and riparian
17 ecosystems associated with these streams. So dynamics is
18 certainly part of what is necessary.

19 My last set of comments provide a brief assessment of
20 work undertaken by the Restoration Technical Committee, or
21 RTC, and I will attempt to address again a question that was
22 in the Notice of Public Hearing. The question is: "What is
23 the status of work undertaken by the RTC at the direction of
24 the Superior Court in connection with the coordinated Mono
25 Lake Water Right Cases?"

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1 My assessment of the RTC work includes field reviews of
2 Rush and Lee Vining Creeks during the last two years,
3 inspection of aerial photographs, and the reading of reports
4 and recent testimony.

5 Except for the return of continuous flows, the grazing
6 exclusion, and in some cases, for example, in Lee Vining
7 Creek, the rewatering of some depressions, which have been
8 called old channels, I have concluded that the other
9 treatments have often resulted in a significant net loss of
10 riparian functions, have not assisted in the establishment of
11 riparian vegetation, nor have they significantly improved
12 natural habitat conditions for fish and other aquatic
13 organisms.

14 Although the RTC has indicated a desire to reestablish
15 vegetation along these streams, the mechanical treatments
16 imposed on the channel and streamside areas has often retarded
17 natural revegetation.

18 The inability, I would say, of the RTC to understand or
19 correctly predict the rapidity of natural revegetation and its
20 importance to these ecosystems is illustrated in the
21 conceptual sketches of riparian vegetation and channel cross-
22 sections over time, as shown in my Figure 7 in my original
23 testimony -- if I could have that put up on the left. The
24 Figure I am referring to, of course, is in Section 2, page 41,
25 of our original testimony. The figure that is shown on the

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1 top of page 41 is taken from a 1992 report, entitled
2 "Description and Evaluation of Restoration Alternatives for
3 Lower Lee Vining Creek, Mono County, California," that was
4 authored by Trihey, Katzel, English, and Larsen.

5 Alternative One, which is depicted in two locations in
6 this Figure, is meant to represent what will happen to the
7 vegetation and channel if it is left alone.

8 Alternative Two represents what should happen if a more
9 proactive approach to channel modification is undertaken.

10 Please note that Alternative One shows relatively slow
11 growth of streamside vegetation and a wide channel for up to
12 60 years. In actuality, natural revegetation and natural
13 channel changes in both Rush and Lee Vining Creeks are already
14 underway. Channel narrowing is underway, revegetation and
15 growth is prolific.

16 However, where mechanical treatments have been
17 undertaken, for example the dredging and filling of wetlands
18 or the dredging of large pools and placement of spoils, the
19 natural establishment and growth of streamside vegetation has
20 been significantly retarded.

21 Without this vegetation, sediment deposition along
22 stream banks is reduced, and channel narrowing is unlikely to
23 proceed. Furthermore, many of the constructed pools have
24 adversely impacted the natural bedload transport of these
25 streams.

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1 The active intervention approach of the RTC has not
2 only focused on controlling channel morphology by manipulating
3 pools, boulders, and gravels, but also by constraining flows.
4 For example, while emphasizing a desire to rewater "historic
5 channels", the RTC indicates that "It is the intent of the
6 planning team to permanently restrict floodwaters from
7 entering the reoccupied historic channels". And, again, this
8 is a publication of Trihey, et al, in 1992.

9 It would appear that the RTC failed to realize the
10 important interaction of dynamic flow regimes and vegetation
11 in the restoration of these channels.

12 To permanently restrict floodwaters from entering a
13 channel is not restoration; to not allow flows above a
14 particular level because they might scour artificially-placed
15 gravels is not restoration; to destroy the prolific
16 regeneration of riparian plants so that channels can be
17 altered with heavy equipment is not restoration.

18 In summary, although the restoration of Rush and Lee
19 Vining Creeks is generally proceeding very nicely as a result
20 of the rewatering and removal of grazing, structural
21 treatments by the RTC are instead obstructing progress.

22 That really ends my oral testimony, but I would like to
23 add here I realize many of my preceding comments were very
24 brief and may have lost the intent of my not being entirely
25 clear, but because I tried to summarize. But I would be glad

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1 to answer questions relating to any of those.

2 MR. DEL PIERO: Thank you very much. Ms. Cahill.

3 Before Ms. Cahill gets up here and starts to cross-examine, I
4 will have Mr. Tillemans come up and sit with Dr. Beschta.

5 Dr. Beschta, I have one question for you in regard to
6 your qualifications. You indicated that you were serving on
7 a committee established by the National Academy of Sciences in
8 regard to salmonids. Can you tell me how one is selected on
9 that panel?

10 DR. BESCHTA: Well, I have never made the selection, so
11 I can't give you first-hand evidence. All I can give you is
12 my impression.

13 MR. DEL PIERO: How were you selected? Were you
14 nominated by someone or some agency?

15 DR. BESCHTA: The National Academy of Sciences has
16 their own personal staff, and they are charged with a
17 particular topic. The Congressional Delegation gives the
18 topic they want studied to the National Academy of Sciences,
19 and their staff begins to contact people around the country.

20 MR. DEL PIERO: And which Congressional Delegation was
21 involved in the topic on which you were selected?

22 DR. BESCHTA: Mark Hatfield, I believe, from Oregon in
23 this case.

24 MR. DEL PIERO: Thank you very much.

25 (Thereupon Mr. Tillemans was sworn.)

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1 MR. DEL PIERO: Would you state your name for the
2 record?

3 MR. TILLEMANS: My name is Brian Tillemans. I work for
4 the Department of Water and Power.

5 CROSS-EXAMINATION,

6 BY MS. CAHILL:

7 Q Good morning, Dr. Beschta. I am Virginia Cahill,
8 representing the California Department of Fish and Game.

9 Dr. Beschta, I am going to go through some of the
10 issues raised in your direct testimony, even those questions
11 you didn't summarize today.

12 On page two, you put forth as one of your conclusions
13 that a high-flow event in 1938 did not significantly alter the
14 stream channels because residual riparian vegetation was still
15 sufficiently intact to resist erosive forces.

16 Does the fact that the high flows in 1938 failed to
17 alter the streams suggest that the grazing that had occurred
18 up to that time had not been sufficient to affect the
19 stability of the streams?

20 A The grazing was already affecting the stability of the
21 channel. What I said in my testimony is it had not yet
22 changed. As you continued the process in place prior to 1941,
23 you would ultimately have seen significant channel changes
24 occurring in the system, but, as of 1939, there was still
25 sufficient root structure to withstand the high flows in 1938.

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1 Willows and cottonwoods can live a hundred years, so, yes,
2 that vegetation will be around for a long time.

3 Q Was water, to your knowledge, ever diverted from Rush
4 Creek below the narrows?

5 A Yes.

6 Q Is it likely that between the 1938 flood and the
7 beginning of the Los Angeles diversions, the riparian
8 vegetation and stream channels remained stable; in other
9 words, between 1938 and 1941, was there any significant change
10 in the stream channels?

11 A I am not aware of any gross changes.

12 Q Would you conclude that water diversions were a greater
13 factor in the decline of the vegetation and channel
14 degradation than say livestock grazing in the period from 1940
15 to 1989; in other words, between 1940 and 1989, which had the
16 greater impact on the streams, the diversion of water or
17 grazing?

18 A Well, they interact. If I have plants growing, some of
19 those plants would have continued to grow, even though you
20 were taking water out of the system, diverting it, there is
21 certainly some water that gets into the system so those plants
22 would continue to grow, but reestablishing plants would have
23 a tough time, and the grazing would have an impact also. So
24 water is definitely important. If you don't have a lot of
25 water, if it is all taken out, yes, you obviously won't get

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1 plants, but the grazing was having an important impact on
2 establishing plants. They just never had a chance to get off
3 the ground, and those are important.

4 Q Well, in that period, from approximately 1970 to the
5 early 1980's, when, in fact, almost all the water was taken
6 out, wasn't that the primary factor in the decline of
7 vegetation?

8 A Yes, there was, I would believe, substantial loss of
9 vegetation because of the diversion out of the Basin.

10 Q And do you believe that the Rush Creek bottomland can
11 be restored to its prediversion conditions?

12 A Well, this may seem a little bit surprising to you, but
13 I think they may be approaching prediversion conditions or
14 better today.

15 Q What was the width of the riparian forest in the Rush
16 Creek bottomlands prior to diversion?

17 A I never measured that.

18 Q Do you believe the current floodplain vegetation is of
19 the same width and structure as it was prediversion?

20 A Well, when you ask a floodplain question, that's an
21 interesting one, and I haven't seen any measurements which
22 have told me how wide the pre-1941 floodplain was. It's
23 talked about in testimony, but I haven't seen any numbers.
24 There is an existing floodplain occurring in the bottomlands
25 today. It varies. It may be 100 feet or more in some places

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1 and in other places it is very narrow. The concept of the
2 floodplain is not quite the same thing as in a large river
3 system like the Mississippi. These are dynamic systems. They
4 have localized small floodplains, micro-topography all across
5 that bottom.

6 Q Have you examined aerial photographs and noticed the
7 riparian vegetation prediversion?

8 A I examined aerial photographs. I really didn't look
9 for that.

10 Q In your answers here, are you taking into account the
11 incision that has altered the natural floodplain on Rush
12 Creek?

13 A Channel incision has occurred.

14 Q And there has also been groundwater table lowering?

15 A I'm sure that's occurred. It has occurred in other
16 places. The incision of a channel may not have affected it at
17 all. It is not an easy one to extrapolate or project because
18 those water tables underneath that valley are not flat, and we
19 are finding in our research, as you move across an alluvial
20 valley bottom, you find in places where the water regime seems
21 to be in concert with what is happening in the stream and in
22 other places it is operating independently, and, again, the
23 mixture of materials that you have present on that bottom and
24 the ability of channels to move around, I would expect you
25 would have a very similar thing out there. I would not expect

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1 a uniform water table across there.

2 Q You have said you have not actually examined the
3 historical records in any detail?

4 A I didn't say that. I didn't examine them with regard
5 to how wide the riparian zone is.

6 Q So you are unable to conclude that we are now
7 approaching a riparian zone of the same width as the.
8 historical period?

9 A Well, the Draft EIR figures show there has been
10 significant reduction. In my walking around there, I would
11 say, yes, there's been significant loss of plant growth
12 certainly in many areas, but, by the same token, those areas
13 where there has been significant loss of plant growth, many of
14 those are now showing revegetation in willows and even
15 cottonwoods coming back in.

16 Q The cottonwoods coming back in, how close are they to
17 the margin of the stream?

18 A They are right up to the edge in places.

19 Q And was there historically cottonwood growth over a
20 wider area than there is now?

21 A Yes.

22 Q Now how long would it take to restore the area
23 equivalent to natural conditions with mature trees that were
24 lost if you just left it to the natural processes to work?

25 A Will you repeat the question?

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1 Q If you rely entirely on natural processes, how long
2 would it take to approach conditions that were similar to the
3 pre-1941 conditions with a wide floodplain with a wide band of
4 riparian forest?

5 A I am going to have difficulty answering that one in any
6 simple way because in the pre-1941 period the growth of a lot
7 of those plants along the bottoms, there was an incredible
8 amount of water being moved around on the bottomlands. There
9 were ditches taking water out of Rush Creek, there were
10 ditches in the bottomlands moving water around in Rush Creek.
11 There may have been considerable amounts of the area wetted by
12 irrigation pre-1941 that were not natural back there either.
13 So I can't go back to 1941 as my target. What I can argue is
14 that the restoration of a functional system with all of the
15 things that we would argue are working hydrologically and
16 ecologically are already underway, and it's just at a certain
17 stage in its life history, if you will. It's a young stage.

18 Cottonwoods are indeed coming in. I have stood out on
19 the bottomlands of Rush Creek and counted over 30 cottonwoods
20 within a hundred-foot radius right close to the stream
21 channel. They are not always that thick, but they are there,
22 and they are coming in. There are some older cottonwoods 12
23 to 15 inches in diameter that have been broken off which, if
24 I had looked at those a few years ago, I would have said they
25 are dead. They are now regrowing.

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1 So there is a lot of regrowth taking place in that
2 system, and I can't get you magically the large cottonwoods in
3 three or four years, but I can in 15 to 20 years have
4 significant cottonwoods in that system if that is what your
5 target is. If you are after recovery of channels and pools,

6 things like that, it is already happening. There are pools in
7 excess of four feet and a series of those out there. There
8 are spawning gravels recovering in the system, so it's already
9 got a lot of features that I would argue are part of a pre --
10 and I would go back pre-1941. I would go beyond that and go
11 much farther than that -- were indicative of that system prior
12 to any human perturbations. It's already happening.

13 Q At this point, you have stated the cottonwoods are
14 coming up mostly along the margins of the streams?

15 A No, I didn't say that. I said there are some around
16 the margins of the stream. There are cottonwoods that are
17 also occurring farther away from the channel system.

18 Q Are there a significant number of cottonwoods within
19 the historic floodplain, the areas that would have been
20 floodplain in the historic period?

21 A You are going to have to -- again, I am having
22 difficulty with the question about the floodplain. There are
23 cottonwoods that are coming within the historic riparian area
24 of Rush and Lee Vining Creeks, yes.

25 Q Have we had sufficient overbank flows to be

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1 establishing cottonwoods -- how far from the creek are new
2 cottonwoods germinating?

3 A Cottonwoods generally require gravelly substrate and a
4 moisture supply and often will come in profusely after a
5 disturbance, a major disturbance, but they can come in in
6 backwater areas or other places where there is sufficient
7 moisture and the seed comes in at the right time of the year,
8 and so it is possible, and indeed it is occurring. There are
9 places where cottonwoods are occurring away from the existing
10 floodplain, but it is not nearly as common as those which are
11 closer to the stream.

12 Q Are there channels that have not been rewatered that,
13 if rewatered, would support cottonwood growth?

14 A I am sorry, you'll have to repeat that.

15 Q Are there historic channels that have not yet been
16 rewatered that, if rewatered, would support cottonwood growth?

17 A I spent a great deal of time in the last day trying to
18 figure out this question of historic channels, particularly on
19 Rush Creek.

20 I was out on the ground, in fact, yesterday with that
21 particular question in mind, what did the historic channels
22 look like, where were they, and I've also looked at the
23 photographs again. I've looked at the historic aerial
24 photographs, and I guess I would come to the conclusion that
25 what has been called "historic channels" on the Rush Creek

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1 bottomlands is to a large degree a result of irrigation
2 movement of water around those bottomlands and rewatering of
3 areas off to the side of the main channel, so where are the
4 historic channels? The historic channel is really the main
5 stream with braids, with little side tributaries, but not
6 extensive historic channels in regard to channels that are
7 running parallel to the main stream off on the other side of
8 the valley. So the historic channel question is an
9 interesting one.

10 Q And it is true, isn't it, that some of the historic
11 Rush Creek was lost due to the incision?

12 A Oh, I'm sure.

13 Q Let me ask you just briefly about an article on which
14 you are an author, and the article is entitled, "Ecological
15 and Geomorphological Concepts for Instream and Out-of-Channel
16 Flow Requirements," and the authors were Mark Hill, William
17 Platts, and yourself. It appeared in Rivers in 1991. Are you
18 an author of that article?

19 A Yes, I am.

20 Q And the first sentence in the abstract of the article
21 says, "Healthy fish populations are dependent on streamflow
22 regimes that protect the ecological integrity of their
23 habitat." Do you agree with that statement?

24 A Yes, I do.

25 Q The article speaks of four types of flows, including

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1 instream flows, channel maintenance flows, and valley
2 maintenance flows, also riparian maintenance flows.

3 Would you believe that all four of those would be
4 required on the Rush and Lee Vining Creek systems?

5 A The valley maintenance flows is probably the toughest
6 one to say that yes, it is required. We are looking at
7 perhaps major events resiting the system. You have already
8 had major resites in the last 20 or 30 years. I don't think
9 Rush or Lee Vining Creeks need those, but I would argue that
10 the other flows, the channel maintenance flows, the fishery
11 flows, the riparian flows are all, yes, these are part of the
12 system.

13 Q Have you made any attempt to determine what the channel
14 maintenance flows ought to be on either Rush or Lee Vining
15 Creeks?

16 A Not a quantitative number, no.

17 Q Have you made any attempt to determine what the flows
18 ought to be for riparian maintenance?

19 A I have indicated in my written testimony that you need
20 to be thinking about having peak flows occurring at sometime
21 within the range of historical conditions.

22 Q And so did you ever attempt to quantify that and come
23 up with a specific flow?

24 A I quantified the period of record that was available to
25 me.

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1 Table A of my written testimony, 20 years of available
2 record with regard to Lee Vining Creek -- this is on page 38
3 -- 20 years of available record on Lee Vining Creek show an
4 average flow of 263 and a standard deviation of plus or minus
5 125, and on Rush Creek 256 cfs plus or minus one standard
6 deviation of 168 cfs.

7 What I am arguing here for is that that's the historic
8 range. Whoever is setting the flows for those streams ought
9 to be thinking -- at least at some times they ought to be
10 bumping back up into that range again.

11 Q And by "that range" do you mean the average or the
12 average plus the standard deviation?

13 A Within the range of the average plus or minus the
14 standard deviation, and let me clarify further. This is a
15 flow range then. Two-hundred-fifty-six plus or minus 168 is
16 a broad range. I am not suggesting that it should always be
17 256 minus one standard deviation. I am saying it ought to be
18 up within that broader range. There should be high flows,
19 there should be moderately high flows, and there should be
20 lower high flows occurring.

21 Q And how would you determine the duration of those
22 flows?

23 A Those flows don't last very long. These are
24 instantaneous or daily average peaks, so they don't stay up
25 there very long, and they should not be held at those high

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1 levels. They should occur, and then you are looking at
2 ramping up and down from those. And so it's not just simply
3 getting them up there and holding them.

4 You would not want to hold Rush Creek, for example, at
5 a high flow for a month period based on these peak-flow data.

6 Q And in your article in Rivers that we have discussed
7 before, it states: "In the absence of supporting research, we
8 recommend that flows be reduced by no more than ten percent of
9 the previous day's flow, and in most cases a reduction of less
10 than ten percent of the previous day's flow would be highly
11 preferred."

12 Would you recommend that on Rush and Lee Vining Creeks?

13 A If I could have rewritten that sentence in retrospect,
14 I would have said "In the absence of supporting research or
15 local information..." In my written testimony, I talk about
16 utilizing the existing flow records that are available for
17 making that determination.

18 So although I am saying research, I would have loved to
19 have rewritten and say "research and local data." If you have
20 local knowledge, use it. You cannot wait for the research to
21 tell you exactly what to do on Rush and Lee Vining Creeks if
22 you have specific information which is beneficial in making a
23 decision.

24 Q Have you, in fact, determined a ramping rate for those
25 streams other than the ten percent recommended in the article?

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1 A I don't have a recommendation on ramping rates.

2 Q For the record, I would like to point out this article
3 I am referring to has been submitted, and it's DFG-72.

4 My understanding is that your testimony was that you do
5 not believe it is necessary to cap flows at either 60 or 100
6 cfs for geomorphological use; is that correct?

7 A If you want to reestablish plants, if you want to
8 initiate channel-holding processes, if you want pools that are
9 of benefit for fisheries, you should not be capping flows.

10 MS. CAHILL: Mr. Del Piero, I believe I am close to the
11 end of my original 20 minutes. What I would propose would be
12 to apply for a 10-minute extension to be used with Mr.
13 Tillemans on the video and I would ask if we could take a
14 break prior to that because I wasn't expecting to have to do
15 that examination at this time.

16 MR. DEL PIERO: And how much time is there left?

17 MR. STUBCHAER: Three minutes.

18 MS. CAHILL: Let me use the last three then.

19 MR. DEL PIERO: Why don't we take a break, and you will
20 have 13 when we get back.

21 MS. CAHILL: Thank you.

22 (Recess)

23 MR. DEL PIERO: Ladies and gentlemen, this hearing will
24 again come to order. Ms. Cahill, why don't you proceed.

25 MS. CAHILL: Dr. Beschta, you mentioned Table A on page

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1 38 in your report. That table shows the peak average daily
2 flows. It's true, isn't it, that instantaneous peaks might be
3 higher than these?

4 A Yes, it is.

5 Q And if, in fact, the historical record shows that on
6 occasion flows remained on the order of 250 cfs for a month on
7 one of these streams, would you recommend then, from time to
8 time, flows on that range for that duration?

9 A Well, you can calculate an average flow for a month and
10 come up with 250 cfs, but it is unlikely in any stream I am
11 aware of where that flows on a natural way, so you have got
12 days where you are above 200 cfs, above 300 cfs or whatever,
13 so it is fluctuating, and you calculate an average.

14 Now those plants then don't recognize that average
15 flow. They are responding and those channels are responding
16 to the dynamics of the flow regime they create at the 250 cfs
17 average. So, no, I would not recommend holding a 250 cfs
18 flow, even though that's a typical monthly flow for some time
19 of the year.

20 Q If, in fact, though, in the historical record there
21 were flows that were consistently over a particular level --
22 assume that there were flows consistently fluctuating but
23 consistently over 200 cfs for a month. Would you recommend
24 that at least in some years similar flows be used?

25 A I think in some years that would be appropriate, to

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1 have those kinds of flows, yes.

2 Q Thank you. Let me just clarify one thing. On page 29
3 of your report, in paragraph A, on stream rewatering, you
4 mention that in June 1990 Court ordered seasonal minimum flows
5 and flushing flows were established for Rush, Parker, Walker,
6 and Lee Vining Creeks. And then you state, "The return of
7 continuous flows to these streams represents the most
8 important aquatic and riparian restoration activities
9 undertaken in the Mono Basin."

10 You didn't intend to suggest, did you, that those
11 continuous flows have been only those arising from those Court
12 ordered streamflows?

13 A No.

14 Q In fact, you are aware that since approximately
15 December of 1989, the Lake Level Injunction has precluded any
16 export from the Mono Basin, with one exception?

17 A I am not intricately familiar with that, but I
18 understand that, yes.

19 Q So, in other words, in the four years between -- well,
20 in the years between 1989 and 1993 when you have seen such
21 phenomenal growth, there has in fact been no export from the
22 Mono Basin by way of the Los Angeles diversions?

23 A I really have no knowledge of what the export has been.
24 I would have to look at somebody's dates and figures.

25 Q One last question -- given that your opinion that a

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1 stream should work in a holistic fashion, if we were to
2 restore the Rush Creek bottomlands, wouldn't you also
3 recommend that the entire system be maintained so that it
4 could function well?

5 A I don't think I have segregated a specific reach, that
6 I have targeted a specific reach. I have been arguing for,
7 yes, those stream systems.

8 Q I guess actually I lied when I said "last". I have one
9 last set of questions.

10 With regard to Figures 5 and 6, it is true, isn't it,
11 that Figure 6 has been taken from a point somewhat more
12 downstream from Figure 5? Isn't this tree this tree which is
13 clearly closer in Figure 6 than in Figure 5, and this little
14 tuft of vegetation is the same little tuft here?

15 A Yes.

16 Q And, in fact then, these willows are probably these
17 plants -- weren't they already there, and aren't they simply
18 growing?

19 A That's the whole point. 1991 was the first year of
20 nongrazing of the system. I first saw the Basin in April of
21 1992. I was astounded at what one year release from grazing
22 was doing for the system, and it's obviously continuing when
23 you look at the plants on the left-hand side of the channel.
24 They are much ranker. They are coming back again and it's
25 only three years of nonuse.

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1 Q But, in fact, these plants, this plant and this plant
2 and this plant were all present in 1991; is that correct?

3 A May I approach the picture?

4 Q Certainly.

5 A Yes. You can see plants that indeed were established
6 out here and were beginning to start, but notice also the
7 sedges are also coming in here and notice the trapping of
8 fines that is occurring alongside the stream.

9 This channel is beginning to build banks along the
10 side. This channel over here didn't have any and wouldn't on
11 a continuous grazing because the plants were continuously
12 being cropped back.

13 Q In fact, this part, this driest looking part of this
14 Figure isn't included when we've taken this picture from
15 farther downstream. If you can't tell, you don't need to
16 answer. It appears the left margin in Figure 5 is not
17 included in Figure 6.

18 A The left margin may be off. I'm not sure.

19 Q And your mentioning sediments or fines raised another
20 question. Do you know when a dam on Lee Vining Creek was
21 removed?

22 A I believe it was taken out this year.

23 Q Are you familiar with the removal of the dam in October
24 of 1992?

25 A Is this the one above the highway?

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1 Q Yes.

2 A I wasn't around. I really don't know specifically when
3 it was taken out. I just know that in the last year that dam
4 was removed.

5 Q If a dam were removed, wouldn't that be likely to have
6 the effect of releasing sediments that had been trapped below
7 the dam?

8 A Sure, but in comparison with what else we do on that
9 stream system, it is a very, very small component.

10 Q I think we would like now to shift to the video. I am
11 not quite sure how we are going to do this. Dr. Stine has
12 volunteered to run the controls.

13 MR. DEL PIERO: Dr. Stine, do you have a license to do
14 this kind of work?

15 DR. STINE: Sworn by the State.

16 MS. CAHILL: While we are waiting, Dr. Beschta or Mr.
17 Tillemans, do either of you know what the range of flows has
18 been in Rush and Lee Vining Creeks in 1993?

19 A MR. TILLEMANS: I know the summer flows were sustained,
20 I think it was between 160 and 100 cfs for several months at
21 a time.

22 Q Is that in Rush or Lee Vining?

23 A In Rush.

24 Q And what about Lee Vining?

25 A Lee Vining Creek, the natural flows went down Lee

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1 Vining Creek this year, and the peaks kept rising, and it
2 would cool off and it would go down, and I think we peaked --
3 I don't know the exact numbers, but somewhere near 300 cfs,
4 290.

5 Q And let me ask you, have you found those flows to be
6 beneficial or damaging?

7 DR. BESCHTA: A Beneficial or damaging to what?

8 Q To the Stream system as a whole.

9 A This is kind of asking a one-sided question because it
10 is more complicated than that. Having the flows out there has
11 certainly provided a sustained period of growth for the
12 existing plants. The fact that flows have been kept up though
13 indicates that certain plants along the channel, perhaps
14 cottonwoods that we are trying to establish, may have gotten
15 drowned out this year and did not come in, so I don't have a
16 simple yes or no answer on that one.

17 Q But, in fact, the thrust of your testimony has been
18 there has been a tremendous recovery in recent years,
19 including this year?

20 A That's true.

21 VIDEO TAPE: This video shows a comparison of streams
22 at four locations in mid-September, 1987, and mid-September,
23 1993. The September, 1987, footage was shot for the
24 Department of Water and Power by Dames and Moore. The 1993
25 footage was shot in the same location by the Media Resources

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1 Department of the University of California, Riverside.

2 MS. CAHILL: Why don't we stop right here. Mr.

3 Tillemans, can you tell us where you are in this?

4 MR. TILLEMANS: A That's in Rush Creek bottomlands.

5 I think it is referred to as Site 3.4.

6 Q And this appears to be a pool; right?

7 A That is showing the depths that are there. I don't
8 know if you referred to it as a pool, but it is not a typical
9 pool.

10 Q And was that deep area there even prior to this year?

11 A I'm not sure of that.

12 VIDEO TAPE: Also included in the video are scenes shot
13 in May, 1992, and August, 1993, by the Department of Water and
14 Power. For Lee Vining Creek --

15 MS. CAHILL: Q Can we stop just a moment. In that
16 last picture, Mr. Tillemans, do you know what the flow was
17 when that picture was taken, the one showing you wading in the
18 stream?

19 MR. TILLEMANS: A That was in August, and the flows
20 were somewhere probably around the range of 160, 100.

21 Q Thank you.

22 VIDEO TAPE: This site is an example of natural
23 recovery of riparian vegetation since the restoration of flows
24 and the removal of grazing in 1991.

25 MS. CAHILL: Q Do you know what the flow is in this

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1 picture?
2 A The 1987 flows?
3 Q Yes.
4 A Substantially less than there was this year. I don't
5 know. I can't recall right now exactly what they were.
6 VIDEO TAPE: As our point of view shifts to the
7 upstream area, we can see that the entire area is virtually
8 devoid of riparian vegetation.
9 MS. CAHILL: Can you stop here?
10 Q Do you know whether this area had been relatively
11 recently plowed with a road grader to repair damage from the
12 high flows of 1986?
13 A Let's see, that was taken in 1987, and that would have
14 been at least one growing season past that at that time, and
15 there was still no riparian vegetation there, and they may
16 have done construction on that county road crossing in '86
17 because of the high flows in the spring.
18 Q So it is possible that there was -- never mind. Okay,
19 we will continue.
20 VIDEO TAPE: Note the size of the cottonwood tree on
21 the right bank of the creek.
22 MS. CAHILL: Let's stop here.
23 Q If you were in fact to have continued farther to the
24 right, would you have seen additional vegetation?
25 A Yes, I would have.

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1 Q And what is that vegetation in the background, if you
2 could back up just a bit?
3 A Basically cottonwood and willows.
4 Q And they were there in '87.
5 VIDEO TAPE: Note the size of the cottonwood tree on
6 the right bank of the creek.
7 MR. TILLEMANS: A Yes, they were there in '87.
8 MS. CAHILL: Thank you. The tape can go on.
9 VIDEO TAPE: As we look at the same site in September,
10 1993, we can see that there's a great deal of new riparian
11 vegetation. The growth is a result of the rewatering of Lee
12 Vining Creek and removal of grazing.
13 MS. CAHILL: Okay. Can you stop it right here?
14 Q First of all, can you tell me what the flow was when
15 this picture was taken?
16 A What day was this taken?
17 Q Well, according to the tape, it's September of 1993.
18 A The flows in the creek, after we took the video, I was
19 given the absolute flows over there, and I can't recall
20 exactly what they were.
21 Q Okay. And isn't there an area shown in this section
22 where, in fact, the vegetation has not come back in?
23 A Would you be more specific.
24 Q Well, for example, along the right bank of the stream?
25 A In the upper slope there?

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1 Q Yes, or right down to the water's edge. You don't see
2 the same type of growth over there that you saw in the earlier
3 portions of this particular segment.

4 A That site there does have some herbaceous growth and
5 there's some smaller clover and other herbaceous species
6 coming in along the banks.

7 Q But you don't see any large-scale or two- or three-
8 year-old cottonwoods or willows?

9 A No. I might add that in 1991, and a couple of previous
10 years, we had some problems at this site. In fact, there were
11 complaints about bands of sheep in the floodplain, and, on
12 further investigation, we found out that a U. S. Forest
13 Service permittee was running his sheep down from the Conway
14 Summit area and felt that it was okay for him to run sheep in
15 Lee Vining Creek without asking anybody. And so even though
16 we had a grazing moratorium going on, this site was heavily
17 grazed.

18 Q I'm assuming that the far bank is on the other side of
19 Lee Vining Creek from the Conway area; is that right? Do you
20 know for a fact that sheep crossed the stream here and grazed
21 on that far bank that we are looking at?

22 A Yes, I do.

23 Q How many?

24 A At least -- a band runs anywhere, depending on the
25 year, from a thousand to two thousand sheep.

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1 Q And for how long?
2 A He kept his sheep in there several days at a time. We
3 also had a sheep crossing in which the sheep lessees are
4 allowed to cross the creeks at certain specific sites and not
5 allow grazing in the floodplain, but he is allowed to move
6 sheep through, and when they do move sheep through, they are
7 supposed to push them through and not allow any grazing. But,
8 of course, there's always incidental grazing occurring.
9 Q So the fact there is grazing in one location doesn't
10 necessarily mean it is happening up and down the whole
11 stretch?
12 A When you are referring to "stretch", which part?
13 Q Let's say this entire reach.
14 MR. DEL PIERO: Your time is up. You had requested
15 extra time.
16 MS. CAHILL: I would request additional time to go
17 through the video.
18 MR. DEL PIERO: Granted.
19 MS. CAHILL: Thank you. We can continue.
20 VIDEO TAPE: Note substantial growth of the cottonwood
21 tree on the right bank. The tree shades the stream and
22 provides shelter and cover for fish --
23 MS. CAHILL: Stop here.
24 Q Now this cottonwood is on the north or south bank of
25 the stream?

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1 A It is on the Lee Vining side of the stream, which
2 probably is referred to as the north.

3 Q And so, in fact, the sun is going to be coming from the
4 left side of the picture; isn't that right? So most of the
5 shade would be cast onto the land, not on the stream?

6 A In the early morning light, yes, but in the afternoon
7 that would change.

8 Q Basically, most of this stream section is still
9 unshaded; is it not?

10 A I wouldn't say that. I walked that creek quite a bit,
11 and as soon as you head upstream, or, for that matter,
12 downstream --

13 Q I am referring to right here. Right here is there
14 anything that would cast significant shade on this stretch of
15 the stream?

16 A As a matter of fact, it would because one of the best
17 pools on Lee Vining Creek is right there, and that tree shades
18 it and reduces light for fish and produces some cover for them
19 and also, if there's any fish in there, it provides protection
20 from kingfishers or blue heron or something else.

21 Q This was a preexisting tree. This is not due to the
22 restoration effort?

23 A Yes, but there is a lot of herbaceous growth appearing
24 below it and on the other side of it.

25 Q And even though it does shade a portion of the channel,

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1 that is only really a small portion of the channel that we see
2 here.

3 A Yes, and I might add that was just due to the filming
4 constraints and time we had. Rather than visit the whole
5 creek, it was just to illustrate what is happening as trees
6 grow.

7 MS. CAHILL: Thank you. We can go on.

8 VIDEO TAPE: To capture the full extent of
9 revegetation, this site was reshot at an elevation of
10 approximately 13 feet above ground level. It allows
11 comparison of the vegetation regrowth more clearly. It is
12 clear that the reestablishment of flows and the removal of
13 grazing have caused great resurgence of riparian vegetation
14 along this stream and floodplain.

15 MS. CAHILL: Let's halt right here.

16 Q You say "along the stream and floodplain". In this
17 picture, do we see the vegetation primarily along the stream,
18 or is there significant new growth in the floodplain?

19 A I think in this picture you see the growth happening
20 primarily around the stream. I think Dr. Beschta would best
21 be asked this question because I am not a geomorphologist. My
22 impression is when herbaceous growth comes in and starts
23 trapping sediments, there is a successional process that
24 occurs, and sets the seedbed for willows and cottonwoods, and,
25 in the future, you would expect this to turn into a riparian

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1 site.

2 Q What we are seeing now is herbaceous plant life right
3 along the margin of the stream?

4 A Right, and I must add that we are running into
5 seedlings again, and while there was a grazing moratorium,
6 that was not adhered to, as I previously explained.

7 Q All right. We can continue.

8 VIDEO TAPE: The side-by-side comparison of the left

9 bank upstream of the county road crossing illustrates the
10 deposition of fine materials necessary for bank building.

11 MS. CAHILL: Q And again we have already asked, but
12 let me ask you, Mr. Tillemans, are you familiar with the

13 removal of the dam on Lee Vining Creek?

14 A Yes, I am.

15 Q And would that, in fact, have provided more fine
16 sediments than might have been there otherwise?

17 A In talking with people dealing with sediment transport,
18 they told me it is very insignificant.

19 MS. CAHILL: Let's continue.

20 MR. DEL PIERO: Excuse me, how long was that dam in?

21 A The Lee Vining Dam?

22 MR. DEL PIERO: Yes.

23 A Historically, it was put in there by the Sierra Pacific
24 Power Company in the early 1900's. It had been there quite a
25 while.

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1 MS. CAHILL: Q Mr. Tillemans, can you tell me
2 approximately what the flow was when this picture was taken?

3 A Again, I'm not a hydrologist, and the flow figures are
4 not something I remember too exactly, and I can tell you that
5 if that was in August, it was still fairly high, and I am not
6 quite sure what the flow was.

7 Q In order not to take up too much time, if you have any
8 fast forward feature, we might fast forward to the Rush Creek
9 portion of the tape, and, in the meantime, Mr. Tillemans, you
10 have had a picture of the Lee Vining delta, and the text
11 stated that the delta wetland would be inundated at higher
12 lake levels. Do you know at a lake level of approximately
13 6,400 feet how much new wetland might be created in the Lee
14 Vining delta?

15 A I couldn't tell you that.

16 Q Thank you. Mr. Tillemans, when was this taken?

17 A There is sparse vegetation. This was taken, to my
18 knowledge, in September of 1987 by Dames and Moore.

19 Q And do you know what the flow was at that time?

20 A It is stated on the film, but as far as remembering the
21 figures, I am looking more from a standpoint of how high flows
22 and low flows and everything functions in the stream, but,
23 again, when it comes to exact figures, I think the video said
24 there was somewhere around 100 cubic feet per second,
25 and in Lee Vining

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1 Creek it was somewhere around 120.

2 Q Okay. On September 19, 1987 --

3 MR. DEL PIERO: Excuse me, do you think that's 100
4 cubic feet per second? Is that what your testimony is, sir?

5 A I couldn't tell you exactly. As I said, I am not a
6 hydrologist, and I know from the dates that these videos were
7 taken, I asked when I did the video that they give the flows
8 for those --

9 MS. CAHILL: Q According to DWP Exhibit 488, the
10 flows in Rush Creek would have been 19 cfs on September 19,
11 1987. Does it appear to you, however, that there's more than
12 19 cfs in this picture?

13 A Again, you are asking the wrong person.

14 MS. CAHILL: All right, we can continue. Thank you.

15 VIDEO TAPE: Also note the significant live vegetation
16 on the upstream gravel bar.

17 MS. CAHILL: Q Mr. Tillemans, was there some overbank
18 flooding that allowed that vegetation to get established up
19 there?

20 A There could have been, but willows will establish --

21 VIDEO TAPE: -- and begun to form in this untreated
22 portion.

23 A -- willows will establish independent of overbank
24 flows, also cottonwoods will. If they release their seeds and
25 there's enough water table and there's moist ground, willows

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1 will establish.

2 MS. CAHILL: Q This water that you are wading in
3 here, do you know what the depth of that portion of the stream
4 was in 1987?

5 A In 1987, no, I was not there in 1987.

6 MS. CAHILL: We can continue now to the portion that
7 deals with the Rush Creek delta.

8 VIDEO TAPE: This site, in 1987, was taken about one-
9 half mile from the shore of Mono Lake and looks out across the
10 delta from a high stream bank. In 1987, the stream was a
11 wide, unconfined channel, and no riparian vegetation is
12 apparent.

13 MS. CAHILL: We can stop here for a moment.

14 Q The condition of that channel was partly related to
15 some large flood events on the stream; is that right?

16 A Yes, that's my understanding.

17 MS. CAHILL: All right, please continue.

18 VIDEO TAPE: I saw grazing was removed.

19 MS. CAHILL: Q We are none of us recommending this;
20 are we?

21 A As far as what?

22 Q This type of condition.

23 A No.

24 Q On the banks.

25 A No, and it's not in that condition today.

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1 VIDEO TAPE: In 1993, this stream reach is well
2 vegetated and has begun to narrow and deepen. The riparian
3 system is now interacting with the channel.

4 MS. CAHILL: Let's halt here.

5 Q Now, are you confident that the establishment of the
6 riparian vegetation we see that is causing the channel to
7 widen and deepen, as opposed to another cause such as incision
8 or geomorphological processes regarding erosion caused by the
9 force of the water?

10 A I think you misstated it, widened and deepened. What
11 has begun there is that the vegetation --

12 Q Narrowing.

13 A -- is narrowing of the channel and with successive
14 deepening as that process continues.

15 Q So at this point in time, the vegetation has not caused
16 any deepening of the channel?

17 DR. BESCHTA: Can I answer that?

18 MS. CAHILL: Yes.

19 A The vegetation is already interacting with the channel.
20 There is increasing sinuosity occurring out there, and I know
21 this is tough looking into the future, but, as I look at that
22 stream, you are going to see deepening of the outside meander
23 bends. It's already happening out there today.

24 Q Well, I'm not looking to the future, I am focusing on
25 what's there now, and the text said it has begun to narrow and

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1 deepen. Has there been significant deepening to date caused
2 by the riparian vegetation?

3 A In this channel?

4 Q In this channel.

5 A This channel is firming up and indeed is beginning to
6 deepen in locations. Pools are beginning to develop, yes.

7 Q And is that due primarily to the vegetation or to
8 stream incision or the work of flows in the stream?

9 A Well, this is down in the delta, which underwent
10 massive incision years ago back in the 60's and was reworked
11 again in the 80's. There was a lot of sediment moved around
12 out there.

13 Then, in more recent years, the flows have been put in
14 place, and there has been a moratorium on grazing. The
15 vegetation has come back in, so you have got three years of
16 growth out there. The vegetation is already tightening down
17 the base, and indeed you are beginning to see deep areas
18 develop.

19 Q Are you telling me that it's the vegetation that's the
20 primary cause of that deepening?

21 A Well, I can't separate vegetation from flows. They go
22 hand in hand. I can't get flows without either one -- well,
23 if you just run water in the channel without any vegetation at
24 all, which is kind of what we had for a long period of time --
25 I read the testimony, and I read the reports, and they were

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1 telling me there were no flows, that it was a very shallow
2 stream system out there, and I would agree, you have cobbles,
3 sand, and very few pools. I can go out there today and find
4 pools in the bottomlands of three to four and a half feet or
5 deeper. I can see the beginnings of pools out there, and
6 there's interaction between flows and vegetation. I cannot
7 separate them.

8 Q I just didn't want us to be overstating the effect of
9 the vegetation we see here. It seems unlikely that in a two-
10 year period that vegetation would by itself have caused
11 significant deepening.

12 A I don't know what you mean by "significant". I was
13 saying that it is already having an impact out there. If you
14 want four- to five-foot pools out there, you are going to have
15 to wait a while, but they are coming.

16 Q And then, let's go to the last shot on the video.

17 MR. DEL PIERO: Your time is up.

18 MS. CAHILL: I have just one last question. I would
19 like to get to that last side-by-side comparison.

20 VIDEO TAPE: The side-by-side comparison --

21 MS. CAHILL: Right here.

22 Q Throughout this there has been better color in the 1993
23 photos than in the 1987 photos. Do you know if there was a
24 blue filter used when the '93 footage was shot?

25 MR. TILLEMANS: A I have no idea.

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1 MS. CAHILL: Thank you. I have no further questions.

2 MR. DEL PIERO: Mr. Dodge.

3 MS. CAHILL: At this time, if I may, I would note that
4 Mr. Birmingham has joined us, and I would like to yield my
5 part on this to him.

6 MR. DEL PIERO: Aren't you lucky, Mr. Birmingham?

7 MR. BIRMINGHAM: Maybe I could leave.

8 MR. DODGE: I would like to start with the video.

9 MR. DEL PIERO: Before you start, Mr. Dodge, I need to
10 advise you of something. The State Water Resources Control
11 Board has a matter scheduled at 11:30 today, so you have
12 exactly 20 minutes. If you go over that 20 minutes, we may
13 have to continue this after lunch. Why don't you proceed.

14 MR. DODGE: What I would like to do then is do my
15 portion on the video and then break.

16 MR. DEL PIERO: Fine.

17 CROSS-EXAMINATION

18 BY MR. DODGE:

19 Q If we could start at about 400 on that counter, I will
20 try to go through this quickly.

21 VIDEO TAPE: Let's face the deposition of fine
22 materials necessary for bank building.

23 MR. DODGE: Let's stop right there.

24 Q The question to both of you is: Would you agree that
25 the Los Angeles Department of Water and Power Dam on Lee

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1 Vining Creek limits the amount of fine material that goes down
2 Lee Vining Creek?

3 DR. BESCHTA: A I don't know what the operation of
4 that dam was. I didn't know whether they could bypass
5 sediment from that structure or not. It's a fairly small
6 storage reservoir.

7 Q So you don't know whether it could bypass sediments?

8 A I'm trying to think what it looked like before they
9 took the dam out, and I don't remember now whether there was
10 a bypass structure off to the side --

11 Q I am talking about the Los Angeles DWP Dam on Lee
12 Vining Creek.

13 A Oh, the diversion structure.

14 Q Yes. Did that limit the amount of fine sediment that
15 goes down Lee Vining Creek?

16 A That would.

17 Q Now, we have heard talk about the other dam being
18 removed which, in fact, happened in October, 1992. I believe
19 it was the Lee Vining Public Utility District Dam. And there
20 was a question Ms. Cahill asked you about fine material shown
21 on the video resulted from removal of that dam. Do you recall
22 that question?

23 A I recall the question, yes.

24 Q And I believe you testified that the fine sediment
25 resulting from the removal of that dam was a small component

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1 of what was available in Lee Vining Creek. Do you recall that
2 testimony?

3 A Yes.

4 Q What calculations have you made in that regard?

5 A I don't have the numbers. I was on the site, and I saw
6 the dam that was removed, and I did some preliminary
7 calculations on the number of cubic yards that came out of
8 there, and then, in my walking the stream and looking at the
9 pools that were filled with fine sediments, not the pools, the
10 off-channel actually, but in looking at this fine sediment
11 that was being stored along there, the numbers were just too
12 different ballparks. What came out of the dam was a small
13 amount. What I was seeing along Lee Vining Creek, there was
14 more fine sediment there.

15 Q Can you give us any specifics as to the number from the
16 dam?

17 A I don't remember those. I did a quick calculation in
18 the field, but I don't recall it.

19 Q Mr. Tillemans, you testified that you had been told
20 that the amount of fine sediment that came from the Lee Vining
21 Dam was "very insignificant". From whom did you hear that?

22 MR. TILLEMANS: A That's basically being on the
23 Creek with Dr. Beschta and Dr. Platts, who is a fluvial
24 morphologist also.

25 Q In fact, Dr. Beschta, one of your written

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1 recommendations is to consider a sediment bypass at the Los
2 Angeles DWP Dam; isn't that right?

3 DR. BESCHTA: A That is true.

4 Q So you think that the stream potentially suffers from
5 the lack of fine material; isn't that right?

6 A No -- well, you've got a diversion structure out there
7 on a system that has the potential if you are retrieving
8 sediments -- I'm looking long-term. That was a long-term
9 recommendation, but that structure, if that structure is going
10 to be there for the next hundred years, you have the
11 capability of stored sediments, cleaning it out, storing
12 sediment, cleaning it out, and, in essence, not allowing
13 anything to go downstream, and it seemed to me that if it is
14 possible and prudent, I would certainly recommend bypassing
15 the sediments past the structure into the main channel so that
16 they could remain part of the natural system, and that's what
17 I was suggesting.

18 MR. DODGE: You can roll the tape.

19 VIDEO TAPE: Immediately downstream of the county road,
20 there is a portion of Lee Vining Creek where the recovery of
21 riparian vegetation has been dramatic, as demonstrated by
22 these scenes. As vegetation has recovered, multiple channels
23 have formed and begun to narrow.

24 MR. DODGE: Stop right there.

25 Q You say, Mr. Tillemans, that as vegetation has

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1 recovered, multiple channels have formed. What evidence do
2 you have that those multiple channels didn't exist prior to
3 the riparian vegetation recovering?

4 MR. TILLEMANS: A Being out there on the site and
5 seeing what has been going on over the last several years.
6 Every time vegetation has come in, it is very apparent that
7 multiple channels form and remain. During high flows for very
8 short periods, multiple channels may come in here and there,
9 but the key to sustaining multiple channels would be the
10 recovery of vegetation from what I have seen in the last
11 couple of years.

12 Q Didn't those multiple channels exist prior to the
13 riparian vegetation recovery?

14 A Could you be specific on which area?

15 Q Lower Lee Vining Creek, the area we were looking at at
16 approximately 420 on that tape.

17 VIDEO TAPE: The basin has recovered. Multiple
18 channels have --

19 MR. TILLEMANS: A Well, I guess my answer to that,
20 there were multiple channels now that the vegetation has come
21 back. There has also been one channel that has been rewatered
22 permanently by some of the restoration measures, but the
23 majority of the multiple channels have occurred since the
24 vegetation has come back.

25 MR. DODGE: Q Well, in fact, Lee Vining Creek has

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1 received higher flows than it has in the last 50 years; isn't
2 that right?

3 A Not in the last 50 years, but in the recent past.

4 Q You're not suggesting, are you, that the vegetation is
5 causing channels to form?

6 A Again, I am not a geomorphologist, but, from what I
7 understand and from what I have observed every time I see
8 vegetation coming in substantially, it leads to multiple
9 channels. It traps debris, it traps vegetative material, it
10 causes deflection, and the process of multiple channels seems
11 to be accelerated.

12 MR. DODGE: Let's go up to about 650 if we may.

13 VIDEO TAPE: The Lee Vining Creek delta also provides
14 important wetland and waterfowl habitat. This footage shows
15 Lee Vining Creek delta in August, 1993. The depicted lake
16 level is approximately 6,375 feet. Most of this delta wetland
17 will be inundated at higher lake levels.

18 MR. DODGE: Q Now let me ask you, sir. You were
19 asked what the wetlands would be at approximately 6,400 feet.
20 Do you recall that question?

21 A Yes.

22 Q Have you read Dr. Stine's testimony on that point?

23 A I haven't read Dr. Stine's testimony in great detail,
24 no.

25 Q Dr. Beschta, have you read his testimony on that point?

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1 DR. BESCHTA: A I have read his testimony, but I am
2 not sure --

3 Q I am curious about the amount of wetlands that will be
4 at the Lee Vining Creek delta at elevation approximately 6,400
5 feet.

6 A I haven't made that calculation.

7 Q Can you give the Board any idea what the figure would
8 be?

9 A I haven't done the calculation.

10 Q Do you know it is substantially greater than it is
11 today?

12 A I believe it is greater than what the elevation is
13 today.

14 Q My last point, and I will leave this video alone if we
15 can go up to about 1,100, please.

16 VIDEO TAPE: In 1993, this stream reach is well
17 vegetated and has begun to narrow and deepen. The riparian
18 system is now interacting with the channel. This natural
19 recovery has occurred without artificial restoration.

20 MR. DODGE: Let's stop there. This question can be
21 addressed to either of you.

22 Q Now Ms. Cahill was asking questions about the deepening
23 of the streams related to riparian vegetation. I want to ask
24 you questions relating to the alleged narrowing of the stream
25 due to riparian vegetation.

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1 Now, Mr. Tillemans, what is the basis for your
2 conclusion that the narrowing resulted from riparian
3 vegetation as opposed to incision?

4 MR. TILLEMANS: A If you notice in the video, I said
5 "has begun to narrow and deepen," and again I am basically
6 coming from a functional standpoint on what you see happening
7 out there. In terms of riparian vegetation coming back, it
8 was in a very short period, and it had begun to confine that
9 channel, rather than what you saw in the 1987 photo. It has
10 fanned out and is hanging over in various areas, and so it is
11 more of the beginning of that process occurring and what's
12 going to continue in the future as far as succession.

13 Q What was the level of Mono Lake in 1987?

14 A I don't know that.

15 Q It was substantially higher than it is in 1993;
16 correct?

17 A Yes, probably.

18 Q Does that suggest to you that the narrowing might have
19 been a result of incision?

20 A I think you should probably ask Dr. Beschta, a
21 geomorphologist.

22 MR. DODGE: Fine.

23 DR. BESCHTA: A You may be getting some incision
24 right at the base of the delta. You have to keep in mind that
25 you are in the delta deposit right there, and indeed, as the

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1 lake goes up and down, you may see some incision taking place.
2 That's a dynamic piece of stream, and it is in the very early
3 stages of revegetation in that particular system, so some of
4 the deepening, yes, could be due to some incision occurring on
5 the delta. Some of it could also be due to natural channel
6 processes at work operating with the vegetation.

7 Q And if I ask the same question on narrowing, would your
8 answer be the same?

9 A Incision and channel narrowing is an interesting
10 question. The immediate response of the system when incision
11 takes place, you end up with a deep, narrow channel. That
12 doesn't last very long. The delta here is a good example.
13 Most systems incised back in the early 60's and early 80's.
14 They went down several feet, and they took out tremendous
15 volumes of sediment across that delta. Now that was incision,
16 but notice there was an incredible lateral component to it.
17 So incision and narrowing don't go together; short-term, yes;
18 long-term, no.

19 Q Short-term, yes; long-term, no -- I am interested in
20 the comparison between 1987 and 1993 and the suggestion that
21 this channel has narrowed due to riparian vegetation, and my
22 question is: Isn't it a fact that during that six-year time
23 period it narrowed due to incision?

24 A I don't think that is a fact.

25 Q How much did Mono Lake go down during that six-year

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1 period?

2 A I don't know, I don't have those numbers.

3 Q If you don't know, how can you have an opinion as to
4 whether the incision was the cause?

5 A Let me look at the chart. You asked me how much it
6 went down?

7 Q I am trying to get the basis for your opinion, sir.
8 I'm asking you whether you know how much Mono Lake went down
9 during that timeframe?

10 A If you want a specific number, I have seen the lake
11 level numbers. If I can look at those, I would be glad to
12 tell you. I don't remember what they are.

13 MR. DEL PIERO: Mr. Dodge, I'm going to break it off
14 right here. We are going to come back, and in that period of
15 time, perhaps you could find in your record the lake levels of
16 Mono Lake so Dr. Beschta can more familiarize himself with the
17 lake levels.

18 We will be in recess until 1:30.

19 (Noon recess.)

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1 MONDAY, NOVEMBER 8, 1993, 1:30 P.M.

2 ---oOo---

3 MR. DEL PIERO: Ladies and gentlemen, this hearing will
4 again come to order.

5 When last we left, Mr. Dodge was cross-examining the
6 two witnesses. Please proceed, sir.

7 As I recall, Mr. Dodge, you have 23 minutes.

8 MR. DODGE: I'll do the best I can.

9 MR. DEL PIERO: Before you begin, I would point out
10 that the justification for extension of time, as previously
11 articulated so well by Mr. Birmingham, related to the number
12 of individuals who were then appearing on the panel, may not
13 necessarily have direct application, particularly inasmuch as
14 Los Angeles Water and Power has chosen to divide everybody up
15 into individualized presentations. I guess it works out so
16 that everybody gets the same amount of time. They just don't
17 necessarily get extensions of time in terms of cross-
18 examination, without some greater showing than multiple
19 individuals on the panel. Okay.

20 Please proceed, Mr. Dodge.

21 CROSS-EXAMINATION, CONTINUED

22 BY MR. DODGE:

23 Q When we left we were talking about the possibility that
24 incision leads to the narrowing of the channels between 1987
25 and 1993, and have you had a chance to review the drop in lake

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1 levels, Dr. Beschta?

2 DR. BESCHTA: A I have had a chance to look at the
3 Draft EIR, which only goes to 1990, but I am informed that the
4 lake level as of 1993 is 6,375.

5 Q So there was in fact a drop in lake levels from 1987 to
6 1993, something in excess of four feet; correct?

7 A I'm not sure it was that much.

8 Q Well, assume with me that it was slightly in excess of
9 four feet. Would you agree with me that the incision, rather
10 than the growth of riparian vegetation, led to the narrowing
11 of this channel?

12 A No, I wouldn't necessarily agree, and I have to qualify
13 a bit here. It depends where I am at in the system. If I am
14 sitting right down along the lake and I drop the lake, it is
15 entirely likely that indeed the channel would incise, cut
16 down. If I am some distance upstream, those same effects
17 aren't felt all the way upstream, so it begins to shift gears
18 as you move upstream.

19 Q I am asking you about Rush Creek near the delta which
20 was pictured on your video.

21 A For example, these pictures we have behind us are of
22 the delta.

23 MR. DEL PIERO: Actually, Dr. Beschta, he was referring
24 to the video. If you would like it turned back on -- it's a
25 reference you had in your video to the delta.

00071

1 DR. BESCHTA: Let's go back to the picture then.

2 MR. DODGE: It's roughly 1,100, I believe.

3 (After locating the picture)

4 Okay, let's hear this.

5 VIDEO TAPE: The riparian system is now interacting
6 with the channel. This natural recovery has occurred without
7 artificial restoration.

8 MR. DODGE: Q Now you heard Mr. Tillemans talk about
9 narrowing and deepening, Dr. Beschta. My question really is
10 quite a simple one: Isn't it a fact that the narrowing at
11 that section resulted from incision rather than from riparian
12 vegetation growth?

13 DR. BESCHTA: A No, I would say not at that section.
14 We have some blowups on the floor of that section, still
15 pictures, and you can see pretty clearly that vegetation is
16 indeed tightening that channel up.

17 Q At the point that we were looking at on that video, how
18 much has the bed of the creek fallen as between 1987 and 1993?

19 A I haven't measured that.

20 Q Assuming hypothetically it was approximately two and a
21 half feet, would that suggest to you that it was due to
22 incision -- would that suggest to you that the narrowing of
23 the channel resulted from incision rather than from growth of
24 riparian vegetation?

25 A Well, these are systems with several variables going on

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1 at the same time. If indeed you got incision, let's say,
2 taking place down right adjacent to the lake, that is one
3 process. You've got a flow regime coming through there, and
4 you have revegetation taking place at the same time. They are
5 all working at the same time. To pull one of those out and
6 say "this is the cause," I am having a real tough time saying,
7 yes, there is a specific cause for that, although, for me, the
8 vegetation is playing a very predominant role in this reach
9 the way it is tightening up this channel.

10 Q The last question on the video, Dr. Beschta -- I asked
11 Mr. Tillemans about Lee Vining Creek near the county road, and
12 I asked him a series of questions as to whether the riparian
13 vegetation had caused the creation of new distributary
14 channels in Lee Vining Creek or whether rather the riparian
15 vegetation had grown up around existing tributaries. Do you
16 recall those questions?

17 A In a general sense, yes.

18 Q Do you have an opinion on that subject, sir?

19 A Well, you are at a road location, and, as Mr. Tillemans
20 indicated, that is also the place where you have sheep going
21 through. You have a disturbed area. It is not a natural
22 channel in the sense that the channel is creating necessarily
23 all of its own channels. There are other things going on, but
24 it could well be those were separate channels where the
25 vegetation indeed is growing up.

00073

1 Q Let me ask you a few questions about your direct
2 testimony, sir, as it relates to restoration. What do you
3 understand to be the goal of this license amendment
4 proceeding?
5 A This proceeding?
6 Q Yes.
7 A To figure out what to do with water in the Mono Basin.
8 Q And specifically as it related to stream restoration,
9 do you have an understanding of what the goal is?
10 A Well, I have seen in various reports the objective of
11 returning back towards pre-1941 conditions, as if that's the
12 part that people are shooting for.
13 Q On page 22, you talk about the impacts of grazing and
14 diversions do not preclude the restoration of the functional
15 streams and riparian systems. Do you see that, sir?
16 A That's true, I wrote that.
17 Q What is a "functional" stream?
18 A That's a stream that does the kind of things that I was
19 talking about this morning. It's able to meander, able to
20 store sediments, able to have spawning gravels. It provides
21 long-term and short-term storage of water, processes
22 nutrients. It's got organic matter coming in, and so there's
23 a lot of ecosystem processes going on.
24 Q It's not necessarily the same as restoration of a pre-
25 diversion stream; is that correct?

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1 A You can't go back to the prediversion streams. That's
2 what seems to be a little bit ironic about wanting to go to
3 pre-1941, in that the streams then were already being altered,
4 and since then those channels have changed dramatically, so if
5 you are trying to get exactly back to where you were prior to
6 1941, you have to go back and install some land-use impacts.
7 Q All I am trying to establish with you, I think, is the
8 obvious, that the functional stream is not necessarily the
9 prediversion stream; isn't that correct?
10 A I cannot create prediversion streams.
11 Q Now, would you agree that -- you have obviously a very
12 impressive resume' in a whole variety of fields. You have no
13 particular background in brown trout habitat; is that right?
14 A I am not an expert in brown trout.
15 Q In fact, the blurb next to your picture here doesn't
16 mention fisheries at all; does it?
17 A It doesn't.
18 Q And I tried to go through this long list of
19 publications you have, and they don't relate to brown trout
20 either.
21 A Well, they relate to fish habitat.
22 Q Not to brown trout.
23 A I have worked with brown trout streams in Montana.
24 Q Which of these publications relates to brown trout
25 habitat?

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1 A None specifically.

2 Q You are not a fisheries biologist; are you?

3 A No, I'm not.

4 Q In your written testimony, did you consider the
5 limiting factors on brown trout as they relate to a possible
6 restoration program?

7 A Many factors is an interesting concept which has been
8 used a lot in the fisheries arena by fisheries biologists, and
9 I work with a lot of fisheries biologists. That's a concept
10 that I would suggest going through fairly substantial
11 transitions today with regard to its role in local streams.
12 If you are looking at a degraded stream system, it is easy to
13 step into a limiting factor approach.

14 If you are looking at trying to reestablish a
15 functioning stream system that has many things happening out
16 there, many processes, the concept of limiting factors begins
17 to fall apart.

18 Q It is not a concept that you used in preparing your
19 direct testimony?

20 A I did not look at individual limiting factors as a
21 concern. I looked at the system.

22 Q I think it is fair to say you have been fairly critical
23 of the restoration program to date, and I would like to ask a
24 few questions about that.

25 If you will look at the bottom of page 39 of your

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1 testimony, let me just quote, because it will be the basis of
2 some of my questions:

3 "With the exception of rewatering historic channels
4 along Lee Vining Creek and removing grazing from Rush and Lee
5 Vining Creeks, I would conclude that none of the other
6 treatments have caused a significant net improvement in
7 riparian functions, have assisted in the establishment of
8 riparian vegetation, or have significantly improved fish
9 habitat."

10 Do you see that, sir?

11 A Yes, sir.

12 Q Now historical channels have been rewatered on Lee
13 Vining Creek; correct?

14 A I have been looking at the photographs on Lee Vining
15 Creek, and particularly the 1929 photos and the 1940's and I
16 have been reading over the years and hearing about this idea
17 of historic multiple channels across the bottom, and that's an
18 interesting one.

19 And so, as I looked at those, I am trying to look at,
20 is that really what's happening out there, so when we talk
21 about historic channels, an historic channel to me is
22 generally the mainstream channel.

23 Q Well, let me ask it another way, sir. The Restoration
24 Technical Committee has rewatered channels on segment 3 of Lee
25 Vining Creek; correct?

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1 A That's true.

2 Q Do you recall being out on the stream in June of 1992
3 and telling people that you did not recommend the rewatering
4 of those channels?

5 A That is true, in the field I think I said that.

6 Q And do you now think that was a good idea or not?

7 A It's a mixed bag. You have obviously done some good
8 things for riparian vegetation, but if you think you are
9 growing fish habitat there, then I would suspect not.

10 Q You say that none of the treatments have assisted
11 riparian vegetation. Are you aware of the plantings done by
12 the consultants in the spring of 1993 on Lee Vining Creek?

13 A Yes, I am.

14 Q And have you followed up on the results of those
15 plantings?

16 A I have not seen this year's results. I have heard the
17 numbers for the first year, but I don't remember those, but I
18 haven't seen results for this year.

19 Q We are in 1993; aren't we?

20 A That is true.

21 Q It was done this spring; correct?

22 A I am sorry, I thought you were asking about the earlier
23 ones, 1991.

24 Q You are telling us there were plantings in 1991 along
25 Lee Vining Creek?

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1 A I am sorry, I got confused with the years. Please ask
2 me and I will do my best.

3 Q I want you to assume in the spring of 1993 there were
4 plantings of cottonwoods and willows along Lee Vining Creek,
5 and I asked you whether you had seen the results of those
6 plantings?

7 A I misread your question. I was thinking of earlier
8 plantings.

9 Q Your testimony is that there were earlier plantings?

10 A Yes.

11 Q Let me focus on the plantings in the spring of 1993.
12 How have they done?

13 A I haven't assessed those.

14 Q You don't know whether the planting team work has
15 assisted vegetation on Lee Vining Creek?

16 A I think it's premature for anybody to know because the
17 first year or even second year means nothing in regard to
18 planting of riparian vegetation. So even if I had the
19 numbers, I'm not sure I would know what to do with them at
20 this point in time.

21 Q You go on to say that: "The RTC work has not
22 significantly improved fish habitat."

23 Can you tell me the basis for that testimony?

24 A I first saw the work that was going on in 1992 and have
25 seen some obviously since then. The dredging of large pools

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1 in systems, the placing of gravels wanting to limit flows,
2 dredging of wetlands and filling of wetlands, placing of
3 spoils on channel base, all of these were features that were
4 moving that system in the opposite direction.
5 Q Let me talk about the large pools first. That refers
6 to three large pools dug in Lee Vining Creek in 1991; is that
7 correct?
8 A That's true. That's where most of the bigger ones
9 were.
10 Q What did you understand from a fisheries standpoint the
11 purpose of those pools to be?
12 A As rearing habitat.
13 Q Rearing habitat?
14 A Yes.
15 Q And do you know how they have done as rearing habitat?
16 A I haven't seen the fisheries data.
17 Q So you don't know whether they were successful for that
18 purpose or not?
19 A No, I don't know the numbers.
20 Q Spawning gravel has also been placed in Lee Vining
21 Creek.
22 A That is true.
23 Q Do you know whether the spawning gravel placed by the
24 consultants was in fact utilized?
25 A I may have heard stories that it was, but I am not sure

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1 that they have been used.
2 Q Do you have any data on that?
3 A No, I don't.
4 Q And it is also true that the so-called bar pool
5 thalwegs were placed in Lee Vining Creek in 1992; correct?
6 A That is, I believe, correct, yes.
7 Q Would you tell the Board what a bar pool thalweg is?
8 A That is an attempt to deepen a pool along a system and
9 create a bar in the downstream side.
10 Q The purpose, from a fisheries standpoint, is what, sir?
11 A Is to create deeper water.
12 Q How successful were the bar pool thalwegs dug in 1992
13 in achieving their stated purpose?
14 A For fish?
15 Q For fish.
16 A I don't know.
17 Q Well, you say on page 39 that "none of the other
18 treatments have significantly improved fish habitat." Now,
19 again, do you have any basis for that?
20 A I am looking at the functional habitat feature of those
21 streams and what is required generally for a system to work,
22 and just by creating a pool, I mean we have done lots of those
23 in the Northwest, and we know they don't work for fish up
24 there, and I suspect similar things are true for these
25 streams.

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1 Q In fact, you go on to say, on page 32, that "a lot of
2 this work is counterproductive." Do you remember that?

3 A Yes, it is.

4 Q Placing of gravel is included in that; is that right?

5 A Well, the placing of gravels was oftentimes in the
6 context of, if we place the gravels, then the flows should be
7 controlled. The controlling of flows because of the
8 artificial placing of gravels doesn't push that whole system
9 back towards any type of improvement. In fact, you are
10 focusing on a single reach and ignoring the rest of the system
11 entirely.

12 Q But didn't you say, at page 32, that "Lee Vining Creek
13 would provide sufficient gravels"?

14 A Yes.

15 Q Without placement?

16 A Yes.

17 Q Over what time period?

18 A It is already happening, and it will continue to
19 happen. There are plenty of gravels in those banks. There is
20 plenty of gravels in those beds. It is just a matter of time
21 for them to hydraulically sort out as vegetation begins to
22 operate in the channel.

23 Q How many spawning gravels do the fish need in Lee
24 Vining Creek?

25 A I suspect it is not very limiting because I understand

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1 the young-of-the-year, those numbers are quite high.

2 Q You have also been critical of heavy equipment, sir,
3 the effect of heavy equipment.

4 A Yes.

5 Q Do you recall that in the middle of 1992 you went out
6 in Lee Vining Creek and saw some of the bar pool thalwegs work
7 that Mr. Larsen had done?

8 A Yes.

9 Q That was on Lee Vining Creek, correct?

10 A That was on Lee Vining.

11 Q When you first saw that work, you thought it was the
12 stream naturally; correct?

13 A I don't think I said it was natural. I said it appears
14 like it is replicating some of these that a natural stream
15 would do.

16 Q Well, the first time you saw it you didn't even realize
17 somebody had worked there; isn't that true?

18 A Not initially.

19 Q You didn't realize it initially, and were later told
20 Mr. Larsen had been out there?

21 A I was drug over this pool, and I was given this
22 wonderful explanation of all the wonderful things happening
23 there, and I wasn't really asking the question, is this
24 natural or not. I was just observing at that particular point
25 in time.

00083

1 Q Your first tour was with the Department of Water and
2 Power representatives; correct?
3 A My first tour was with Bill Platts and Brian Tillemans.
4 Q And you subsequently had a tour with the Department of
5 Water and Power?
6 A Yes.
7 Q And, at that time, in May of 1992, you walked right by
8 some of Mr. Larsen's bar pool thalwegs?
9 A I may well have because that was a tour that we really
10 didn't get a chance to look at all the creek.
11 Q It wasn't until a subsequent tour that Mr. Larsen
12 attended that you realized he had been doing that work; isn't
13 that right?
14 A I was informed then.
15 Q That was work Mr. Larsen did with heavy equipment;
16 wasn't it?
17 A I don't know how he did it.
18 Q Wouldn't you agree with me if someone uses heavy
19 equipment sensitively that the work can be done without
20 substantial damage to anything?
21 A I guess that's possible, but I sure wasn't seeing it
22 when I was looking at the first treatment. I was seeing some
23 pretty incredible changes occurring, and the revegetation or
24 the placement of vegetation back onsite to me looked like a
25 mitigation measure to try and cover up the damage that had

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1 been done to existing vegetation.

2 Q You are also critical of the planning team for filling
3 up wetlands; isn't that correct?

4 A Yes, I am.

5 Q Now, let's talk about Lee Vining Creek. What was the
6 net wetland effect of the work in 1992 on Lee Vining Creek?

7 A I haven't measured that.

8 Q We have established that part of the work was to
9 rewater channels; correct?

10 A That was an objective of the RTC.

11 Q And another part of the work was to create or enlarge
12 backwaters; correct?

13 A That is true.

14 Q And both of those add to wetlands; don't they?

15 A It depends on if you are digging this pool in wetlands,
16 which is oftentimes the case. If you are digging this
17 backwater pool or area of wetland, you are destroying wetland.

18 Q Would it surprise you there was a net increase in
19 wetland as a result of the 1992 work on Lee Vining Creek?

20 A I would expect a net increase in wetland occurring in
21 that system just naturally in a major way had nothing been
22 done. I have not seen any numbers on the net effect of the
23 treatments.

24 Q Could you answer my question?

25 A I think I did.

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1 Q Would it surprise you that there was a net increase in
2 wetland as a result of the 1992 work on Lee Vining Creek?

3 A Well, there were a couple of areas that were dredged
4 out and indeed filled in, and I guess we would characterize
5 those as wetlands today, and, during subsequent field tours,
6 there was discussion about redredging those again because they
7 were backwater areas, and that's what they were supposed to
8 be.

9 MR. DEL PIERO: Your time is up.

10 MR. DODGE: Could I have another ten minutes?

11 MR. DEL PIERO: Do you want to make an offer as to why?

12 MR. DODGE: Because it is a complicated subject matter,
13 and the witness is giving long answers, only some of which are
14 responsive to the question.

15 MR. DEL PIERO: I will grant you ten minutes.

16 MR. DODGE: Thank you.

17 MR. DEL PIERO: I would point out that responses to the
18 questions that are succinct is a great help.

19 MR. DODGE: Q The historical Rush Creek situation
20 below the narrows, sir, I want to focus on that. Now you told
21 us this morning that you were walking that area yesterday, and
22 you had some question as to whether the historic channels were
23 really multiple channels or whether they were irrigation
24 channels. Do you recall that testimony?

25 A Yes. I was out there for several reasons.

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1 Q Now let me ask you to take a look at Mono Lake
2 Committee and National Audubon Society Exhibit 122, which is
3 a 1992 report prepared by Dr. Stine, where he is talking about
4 section 5b of the creek, and he lays out existing channels --
5 1929 to 1940 channels and the famous Indian Ditch that is the
6 subject of a bet between me and Mr. Chapman, and let me ask
7 you, Dr. Stine on this report shows multiple historical
8 channels in dotted lines. Do you disagree with his
9 conclusions?

10 A Well, there's dotted lines and dashed lines and I'm not
11 sure which ones --

12 Q I'm interested in the ones 1929 to 1940. I described
13 those as dotted lines.

14 A Yes, I would disagree.

15 Q Which of those channels that Dr. Stine has listed as
16 historical channels would you list as ditches, irrigation
17 ditches?

18 MR. DEL PIERO: Excuse me, gentlemen, but it would be
19 nice if everybody could return to their seats, and I will give
20 everybody a couple of minutes to find those exhibits in their
21 own files. Mr. Birmingham, do you have a copy of that, sir?

22 MR. BIRMINGHAM: I don't have a copy of that, Mr. Del
23 Piero.

24 MR. DEL PIERO: Which exhibit is that?

25 MR. DODGE: Mono Lake Committee 122.

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1 MR. DEL PIERO: Mr. Canaday, do you have a copy?
2 MR. CANADAY: No, I don't think we do, Mr. Del Piero.
3 MR. SMITH: It is upstairs.
4 MR. DEL PIERO: I have all the Los Angeles ones here,
5 too.
6 MR. BIRMINGHAM: One of the engineers of the Department
7 of Water and Power has a copy.
8 MR. DEL PIERO: Why don't you proceed?
9 DR. BESCHTA: Can you tell me the date of this
10 photography?
11 MR. DODGE: 1929 and 1930.
12 DR. BESCHTA: A Well, this channel off in the true
13 right-hand side, which is looking down valley, is one I would
14 consider most likely an irrigation conveyance system. Now it
15 is possible that it is an old channel that water was put back
16 in, but I think it is really an irrigation system coming back.
17 Q Anything else?
18 A Well, as you are well aware, looking at aerial
19 photographs and looking at all these dashed lines, this is the
20 first time I have seen this. Looking at all the dashed lines
21 on here is not something you do at a table like this. I need
22 to be looking at these stereoscopically.
23 But I could pick out this one down this side, which
24 feeds on down into, at least on the 1929 photos, and I am not
25 sure these are 1929, but on the 1929 photos, it feeds into a

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1 pond, which I have got willow in the middle of that pond, so
2 there is some type of artificial thing, obviously, going on in
3 that.

4 MR. DEL PIERO: May I point out that when you say "this
5 one" or "that one", you need to refer to which side of the
6 picture you are referring to.

7 DR. BESCHTA: I'm sorry. It is not easy, and I really
8 apologize, trying to figure out --

9 MR. DEL PIERO: You don't have to apologize. Just
10 identify which one you are talking about.

11 DR. BESCHTA: I am on this page going to call it the
12 true right-hand side. Looking downstream -- when I was in New
13 Zealand, they talked about true right and, so true right is
14 always looking down. The current channel, which is drawn
15 along the right-hand side, comes all the way down and feeds
16 back into the real Rush Creek channel down here at the bottom
17 of the picture, but the right-hand side of the page.

18 MR. DODGE: Q Would you agree -- as I understand it,
19 the remaining channels shown on Exhibit 122, you would agree
20 with Dr. Stine were historical channels?

21 A No, I wouldn't, because one of the things that isn't
22 out there is that it looks like people were moving water
23 around in a big way, and so what is an historic channel? Just
24 because it's got water in it in 1940 and is being irrigated,
25 does that constitute an historical channel? I would say no,

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1 it is an old channel with water in it.

2 Q I am trying to distinguish between irrigation ditches
3 and historical channels. Indian Ditch is an irrigation ditch.
4 I am asking you whether any of the other dotted lines on this
5 Exhibit 122 were irrigation ditches.

6 A It would look to me like the channel which is on the
7 true left-hand side towards the upper right of the picture is
8 also potentially a location of an irrigation diversion. It's
9 the one that parallels the total slope, but it's below the
10 Indian Ditch. Indian Ditch is on the hillside, and it shows
11 here very clearly toward the top of the page, and immediately
12 downslope is the main channel, and then there is the dashed
13 line which continues to the right on top of the page.

14 Q Would you agree that the historical now-dry channels in
15 Rush Creek below the narrows would not be rewatered naturally
16 given the current configuration of that stretch and the
17 incisions that occurred there?

18 A Would the historical channels not be rewatered?

19 Q Right.

20 A Naturally?

21 Q Without human intervention?

22 A Well, that system underwent a very substantial change,
23 and so to try and rewater historic channels, I don't know how
24 you do that. They are gone.

25 Q They are gone?

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1 A The historic main channel has been changed.
2 Q But I am really trying to ask a very simple question,
3 and would you agree with me that without human intervention
4 the historic channels will not be rewatered?
5 A No, I wouldn't agree with that. They will not all be
6 rewatered, but some of them indeed will be picking up water
7 and indeed some of them today are picking up water.
8 Q You talked about riparian vegetation creating pools.
9 Do you remember that testimony?
10 A Yes.
11 Q How long does that take?
12 A There is not a simple answer to that. Again, that is
13 dependent upon the rate at which vegetation grows, it depends
14 on the channel substrate that you are working with, and it
15 depends upon flow regimes that you are facing in the system,
16 in addition to the gradient of the channel.
17 Q It can take many, many decades; isn't that true?
18 A In some streams it can take decades, in other channels,
19 it can take a few years.
20 Q Now, would you agree that riparian vegetation is not
21 coming back uniformly on Lee Vining Creek?
22 A That is true.
23 Q And that there are areas where the soils were stripped
24 by the floods in the 60's and the riparian vegetation is not
25 coming back -- would you agree with that?

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1 A No, it's coming back. It is not coming back as fast.

2 Q Could we show the video one more time and show it at
3 about point 300?

4 VIDEO TAPE: It allows comparison of the vegetation
5 regrowth more clearly.

6 MR. DODGE: Q Dr. Beschta, would you agree this area
7 right here is an example of a situation where the soils have
8 been stripped away and the riparian vegetation is coming back
9 very slowly?

10 A Well, it is certainly not as prolific as near the
11 stream, so it is coming more slowly, but as far as the soils
12 being stripped away, I mean you can certainly support
13 vegetation there. You may have lost some fines on top.

14 Q Would you agree with me that that is representative of
15 a number of places on Lee Vining Creek where the riparian
16 vegetation is not coming back as quickly as in other areas?

17 A Well, it is coming back in that system. When I walk
18 along that channel, it is certainly there.

19 Q My question tried to relate to the rate of speed
20 compared to other sections of Lee Vining Creek.

21 A You are saying some places are slower than others?

22 Q Yes.

23 A Yes, that's the case.

24 Q And this is an example of one such place; correct?

25 A Well, when you see riparian vegetation recovering, you

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1 don't expect the entire bottom to go green immediately. I
2 mean this is a process. This is an ecosystem that takes time
3 and needs establishing. When you look along the channel, it's
4 obviously becoming heavily vegetated, and, as the water table
5 shifts around, you may see vegetation back there, but it could
6 take a long time.

7 Q Would you agree that planting of riparian vegetation
8 could accelerate the reestablishment at places like what we
9 are looking at at number 300 on the video?

10 A In comparison to total number of plants, yes, you can
11 go to a specific site and put plants in the ground, but in
12 comparison to total numbers of plants in the system, it really
13 doesn't add much.

14 Q Dr. Beschta, I am going to conclude with an area where
15 I think you and I are going to agree. I put it at the end
16 because I knew there would be very few. You agree that the
17 high flow event of 1938 did not significantly alter the stream
18 channel; correct?

19 A Did not significantly alter it from a platform view.
20 I'm sure there were changes alongside the bank.

21 Q Would you agree with me that in a few years, when the
22 riparian vegetation gets reestablished, that the channel and

23 banks will be highly stable?

24 A Which stream are you talking about?

25 Q Either one.

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1 A When I get all this vegetation back, I will have a
2 dynamic stream. I will have changing channels in that system.
3 I will be seeing cuttings and fillings, undercut banks, and so
4 stability is a term I am having a hangup on.

5 Q Once the riparian vegetation gets back, you are not
6 going to see substantial bank erosion; isn't that right?

7 A You will see localized bank erosion, but by and large
8 the system will be intact, yes.

9 Q And you won't see substantial channel movement; will
10 you?

11 A Oh, you could see radical channel changes. That's the
12 way these systems evolve, and when you walk across the Rush
13 Creek bottom, that's the story.

14 Q But wouldn't you agree once the riparian vegetation
15 gets reestablished, you see no need to limit flows in either
16 Rush Creek or Lee Vining Creek?

17 A I would say yes.

18 MR. DODGE: Thank you. No further questions.

19 MR. DEL PIERO: Thank you very much, Mr. Dodge. Mr.
20 Roos-Collins. Are you ready to go, sir?

21 MR. ROOS-COLLINS: Yes, I am.

22 CROSS-EXAMINATION,

23 BY MR. ROOS-COLLINS:

24 Q Good afternoon, Dr. Beschta.

25 DR. BESCHTA: A Good afternoon.

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1 Q The last time I saw you we were before Judge Finney in
2 El Dorado Superior Court. Do you recall that hearing?

3 A Yes, I do.

4 Q I would like to take a different approach to this
5 cross-examination. Cal Trout stipulates for the purpose of
6 this cross-examination, that the reintroduction of flows and
7 the removal of grazing has resulted, in some instances and in
8 some locations, in an increase in the groundwater table, an
9 increase in riparian vegetation, change in channel form,
10 including deepening of pools, narrowing of the channel, and
11 movement of gravel. We stipulate to all of that. So, for the
12 purpose of this cross-examination, none of my questions go to
13 whether reintroduction of flow and removal of grazing have had
14 an effect. Instead, all my questions go to the pace and
15 extent of change in Rush and Lee Vining Creeks as that change
16 relates to the conditions that existed before Los Angeles
17 began diversion in 1941. Are you with me?

18 A I think I follow you.

19 Q Let me also say Cal Trout has great respect for you as
20 a scientist. With those two deductions --

21 A Can we stop there?

22 (laughter)

23 Q With those introductions, let's discuss your testimony.
24 Your testimony indicates that you conducted a field review of
25 the tributaries to Mono Lake; is that correct?

00095

1 A That is true.

2 Q You also have reviewed written testimony by other
3 witnesses in this proceeding; is that correct?

4 A That's right as to some testimony. I'm sure I've not
5 seen all of it.

6 Q Have you personally undertaken any measurements of
7 vegetation growth along these tributaries?

8 A I have personally measured plants when I have been out
9 there, but I have not done a systematic survey of the plants.

10 Q Channel form?

11 A Again, I have made measurements, but not a systematic
12 survey.

13 Q Fish populations?

14 A No.

15 Q Have you ever designed a stream restoration program for
16 purposes of bringing back a fishery?

17 A I have been involved in projects where that's the case.

18 Q Have you ever designed a stream restoration program for
19 the purpose of bringing back a fishery, had primary
20 responsibility for the design of such a program?

21 A It depends upon your goal, I guess. I am involved
22 right now in a proposal to restore a stream in Alaska, and,
23 you know, I could turn around and say, "This is really for
24 fish," but it is for the broader ecosystem functions, which we
25 think will help the fish, but we didn't start out saying "fish

00096

1 are our objective, this is where we want to go."

2 Q Let's turn then to the substance of your written
3 testimony. Your testimony states that all or nearly all of
4 the flow was diverted at certain times from the tributaries to
5 Mono Lake. What is the basis for that representation?

6 A Could you tell me where that is? I am not sure of the
7 context.

8 Q Page 21.

9 A All right. Based on work by Dr. Bill Platts and Dr.
10 Chapman, I put together and presented to the Board here last
11 week or two weeks ago.

12 Q Other than Dr. Chapman's and Dr. Platts' testimony, do
13 you have any basis for that statement?

14 A I have seen flow records for the gage up near the
15 highway which indicates that water was absent from those
16 channels.

17 Q You are referring to the records contained in their
18 testimony?

19 A I don't know if it is exactly in their testimony, but
20 I have seen flow records at various points, and I am not sure
21 it is contained there.

22 Q Do you have any data that show that Rush Creek was ever
23 dry below Highway 395 from 1920 through 1941?

24 A It may be one of the sets of photographs show that Rush
25 Creek below the narrows may have once been dried up, but I

00097

1 don't have any hard evidence.

2 Q Do you have any data that shows that Rush Creek was
3 ever dry from Grant Dam down to the return of the Mono Ditch?

4 A No, I don't.

5 Q Do you have any data that showed that Lee Vining Creek
6 was every dry?

7 A I don't have any data, but I think it is inferred in
8 the testimony of various individuals that that creek went dry.

9 Q You have no data?

10 A I have no data.

11 Q Your testimony also states that the tributaries to Mono
12 Lake underwent extremely rapid change in flow. The statement
13 appears on page 24 of your testimony on the very final line.
14 What is the basis for that statement?

15 A Again, this is part of -- I believe it would go back to
16 Dr. John Chapman and Dr. Bill Platts, where they find that the
17 irrigation diversions were creating rapid fluctuations. As
18 you take it out of the stream and put it in a ditch, obviously
19 there is a major change, and as you change that around and
20 take water out of the ditch and it goes back in the channel,
21 there's a very rapid fluctuation.

22 Q Were you here for Dr. Chapman's testimony before the State
23 Board last week?

24 A Yes, I was.

25 Q Do you recall he examined a table from LADWP, Comments

00098

1 on the Draft EIR, that showed five changes in the decade of
2 the 1930's in excess of 100 cfs in Rush Creek?

3 A I remember hearing that, but I didn't have the table in
4 front of me, but I remember some testimony relating to that,
5 yes.

6 Q Other than Dr. Chapman's and Dr. Platts' testimony, do
7 you have any basis for the statement that tributaries to Mono
8 Lake underwent extremely rapid changes prior to 1941, rapid
9 changes in flows, excuse me?

10 A I guess most of the basis of my testimony would be
11 that, although again I believe there's other testimony, there
12 is information, and I can't point to an individual, but the
13 basis I believe would be Chapman and Platts.

14 Q And you are familiar with Chapman's and Platts'
15 evaluation?

16 A About the highway?

17 Q Yes.

18 A I am familiar with that testimony, at least I heard
19 that testimony.

20 Q In the period 1935 to 1941, who owned the water rights
21 upstream of the evaluation reach in Rush Creek?

22 A I don't know.

23 Q In the decade of 1930 to 1941, who owned the water
24 rights for diversion from Lee Vining Creek?

25 A I don't know.

00099

1 Q Let's turn now to grazing in the Mono Basin prior to
2 1941. On page 25, your testimony stated that grazing and flow
3 alterations "generally precluded" the establishment of
4 riparian species and of high flows. Does the term "generally
5 precluded" mean in most places at most times?

6 A That would be the sense of what it is saying, yes.

7 Q What is the basis for that statement?

8 A Well, there's a lot of experience built in here, that
9 is, in the last several years, I have had an opportunity in
10 Oregon to review projects that have taken place in Western
11 Oregon, Eastern Oregon, and into Idaho, and went in five, ten
12 years after channel manipulation and habitat changes had taken
13 place in all those systems. It is pretty apparent that as
14 long as you sustain grazing and heavy grazing on a degraded
15 system, that it is very difficult for regeneration of young
16 plant species, particularly willows, particularly the
17 cottonwoods, for them to occur.

18 And also I have been involved in some research projects
19 where we are looking at that very same aspect.

20 Q Other than your experience elsewhere and your knowledge
21 as a scientist, do you have any basis for the statement that
22 the establishment of cottonwoods and willows was generally
23 precluded along these tributaries prior to 1941?

24 A Well, the grazing pressure would be an important aspect
25 of that, and one of the things that I saw when I was in the

00100

1 field, there's some places where probably sheep didn't get
2 into in the bottomlands, and so there probably were some
3 places where cottonwoods were coming up prior to that.

4 Q Do you recall a statement in Dr. Chapman's and Dr.
5 Platts' testimony that it is impossible to determine the
6 condition of understory vegetation from examination of aerial
7 photos?

8 A I don't recall it exactly, but it becomes very
9 difficult, yes.

10 Q Are you aware of any ground photos taken prior to 1941
11 that demonstrate that the establishment of cottonwood and
12 willow vegetation was generally precluded by grazing?

13 A There were some photos that were presented during Dr.
14 Platts' and Dr. Chapman's testimony that illustrated those
15 effects.

16 Q And weren't those photos taken after 1941?

17 A I believe they were.

18 Q During the decade 1930 to 1941, who owned the land
19 where the grazing occurred adjacent to Rush Creek?

20 A Apparently the Department of Water and Power.

21 MR. DEL PIERO: Doctor, if you don't know the answer
22 and your colleague doesn't, it is more than adequate to say
23 you don't know.

24 MR. ROOS-COLLINS: Q Let's turn now to the
25 conditions that existed in Mono Basin between 1941 and 1983.

00101

1 First, do you know how much the average annual diversion by
2 Los Angeles DWP was during that period?

3 A I have seen a number, and the number that sticks in my
4 mind is 60,000 acre-feet or perhaps more.

5 Q Do you know how that diversion during that period
6 compared to the diversion by irrigators from 1930 through
7 1941?

8 A Well, I believe there's some testimony that, what was
9 it, 30,000 acre-feet was being spread on 2,100 acres, as a
10 number, 14 acre-feet per acre. That's the only number that I
11 could give you right now, and that's based on some testimony,
12 written testimony.

13 Q Let's discuss grazing then -- on page 28 of your
14 testimony, which states that grazing and diversions "regularly
15 hampered" the establishment of riparian vegetation.

16 A Yes.

17 Q Now the term "generally precluded" sounds worse to me
18 than "greatly hampered"; is that your intent?

19 A Not really.

20 Q Would you agree with me that riparian vegetation along
21 the tributaries to Mono Lake declined substantially between
22 1941 and 1983?

23 A Oh, yes.

24 Q Do you agree with the Draft EIR's estimate that the
25 amount of mature cottonwood and willow declined in excess of

00102

1 90 percent during that period?

2 A It's entirely possible.

3 Q You testified, in answer to Ms. Cahill's question, that
4 you have never seen a quantification or a mapping, I'm not
5 sure which, of the riparian vegetation along these tributaries
6 before 1941 and after 1941 so you could compare the two
7 periods. Was that your testimony?

8 A I may have said that, but I would be incorrect, because
9 in the Draft EIR there are numbers and there are maps.

10 Q Do you dispute the numbers and maps contained in the
11 Draft EIR showing changes in vegetation along the tributaries
12 to Mono Lake?

13 A No, I think there were rather substantial changes.

14 Q On page 28 of your written testimony, you state:
15 "Lowering of Mono Lake in the 1920's to the 1960's provided an
16 opportunity for incision of Rush Creek." Do you recall that
17 testimony?

18 A Yes.

19 Q What was the decline in Mono Lake between 1920 and 1941
20 in vertical feet?

21 A I don't have the figure here, but it was not, as I
22 remember, very substantial in comparison to what's happened
23 post 1945.

24 Q Are you familiar with Figure 1-7 in the Draft EIR,
25 which shows the Lake level between 1912 and 1992?

00103

1 A I don't have that with me.
2 Q I will show it to you.
3 A Okay.
4 Q Does Figure 1-7 show that Mono Lake dropped
5 approximately 14 feet between 1919 and 1941?
6 A That looks reasonable.
7 Q Are you familiar with Mr. Vorster's estimate that only
8 one to two feet of that drop occurred as a result of
9 irrigation diversions?
10 A I don't know that.
11 Q You would agree that the drop in elevation between 1941
12 and 1983 is substantially greater than the drop between 1919
13 and 1941; wouldn't you?
14 A It is very dramatic.
15 Q Would you agree with me that most of the incision that
16 occurred in Rush Creek occurred after 1941?
17 A Oh, yes.
18 Q Finally, let's discuss the changes in channel form that
19 occurred between 1941 and 1983. Are you familiar with Dr.
20 Stine's report, "Past and Present Geomorphic, Hydrologic, and
21 Vegetation Conditions on Rush Creek," which is both Mono Lake
22 Committee and Cal Trout Exhibit 13 in this proceeding?
23 A Can I look at it and see?
24 (After looking)
25 No, this is the same one Mr. Dodge was showing me. I

00104

1 haven't seen that.

2 Q Are you familiar with Trihey and Associates' estimates
3 of loss in channel length between 1941 and 1983 in Rush Creek?

4 A They have some very large numbers as far as channel
5 losses.

6 Q And do you dispute those numbers?

7 A Well, it goes back to the interpretation of what
8 constitutes a channel.

9 Q Okay. You previously discussed that matter with Mr.
10 Dodge, and I will not pursue it further. Let's turn to the
11 subject of the impact of the restoration activities undertaken
12 by the Restoration Technical Committee. You have criticized
13 the RTC's understanding of ecological processes. You are
14 aware that your client, LADWP, is a member of that Committee?

15 A I know they are, yes.

16 Q Let's begin with the grazing moratorium that began in
17 1991. Did LADWP voluntarily agree to exclude sheep from the
18 Mono Basin?

19 MR. TILLEMANS: A Yes, we did.

20 Q Mr. Tillemans, are you familiar with a March 26, 1991,
21 letter from Jim Edmonston, President of Cal Trout, to Trihey,
22 the restoration consultant for counseling that a grazing
23 moratorium be established?

24 A I can't recall that exactly.

25 Q Do you recall RTC met in April of 1991 to discuss

00105

1 whether such a moratorium should be established?

2 A I recall a series of meetings in which that was
3 discussed, yes.

4 Q Do you recall that a vote was taken in April of 1991
5 when Los Angeles specifically opposed the establishment of
6 such a grazing moratorium?

7 A It wasn't in opposition to the grazing moratorium, and-
8 I need to explain what is going on at that time.

9 Q Please do briefly.

10 A At the time there was a push not to just exclude grazing
11 moratorium on the floodplain, there was also a push to
12 bringing consultants in and developing grazing plans and
13 what have you.

14 The Department has a range wildlife staff. We have a
15 botanist on board. We have a consultant, Dr. Platts, who has
16 riparian livestock expertise, and at that time, we felt it was
17 in the Department's best interest to oppose efforts to take
18 control of our leases in Mono Basin, because we felt we had
19 the expertise and staff to handle that, so although it may
20 have come across that we were opposing a grazing moratorium,
21 we wanted to maintain the objective of maintaining our staff
22 and Dr. Platts in dealing with those situations up there.

23 MR. ROOS-COLLINS: Thank you, and I will add, by way of
24 comment, that Cal Trout is grateful that the moratorium is.
25 still in effect with L.A.'s support. Has my time expired?

00106

1 MR. DEL PIERO: Yes.

2 MR. ROOS-COLLINS: I request additional time on the
3 ground that Mr. Dodge got 50.

4 MR. DEL PIERO: Mr. Dodge did get 50, but he gave a
5 better reason than that.

6 MR. ROOS-COLLINS: He gave the reason we have all
7 given, which is the complexity of the issues and the
8 importance of this testimony.

9 MR. DEL PIERO: I recognize the significance of these
10 two particular witnesses in regard to this. How much time do
11 you want?

12 MR. ROOS-COLLINS: An additional 20 minutes, please.

13 MR. DEL PIERO: Granted. I am going to take this
14 opportunity to point out something I decided over the weekend,
15 which I am sure you will not be pleased about. I have asked
16 Maureen Marche' to schedule additional days for this hearing.
17 In fact, every available day in the month of December is going
18 to be scheduled, up until I believe the 21st or 22nd of
19 December. Additionally, it's very likely we're going to go
20 into night sessions on this hearing in order to get this
21 matter before the Board before the Christmas holidays. Mr.
22 Stubchaer points out you don't have to agree. You just have
23 to show up. Please proceed. (laughter)

24 MR. ROOS-COLLINS: I'm sure Mr. Canady hopes you will
25 not have to hang up Christmas stockings.

00107

1 MR. DEL PIERO: That will be an assurance.

2 MR. ROOS-COLLINS: Dr. Beschta, let's discuss the
3 impact of the restoration program on wetlands. You state, on
4 page 33, "The dredging and filling of wetlands resulted in
5 unacceptable impact to those systems."

6 I will show you now a letter, dated August 31, 1992,
7 from Ted Winfield of ENTRIX to Liz Varnhagen of the Army Corps
8 of Engineers, which I will offer as Cal Trout Exhibit 16.
9 I will distribute this letter. Please review it and tell me
10 whether you have previously seen it.

11 MR. DEL PIERO: Do you have extra copies for Mr.
12 Canady?

13 MR. ROOS-COLLINS: Yes.

14 Q Dr. Beschta, have you previously seen this letter?

15 DR. BESCHTA: A No, I haven't.

16 Q On page 4, the letter states --

17 MR. BIRMINGHAM: I am going to object on the ground of
18 hearsay.

19 MR. DEL PIERO: Mr. Roos-Collins.

20 MR. ROOS-COLLINS: I haven't even asked a question.

21 MR. DEL PIERO: I think the observation that he has not
22 asked a question is correct, Mr. Birmingham. What aspect of
23 hearsay are you alleging? I don't think it is hearsay. Why
24 don't you proceed, Mr. Roos-Collins:

25 MR. ROOS-COLLINS: Q Let me say at the outset, so

00108

1 Mr. Birmingham is comfortable. I am asking you to assume, for
2 purposes of this question, that the letter states that .024
3 acres of wetland habitat was affected by construction in the
4 pilot program on Lee Vining Creek and that .68 acres of
5 wetland developed as a result of the pilot program. I am
6 asking you to accept that as true. What I want to know,
7 though, is whether you have any basis for disputing that
8 representation.

9 A These are numbers due to the construction activity of
10 creating wetlands?

11 Q Please assume that for purposes of the question.

12 A I'm not sure I know how you construct those wetlands.
13 The construction activities that were going on up there were
14 working on the channels, and now you are pointing out they
15 were actually constructing wetlands, and yet the wetlands I
16 saw were going the other way. So I don't understand the
17 numbers.

18 Q Then let me explain the hypothetical more clearly.
19 Assume that in the course of construction, .024 acres of
20 wetland were destroyed or degraded, and assume that the
21 construction resulted in the rewatering of channels that were
22 previously dry, and that incidental to such rewatering, .68
23 acres of wetland were created. The question is: Do you have
24 any basis for disputing that representation?

25 A If you are picking up wetlands by rewatering channels,

00109

1 then it is obvious you can make more wetlands.

2 MR. ROOS-COLLINS: Thank you. Mr. Del Piero, I will
3 not move for admission of that Exhibit until the author is
4 available to authenticate it.

5 MR. DEL PIERO: Thank you.

6 MR. ROOS-COLLINS: Q Let me turn now to your
7 representation on page 33 that the pools created or excavated
8 by the restoration consultant on Rush Creek were
9 a total modification of the stream system.

10 A True.

11 Q What do you mean by the term "total modification"?

12 A were huge pools in a system in that particular
13 stream, and they were not sustainable by any flow regime that
14 I would perceive coming down through that system. So you can
15 make pools the size of this room, literally a stream, and
16 that's not sustainable. Those pools were not sustainable.
17 They will fill.

18 Q Has Mr. Trihey made pools the size of this room?

19 A No, he hasn't.

20 Q You say the pools he constructed in Rush Creek are a
21 total modification of the ecological system.

22 A They were dredging material out of the creek. They
23 were placing it on the channel banks, on the new channel
24 banks, so any vegetation there was no longer able to grow.

25 When you scour out material, the kind of banks you leave are

00110

1 not the same kind of banks that scour out with vegetation
2 attached to it, so they are sloping sides instead of vertical
3 sides or undercut sides. So I would argue, yes, it is total.

4 In addition, if you got bedload transport coming
5 downstream, these are bedload traps. They are not going to
6 continue on through.

7 Q How did those pools compare with the changes in channel
8 that occurred between 1941 and 1983, as a result of the
9 operation of the water supply system?

10 A How did those compare with the operation of Los
11 Angeles' system? I am not sure I understand.

12 Q How do those pools compare to the changes in channel
13 form that resulted from the operation of L.A.'s water supply
14 system between 1941 and 1983?

15 A Well, there was obvious scouring in the upper reaches
16 in that period due to high flows.

17 Q Are you familiar with Dr. Stine's estimate that the
18 total length of channel in the bottomland alone was halved
19 between 1941 and 1983?

20 A I've seen the numbers indicating major changes, yes.

21 Q Assume that's true, how would you compare the
22 environmental impact with halving the channel length with
23 construction of the four pools?

24 A I never said -- well, first of all, halving the channel
25 -- again, the question is what is your reference point. You

00111

1 have to start somewhere. Okay, if you are using the 1941
2 basis as defined, okay, then you have got, I think, an
3 inflated number, so I don't think the channel length has been
4 halved. That channel system, all photographs show a
5 mainstream channel with local braiding over the years has
6 taken place. It's happening out there today.

7 Q Dr. Beschta, are you familiar with the Cal Trout 2
8 case?

9 A No, I am not familiar by that name.

10 Q Are you familiar with the Court of Appeals Decision,
11 which is the law governing this proceeding?

12 A You have to tell me something more specific. I would
13 not say.

14 Q Let me move on then. You testified on page 34 that
15 physical-mechanical intervention is "generally unsuccessful".
16 Are you familiar with the 1991 agreement between the parties
17 in the Mono Lake cases entered into by Los Angeles and the
18 other parties to those cases?

19 A I don't believe so. You mean a written document?

20 Q Yes.

21 A No, I am not.

22 Q Let me read a statement and ask you to state your
23 opinion of it: "The restoration programs will emphasize
24 taking actions to initiate, accelerate, and facilitate the
25 natural recovery of the aquatic and riparian resource values

00112

1 and habitats in Rush and Lee Vining Creeks. This does not
2 preclude an engineering/construction approach where
3 appropriate."

4 Do you agree or disagree?

5 A Well, the first part is a noble goal, and I think that
6 certainly would be an appropriate goal, but the construction
7 techniques that I was seeing implemented and utilized in those
8 systems were not providing, in my view, a benefit to the
9 system, and I wasn't focusing specifically on fish as the only
10 criteria. I was looking at fish require other organisms for
11 food sources, they require cover, they require temperature
12 modification.

13 I was attempting to take the more holistic view of what
14 those streams can and should do, and that's the set of glasses
15 I was wearing.

16 Q Since you testified you weren't familiar with the
17 written document which I call "The 1990 Agreement," again let
18 me ask you to assume that agreement describes conditions which
19 maintained and benefited the fisheries in Rush and Lee Vining
20 Creeks before L.A. began diversions. Let me ask you to
21 further assume those conditions include streamflows, benthic
22 organisms, riparian vegetation, channel configuration,
23 nutrients of springs, and water temperatures. On the basis of
24 that assumption, do you have an opinion how long it will take
25 to reestablish the conditions that benefited the fisheries

00113

1 before L.A. began diversions in 1941?

2 A It is already happening.

3 Q Are we there yet?

4 A You are never going to be there yet. These systems
5 don't have any discrete end point.

6 You can go out there, and any little piece of gravel
7 bar out there, and find essentially no vegetation, very dense
8 vegetation, and you will find young age classes and modern age
9 classes and older age classes. There's an incredible amount
10 of diversity out there, so defining the end point is really
11 defining the diversity of that system. That diversity is now
12 underway. It's developing.

13 Q Again, as I said at the outset in my stipulation, I
14 agree with you. The only issue I am attempting to explore in
15 cross-examination is whether we have attained the conditions
16 which existed before 1941. Let me ask you specifically about
17 vegetation. Assume that the Draft EIR is correct and that
18 between 1941 and 1989 we lost 90 percent plus of mature
19 willows and cottonwoods adjacent to tributaries to Mono Lake.
20 How long will it take us to get the mature willows and
21 cottonwoods back to the extent that existed before 1941?

22 MR. BIRMINGHAM: I am going to object on the ground the
23 question is ambiguous. Mr. Roos-Collins is asking this
24 witness a question about what is stated in the 1990 agreement.
25 In fact, the 1990 agreement --

00114

1 MR. DEL PIERO: Actually, that is not the nature of the
2 question unless I am missing something.

3 MR. ROOS-COLLINS: That is not my question.

4 MR. DEL PIERO: That is not the nature of the question.
5 Do you have other grounds for objecting?

6 MR. BIRMINGHAM: I believe if we can go back to the
7 beginning of the question, the record will show that it was
8 initiated with a reference to the assumptions that are made
9 concerning conditions that benefited the fishery as stated in
10 the 1990 agreement.

11 MR. DEL PIERO: Actually, that was two questions before
12 the one you asked, Mr. Roos-Collins. Perhaps you thought it
13 was connected. I did not.

14 Ms. Book, will you read Mr. Roos-Collins' last question
15 back?

16 (The question was read back as follows:)

17 Q Again, I said at the outset of my stipulation,
18 I agree with you. The only issue I am attempting
19 to explore in cross-examination is whether we have
20 attained the conditions which existed before 1941.
21 Let me ask you specifically about vegetation.
22 Assume that the Draft EIR is correct and that
23 between 1941 and 1989 we lost 90 percent plus of
24 mature willows and cottonwoods adjacent to
25 tributaries to Mono Lake. How long will it take

00115

1 us to get the mature willows and cottonwoods back
2 to the extent that existed before 1941?

3 MR. DEL PIERO: Dr. Beschta, do you understand the
4 question he asked you. He asked you to assume what the
5 representations were in the Draft EIR.

6 DR. BESCHTA: A Were the basis.

7 MR. DEL PIERO: And on that basis then, he asked you
8 how long it would take the biomass of the cottonwood and
9 willow riparian vegetation to be restored. Would you go ahead
10 and answer that question?

11 A It is not a very easy one to answer, and I am not
12 trying to go around the point here. We have got road systems
13 affecting this stream channel today that we didn't have back
14 then. We had grazing going on, we had all kinds of things.
15 I am not trying to bring those back into the picture. I
16 realize that, and we've had these major channel changes take
17 place. As long as it takes me to grow large trees, I can do
18 it. We can grow those in a very short period. We have leader
19 growth out there two feet a year. We've got some old
20 cottonwoods, which I thought originally would likely be dead,
21 but are regrowing, and these are 15 and 18-inch-diameter
22 trees, but they are only 12 feet tall, the tops are broken
23 off. These are mature cottonwoods, and now they are regrowing
24 from midway up. Cottonwoods are coming in. It may take 20 or
25 30 years to get what you might consider mature cottonwoods.

00116

1 MR. ROOS-COLLINS: Q Let's talk then about channel.
2 In Cal Trout Exhibit 9, which is entitled, "Comparison of
3 Historic and Existing Conditions on Lower Lee Vining Creek,"
4 published by Trihey and Associates in January of 1992, Dr.
5 Stine estimates that there was a 55 percent decrease in the
6 occurrence of short meander bends in Lower Lee Vining Creek
7 between 1941 and the present.

8 He further states that if you include subsidiary
9 channels the total decrease in the meanders on subsidiaries is
10 in excess of 80 percent.

11 Now assume that sinuosity is a condition that benefits
12 the fisheries, assume that we have no restoration other than
13 continuing watering of the channel, how long would it take for
14 Lee Vining Creek to reestablish the sinuosity that existed
15 before 1941?

16 A It depends upon the flow regime, which is a major
17 factor. Vegetation is part of it. The flow regime is another
18 part. The reestablishment of those systems does indeed take
19 time, and I don't have a good answer for that. I mean it is
20 a system that is recovering back again after a severe
21 disturbance. It's had fire, it's had dewatering, it's had
22 grazing, and it's kind of like magically when will we put it
23 back together again. Well, we are talking about succession in
24 ways in a system that have never experienced what we are
25 trying to do today, so you are asking me to predict the future

00117

1 in a tight context, and I can't do that, I guess.

2 Q Dr. Beschta, it is a very difficult question, not
3 because I put it that way, but because the reality is complex,
4 and I think all parties agree with that. Nevertheless, this
5 Board has a responsibility to comply with the mandate of the
6 Court of Appeals, and I am asking, assuming that water is put
7 back in the channel and no further intervention occurs, do you
8 have any opinion how long it would take Lee Vining Creek to
9 establish the same velocity which existed before 1941?

10 A If you took out this 1941 view of the world, which I am
11 going to argue is a disturbed view in the sense that those
12 channels were already changed, that you will see sinuosity
13 coming back, and it's starting to come back today, and within
14 10 years, that vegetation -- this vegetation is just at its
15 beginning. I mean it's five to eight feet off the ground.
16 Three years ago it wasn't a foot high.

17 The root mass underneath there is incredible. We are
18 just starting to see the effects of that, and it is going to
19 happen, and it is coming very quickly, so I am going to say
20 within the next decade or so you will see significant
21 development of pools in that system.

22 Q That wasn't my question. My question is: How long
23 would it take to reestablish the sinuosity which existed
24 before 1941, absent intervention?

25 A I cannot recreate 1941 streams because of all the

00118

1 historic disturbance patterns, including diversions.

2 Q Let's turn finally to the recommendations you have for
3 this Board. First, are you familiar with the LADWP Management
4 Plan submitted to this Board, which includes a flow
5 recommendation?

6 A I have heard about it, but I have not read a specific
7 management plan.

8 Q Do you have a flow recommendation for the Board in
9 these proceedings?

10 A No, what I have are criteria that I put forward
11 regarding what those flows in general should look like, so
12 criteria should be addressed when people begin to think about
13 setting a flow regime.

14 For example, I have heard about setting constant flow
15 regimes. Constant flow is not what this system is about.

16 Q Do you have a flow recommendation for the Upper Owens
17 River?

18 A I have not done any work in the Upper Owens.

19 Q Do you have a recommendation about grazing on lands
20 adjacent to the tributaries to Mono Lake? I believe your
21 testimony contains such a recommendation.

22 A The long-term or the short-term?

23 Q Over the long-term.

24 A Continued removal of grazing at least for a period of
25 time until reestablishment of vegetation occurs, and I think

00119

1 it is conceivable that with some form of control grazing could
2 be reinstated in that system without having adverse effects.
3 It is down the road, it is a long way down.

4 Q Do you have a recommendation for grazing management in
5 the Upper Owens Basin?

6 A I do not.

7 Q Do you have a recommendation regarding the continued
8 operation of the gravel mines in the Rush Creek Basin?

9 A If these gravels are ending up in the stream, I would
10 definitely attempt to prevent that.

11 Q Do you have a recommendation regarding traffic
12 management, movement of cars and people along these streams?

13 A Along the streams, well, roads are certainly a concern.
14 You have already got several crossings. You have got these
15 fords, you have got the county roads, and if you keep adding
16 roads to that system, you're going to change that as much as
17 anything else you're doing.

18 MR. ROOS-COLLINS: Thank you. No further questions.

19 MR. DEL PIERO: Thank you very much, Mr. Roos-Collins.
20 We are going to take a break for 10 minutes and then we will
21 be back.

22 (Recess.)

23 MR. DEL PIERO: Ladies and gentlemen, this hearing will
24 again come to order. Mr. Haselton, where are you?

25 I have been advised by the representative of the State

00120

1 Lands Commission that they have no objection to your going
2 before them, inasmuch as you have a plane to catch. Is that
3 true?

4 MR. HASELTON: Absolutely true.

5 MR. DEL PIERO: This is your lucky day, sir.

6 MR. HASELTON: I don't know if it is indicative of my
7 lucky day, but I will take what I can get.

8 CROSS-EXAMINATION,

9 BY MR. HASELTON:

10 Q Dr. Beschta, I am Frank Haselton. I am working with
11 John Arcularius and some of the other folks in the Upper Owens
12 Valley. I have just a couple of questions, one regarding
13 ramping, which I think was included in your recommendations,
14 and at the bottom of page 24 of your testimony, if you went to
15 go ahead and turn there, I think made reference that rapid
16 changes in flow were common, and my first question is: Were
17 those both positive and negative changes, both increase and
18 decrease in flows?

19 DR. BESCHTA: A Well, a rapid change, if you are
20 shunting water for irrigation, and you're putting it into a
21 ditch, and you are stopping flows in the channel, I would not
22 consider that as a positive feature. Similarly, if all of a
23 sudden I begin to release water back into the channel and
24 close off an irrigation ditch, I wouldn't consider that
25 positive either.

00121

1 Q Let me -- I used positive and negative in the sense of
2 increase and decrease. My question is, that statement, rapid
3 changes in flow were common, did that mean the changes
4 involved both a negative, a decrease in the water, and also an
5 increase in the water in that channel?

6 A Yes, it would follow both directions.

7 Q Would these rapid changes in any one day exceed perhaps
8 10 percent of what the flow might have been in those channels
9 in any one day?

10 A I believe they would have, yes.

11 Q The reason for these rapid changes was basically for
12 irrigation purposes?

13 A Yes.

14 Q Would another reason for the change be the immediate
15 availability of water in the watershed and the need to convey
16 it?

17 A Which period are you talking about?

18 Q Well, I guess I am talking about pre-1940. I share
19 with you the difficulty of distinguishing between natural,
20 1940 -- I have a hard time. So let's just deal in the context
21 of your testimony there.

22 A And your question is with regard to moving water
23 around?

24 Q Well, the reason for the rapid changes. One reason is
25 for irrigation. Would not another reason be because it is an

00122

1 Eastern Sierra snowmelt stream, and there's a fairly
2 significant amount of water in a short period of time, and
3 there is a need to release it?

4 A From a facility?

5 Q Let's say old Grant Lake. I don't know if that's the
6 proper term for it.

7 A I don't know what the operational status of Grant Lake
8 was prior to 1940, whether they had that kind of control.

9 Q Well, let me ask this then: This is again back to the
10 fact this is an eastern snowmelt high Sierra stream, and let's
11 just talk of the natural context. Is not one of the
12 characteristics of this type of stream rapid fluctuations in
13 flows primarily due to snowmelt and gradient and other issues
14 like that?

15 A Yes, if you look at a hydrograph during the summer
16 runoff period, you see indeed rapid fluctuations on a daily
17 scale, weekly scale, and also on a 24-hour basis you see
18 changes occurring.

19 Q So, in your recommendation to ramp flows to gradually
20 increase and gradually decrease, this is to essentially
21 protect, if you will, the habitat from what would occur
22 otherwise naturally?

23 A Well, you would provide time for organisms in the
24 stream to respond to changing flow conditions. I mean the
25 changes that occur even in e 24-hour period, although they are

00123

1 quite significant, are coming up, they are coming down, and
2 that's quite different than if you kind of quickly change the
3 flow regime. So there's that situation. Over a seasonal
4 scale, we need to be thinking a little bit about the
5 requirements for reestablishing plants, and if we get a flow
6 up and then we shut it down, we may be establishing plants at
7 that particular time and then we lose the water so their root
8 growth cannot keep up with the declining water table, so we've
9 got a seasonal issue going on. So there are several things
10 involved.

11 MR. HASELTON: Okay, thank you.

12 MR. DEL PIERO: Thank you very much, Mr. Haselton. Ms.
13 Scoonover.

14 MS. SCOONOVER: Good afternoon. In the interest of
15 conserving everyone's time, and not coincidentally due to the
16 fact I have a nonrefundable airline ticket for the holidays,
17 I will keep my questions brief. (laughter)

18 MR. DEL PIERO: What day do you intend on leaving?

19 MS. SCOONOVER: The 19th.

20 MR. DEL PIERO: Well, inasmuch as we are setting the
21 schedule now, if you or other representatives of different
22 organizations or individuals have particular considerations
23 that you would like Board Members to think about during the
24 course of the next two days, we need to know about them in
25 advance. Thank you for taking the initiative and telling me

00124

1 that, and if the rest of you have considerations -- a month-
2 long vacation in Tahiti during the month of December will be
3 an unacceptable excuse, but we will try and make
4 accommodations if you let us know, and I would appreciate it
5 if you would pass that information on to Mr. Canady. Please
6 proceed.

7 CROSS-EXAMINATION,

8 BY MS. SCOONOVER:

9 Q I would like to start with a couple of questions for
10 you, Mr. Tillemans, on the video.

11 Dr. Stine, if you could start the video at about 1,200,
12 we are going to be looking at Rush Creek delta.

13 VIDEO TAPE: In 1987 the stream was a wide, unconfined
14 channel, and no riparian vegetation is apparent. The stream
15 remained in this condition until livestock grazing was
16 removed.

17 MS. SCOONOVER: If you could stop at the side-by-side
18 comparison.

19 VIDEO TAPE: In 1993, this stream reach is well
20 vegetated and has begun to narrow and deepen- The riparian
21 system is now interacting with the channel. This natural
22 recovery has occurred without artificial restoration. This
23 side-by-side --

24 MS. SCOONOVER: Fine, thank you.

25 Q Mr. Tillemans, I assume this shot at about the same

00125

1 location in 1987 and in 1993?

2 MR. TILLEMANS: A Yes. We went to great lengths to
3 try to make sure we duplicated that.

4 Q I believe Ms. Cahill asked you about the difference in
5 color from the 1987 to the 1993 photo, and you responded you
6 didn't know whether a blue filter was responsible for the
7 difference in the color of the 1993 picture; is that correct?

8 A That's correct.

9 Q I direct your attention to the background, and maybe
10 you can help me out. I am a little confused. It appears that
11 Paoha Island is in the background of both shots.

12 A You can see Paoha and Negit Islands on the left-hand
13 side.

14 Q And it also appears that Paoha Island in the picture on
15 the left is two to four times larger than Paoha Island in the
16 picture on the right. Is that also your understanding?

17 A I need a clearer look. It may be a little bit larger,
18 but I don't know about factorwise.

19 Q Do you know whether this 1987 shot was taken with some
20 sort of wide-angle lens?

21 A As far as the details of the lenses and video and that,
22 you would probably have to refer to the person that took the
23 shot. I just tried to duplicate the sites.

24 Q If we assume that, for example, a wide-angle lens was
25 used on the shot of 1993, wouldn't that, in effect, make the

00126

1 items within the shot of 1993 appear to be narrower than in
2 the 1987 shot, which would lead to the difference in Paoha
3 Island that you see in the background?

4 A Again, you are asking the wrong person as far as
5 cameras go.

6 Q That's fine. Thank you. I have a couple of questions
7 for you, Dr. Beschta, and I would like to refer to Figures 3
8 and 3A that you spoke about earlier, if you wouldn't mind
9 setting up the images of 3 and 3A.

10 DR. BESCHTA: A Could we have a second so we could
11 get a couple of pictures to help out in these questions?

12 Q Could we just go to these photos?

13 A These pictures?

14 Q Yes.

15 A Okay.

16 Q Dr. Beschta, photograph 3 is on the left and 3A is on
17 the right. As I understand, photograph 3 was taken earlier in
18 time than photograph 3A; is that correct?

19 A Yes.

20 Q What is the approximate date of photograph 3?

21 MR. TILLEMANS: A One is approximately September '87
22 and one is approximately September '93.

23 Q So the photograph 3 would be the 1987 photograph and
24 photograph 3A on the right would be 1993.

25 Now, in the photograph on the left, it appears to me

00127

1 that the water is up all the way to the banks, and indeed the
2 right-hand side of the stream channel appears as if it may be
3 about to overflow onto the land. Is that an accurate
4 interpretation of that picture, Dr. Beschta?

5 DR. BESCHTA: A That the one on the right is about
6 to overflow?

7 Q No, the photograph on the left -- the water appears to
8 be close to overflowing on the right-hand bank or at least
9 even with the banks.

10 A Ms. Scoonover, that's a very dish-like channel, so a
11 little bit more water would obviously get you up.

12 Q In the photograph on the right, Figure 3A, there
13 appears to be a substantial amount of bank showing above the
14 flow of the creek. It seems the water does not appear to be
15 ready to overflow the channel as it does in the photo on the
16 left. Is that an accurate interpretation of the pictures?

17 A You're getting bank-forming processes taking place,
18 yes.

19 Q Could the differences in photos 3 and 3A be because the
20 bed of the creek dropped about two and a half feet in the
21 photo on the right-hand side taken in 1993?

22 A A topographic dropping comparison to the elevation of
23 the floodplain or previous floodplain, is that the reference?

24 Q Yes.

25 A Well, as channels do change, yes, one of the things

00128

1 they do is deepen through time.

2 Q So the difference between the photograph on the left
3 and the photograph on the right could indeed be because the
4 channel is two and a half feet lower, the channel bed is two
5 and a half feet lower in the channel on the right than in the
6 channel on the left?

7 A You're saying the surface of the water being lower on
8 a bank is due to the bed of the channel being two and a half
9 feet lower?

10 Q I am simply asking if the differences we have
11 identified between the photo on the left and the photo on the
12 right could be because the channel in the bed on the right has
13 dropped by about two and a half feet from where it was
14 photographed in the channel on the left.

15 A It could be.

16 MS. SCOONOVER: Thank you. That's all I have.

17 MR. DEL PIERO: Thank you. Anyone else wishing to
18 cross-examine this witness at this time? No other parties.
19 Okay, fine. Staff.

20 EXAMINATION,

21 BY MR. FRINK:

22 Q I have just a few. That's one of the advantages of
23 being at the end.

24 Dr. Beschta, Ms. Cahill referred to your article in
25 Rivers which recommended a ramping criteria of 10 percent

00129

1 change per day. You explained this morning that you might
2 reword or revise that recommendation in some respect, and I
3 don't believe that you were recommending 10 percent change in
4 flow as a ramping criteria in this instance, but my question
5 is: Wouldn't there be more than a 10 percent fluctuation in
6 the daily flow rates of an Eastern Sierra stream under natural
7 conditions as a common occurrence?

8 A Yes, there would be.

9 Q Do you know approximately what the range of daily flow
10 rate fluctuations would be in the Rush or Lee Vining Creek
11 situation?

12 A On a daily basis?

13 Q Yes, under natural.

14 A Well, I guess it would depend upon whether you have
15 just got pure snowmelt or whether you have a rain on snow type
16 of event. Rain on snow would drive it up considerably, maybe
17 100 cfs, during the course of a day.

18 Q Mr. Dodge asked you about the effect of a declining
19 lake level on channel incision, and he provided you with
20 information showing that the water elevation of Mono Lake had
21 gone down approximately four feet from 1987 to 1993. The
22 Draft EIR, which I believe you do have a copy of there,
23 reports an historic low-water elevation of Mono Lake in 1982
24 of approximately 6,372 feet. That's approximately eight feet
25 below the water elevation in 1987 on the graph. Are you

00130

1 following me?

2 A Yes, I am.

3 Q And approximately three feet below the present water
4 elevation, I believe. Would you agree that if all other
5 factors are equal that a declining lake level elevation below
6 previous levels as occurred in 1982 could result in incision
7 and channel erosion?

8 A All else being equal, as you lower the lake, you would
9 ultimately expect channels probably incise to some degree,
10 yes.

11 Q Now going back and looking at the historic water levels
12 in Mono Lake, and I believe you are also looking at Figure 1-7
13 in the Draft EIR --

14 A I am looking at A-6. I am looking at the Appendices.
15 I don't have the document you are looking at.

16 Q But it does show the water elevations through recent
17 years; is that correct?

18 A It shows through 1990.

19 Q Through 1990?

20 A Yes.

21 Q What I am interested in is if the water elevation in
22 Mono Lake reached an historic low level in 1982, how would you
23 expect that to affect channel incision which might occur after
24 that date when the water level of mono lake is higher?

25 A How would the low value in '82 affect channel incision

00131

1 and higher lake levels?

2 Q Yes. The point I am getting at, I guess, is this, and
3 you can respond to it however you wish. If the water
4 elevation in Mono Lake had declined to an historic level and
5 that resulted in significant channel incision, assume that if
6 there was then a fluctuation in the water level of Mono Lake
7 significantly above that historic low level, would you expect
8 there to be substantial additional incision or would you
9 expect that that incision would have already occurred?

10 A Well, if I look at the low point, let's say in '82
11 roughly, and follow the years right after that, that's when a
12 major incision activity took place when the lake level wasn't
13 actually rising, coming up. That's in late '82. In 1983 Rush
14 Creek, for example, went through considerable incision at the
15 delta, whereas I don't believe Lee Vining did much at all
16 because it was in good shape. There was a lot of vegetation
17 down there. There was less vegetation down at the mouth of
18 the delta with regard to Rush Creek, so if you bring the lake
19 level up, and your question is will it create more incision?

20 Q That isn't exactly my question.

21 A It was a long question, and I was trying to follow it.

22 Q I am sorry, I don't think I expressed it that well.
23 What I am looking at, there was a long period of decline in
24 water elevation up to 1982, and then the water elevation rose
25 with some ups and downs, but generally rose until 1987, at

00132

1 which time it began to decline again.

2 A Right.

3 Q Would you expect significant additional incision after
4 1987, which had not previously occurred as a result of the low
5 water level in 1982?

6 A That model assumes that the lake levels are controlling
7 the incision in a major way. If I had vegetation out there
8 like we do today, it makes a big difference whether or not
9 there is going to be any incision at all happening to the
10 system. It begins to exert its effect on this system. So
11 maybe fluctuating the lake levels then doesn't exert the
12 control we had before, and the kind of flows that occurred;
13 for example, in the 80's when that second set of incisions
14 took place, there was very little vegetation to stop it from
15 going on.

16 So the low lake levels at that point along with the
17 unvegetated delta down there allowed incision to occur.

18 Q Would you expect there to be additional incision after
19 1987 that had not previously occurred?

20 A Additional incision post-'87? It is possible, it can
21 always occur.

22 MR. FRINK: Thank you. That's all my questions. I
23 believe Mr. Herrera has some.

24 EXAMINATION,

25 BY MR. HERRERA:

00133

1 Q Thank you, Mr. Frink. First of all, could you turn to
2 your written testimony on page 38, specifically Table A. I
3 note on the Appendix I a summary of annual peak average daily
4 flows for Lee Vining, 1973 to 1992, and Rush Creek, 1936 to
5 1992. Is there any particular reason why you selected those
6 dates?

7 DR. BESCHTA: A I don't believe I selected them. I
8 believe I asked for whatever they had for the period of
9 record. I asked for the records they had on peak flows.

10 Q On both creeks, and that's the data that they gave you
11 for those?

12 A That's my memory.

13 Q Mr. Tillemans, is there any additional data on flow
14 records to your knowledge, other than those data, for Rush and
15 Lee Vining Creeks?

16 MR. TILLEMANS: A Again, you would probably have to
17 talk to the hydrologist or someone.

18 MR. BIRMINGHAM: Excuse me, the DWP, pursuant to the
19 request that Mr. Herrera made last week, is going to make
20 available to the State Board Staff and all of the parties all
21 flow data that the Department has.

22 MR. DEL PIERO: Mr. Tillemans, you have not seen any
23 beyond that which is represented there?

24 MR. TILLEMANS: A I have seen -- yes, I have. I
25 have seen data other than '73 to '92. I have seen sporadic

00134

1 data in between '36 and '92.

2 MR. DEL PIERO: At this point you don't have it here?

3 A No, I don't.

4 MR. HERRERA: Q My next question goes e little bit

5 to your comment that astounding growth has occurred in

6 revegetation. I'm not sure what you mean by "astounding

7 growth". Could you expand on that a little bit?

8 A The plant density for one thing along those streams is
9 incredibly heavy. You will have a tough time walking along

10 many of those channels today because of the existing

11 vegetation. When you look at the height growth of the

12 leaders, that is pretty extensive. Two to four feet is not

13 unknown out there in willows. Cottonwoods are doing just as

14 well, so you are just seeing a tremendous amount of biomass

15 beginning to accumulate in that system, and it's happening

16 very, very rapidly.

17 Q Would you depict this growth in comparison to other

18 places that you have examined as extremely quick or rapid

19 growth in comparison to other streams you have examined for

20 regrowth or revegetation, or is it moderate, or --

21 A I would say this is on the high end of the scale. It

22 may not be the highest, but it is certainly one of the better

23 sites I have ever seen.

24 Q You further indicated that -- first of all, how long a

25 period have you been examining these two streams, Rush and Lee

00135

1 Vining Creeks, for revegetation?

2 A How long have I been on those streams looking at them?
3 Since April of 1992, the very first year after the grazing was
4 stopped.

5 Q You also stated that first and second-year plantings
6 have not developed enough to be quantified in your evaluation
7 of the stream vegetation. I am a little curious, if you
8 started in 1992 and this is a year and a half or two years
9 later, how could you quantify the existing vegetation and not
10 some of the plantings in that same timeframe?

11 A I am not sure I am picking up on your question. You're
12 saying if the plantings were started in 1992, 1991?

13 Q Prior to your involvement there, which was in 1992.

14 A If you had plantings started?

15 Q Yes.

16 A One of the things that happens with plantings is you
17 often get a first year's flush of success. That is, they look
18 like they do quite well because you are putting them in a
19 location where they have carbohydrate reserves and they can
20 make it through a year. They've got a stem, so they will do
21 quite well for the first year, and it's usually in the second
22 or third year because they have not had sufficient root growth
23 to get to the water table or get enough moisture, that they
24 begin to fail. So, oftentimes planting of a stem, whatever,
25 will look good for a year or two, and then it doesn't work.

00136

1 In contrast, generally a natural plant that establishes
2 and makes it through the first year oftentimes it is a very
3 critical year and the success of it is more assured.

4 Q So again, after two years of the plantings being in
5 place, you couldn't quantify them in your evaluations?

6 A I haven't quantified them in any evaluations, but also
7 --

8 Q Your statement earlier was that you couldn't quantify
9 them, if I was correct.

10 A No, I am saying you can't use the estimates of the
11 success after the first year as an indication of what's going
12 on in the future.

13 The other thing I guess to keep in mind is where the
14 plantings were going in were places that had, if you will,
15 destroyed or taken away native vegetation, which would have
16 existed, so there's a net loss problem.

17 Q Have you evaluated other areas in the Mono Basin for
18 reestablishing or revegetation, maybe specifically Walker and
19 Parker Creeks?

20 A I haven't spent much time on Walker or Parker. I have
21 been on Mill Creek.

22 Q Do you have any opinion as to how the revegetation is
23 coming on Walker and Parker?

24 A No, I don't have any.

25 MR. HERRERA: That concludes my questions. Thank you.

00137

1 EXAMINATION,

2 BY MR. CANADY:

3 Q Dr. Beschta, you testified, I believe, that the two
4 most effective treatments to date have been the rewatering of
5 the historic and natural side channels, and the second
6 important treatment has been the reduction of grazing of
7 livestock; is that correct?

8 A I said the most successful treatment today has been
9 putting water back in the system, rewatering the system, and
10 while that is main channel rewatering, there has been also,
11 for example, putting water into some side channels.

12 Q Then, additionally, a second important step was the
13 impact of the livestock?

14 A Oh, yes.

15 Q And you have also testified, in your opinion, that it
16 is not possible to resurrect the stream to exactly the same
17 conditions that existed in 1940; is that correct?

18 A That's true. It is true in a sense you can't put it
19 back in the same place, but you can recreate how that stream
20 functioned prior to 1940.

21 Q So the conditions that benefited it --

22 A The conditions that benefited the fish can be restored,
23 yes.

24 Q I think in your testimony you listed some long-term
25 things that need to be done, and one of those is a return to

00138

1 continuous and increased flows; is that correct?

2 A Yes.

3 Q And the idea of returning these increased flows would
4 be to allow this stream to continue to heal itself; is that
5 correct?

6 A An increase was the -- obviously there was a lot of
7 diversion going on, and that needed to be changed.

8 Q And by "healing itself", we are talking about, you used
9 the word "sinuosity," that we would expect sinuosity to be
10 increased over the existing conditions today?

11 A Yes.

12 Q We would expect to see pool development increased over
13 what it was prior to the initiation of rewatering the streams;
14 is that correct?

15 A Pools with undercut banks and cover, yes.

16 Q And you talked about that we need peak flow events or
17 whatever streamflow regime that is adopted by this Board
18 should mirror natural streamflow conditions as far as the
19 hydrographs; is that correct?

20 A I'm not sure I used the word "mirror". There are
21 features of the hydrograph that I don't think you want to go
22 beyond. If you could, for example, put four times as much
23 water down the system, and I am not going to recommend that,
24 I mean there are some flows that historically have occurred in
25 these streams. That's the natural range of conditions that

00139

1 set that system prior to 1940. They were the important
2 disturbance features.

3 If you want to talk about restoration with regard to
4 that stream system, then it's the natural disturbance pattern
5 which has really been driven by flow, that you need to begin
6 to think about, and things like ramping is one consideration,
7 not too fast, not too slow. You need to think about having
8 disturbance such as peak flows, and putting them in the range
9 of natural conditions is one way of putting some ballpark
10 estimates on it.

11 Q In those peak flows, what would be the kind of benefits
12 we would expect to get from allowing peak flows to go down the
13 channel?

14 A That's the driver. That's so important in the
15 revegetation of the system because you are putting water out
16 subsurface as well as over the surface. You are causing
17 channel alterations to take place, localized scouring and
18 fill. You are sorbing hydraulically the spawning gravels and
19 putting them in riffles where fish will use them. So it's the
20 driver that makes these systems tick.

21 Q You have seen the stream under some different flow
22 conditions; haven't you?

23 A Yes.

24 Q Do you believe a continuous flow of let's say 20 cfs
25 would allow that stream to build and do the kind of recovery

00140

1 that you are talking about with the morphology of the channel?
2 MR. BIRMINGHAM: I wonder if he could specify as to
3 which stream Mr. Canady is referring to.

4 MR. CANADY: Q Rush Creek.

5 A 20 cfs?

6 Q Yes.

7 A It will reestablish a new channel within its existing,
8 much larger channel at 20 cfs. It will develop floodplains
9 within the existing main channel, and the floodplains will be
10 very small.

11 Q But if our goal was to approximate some conditions that
12 existed in 1941 to get us back -- assume that the goal was to
13 go back to conditions in 1941, and different people have
14 described ranges of riparian cover, stream channel morphology,

15 do you believe that that can be accomplished by that flow
16 regime, a continuous flow of 20 cfs?

17 A Well, if from now on you ran 20 cubic feet per second,
18 from today, and you start running 20 cfs through that system,
19 that is your question?

20 Q Yes.

21 A All right. There's a lot of riparian vegetation you
22 could support with 20 cfs, but you would not see extensive
23 channel dynamics, you would see a collapse, if you will, of
24 the channel, you would see more vegetation coming in. It
25 would be a smaller channel, and you would not have the

00141

1 dynamics in which you would get cottonwood seedlings off on
2 the side probably. It would not be rewatering these areas, so
3 you are really shunting the system down.

4 Q So we would be restricting the recovery that system
5 could do.

6 A There is a certain potential. If 100 percent
7 represented a certain potential, that 20 cfs would push you
8 well below that 100 percent, whatever that was.

9 Q I think Dr. Platts testified, and I think your
10 testimony as well indicates that we can get some benefits if
11 we decide to rewater some of the, you didn't like the word
12 "historic channels", let's call them existing channels, that
13 occur, and we will talk about Rush Creek, that there is some
14 definite benefit from at least some season-long rewatering and
15 possibly even year-round rewatering; is that correct?

16 A You can grow more plants.

17 Q So, if the DEIR was correct, and we have lost over a
18 period of time 90 percent plus of the riparian vegetation that
19 occurred there, with the opportunity to rewater those
20 channels, we would probably do some good things for riparian
21 recovery in numbers?

22 A You might -- again, it depends upon what your
23 objectives are. Are you trying to restore the system or
24 rebuild it into something you want. Do you just want to grow
25 more trees for the sake of growing more trees, or are you

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1 trying to restore that system back to its natural dynamics or
2 some dynamics that approach what it used to do.

3 If you are building irrigation canals out there for
4 whatever reason, that doesn't fit into a sustainable picture.

5 Q Have you walked the dry channels on the southernmost
6 escarpment below the narrows on Rush Creek?

7 A I believe I have -- above Indian Ditch or below Indian
8 Ditch?

9 Q That's kind of a debate right now. I don't want to get
10 into that. But, you know, several hundred yards from the
11 narrows, if you are looking downstream it would be the right-

12 hand side of the stream, and in New Zealand I think that's the
13 right hand, would you call that a ditch or a former historic
14 channel?

15 A If I may stay above Indian Ditch, say a couple of
16 hundred yards, you are not very far, you are above Indian
17 Ditch, and there is an old historic channel right along the
18 side there.

19 Q And you walked that channel?

20 A I did.

21 Q And what would you say about the shape of that channel,
22 your recollection?

23 A The banks have sloughed, but you can see the banks, and
24 you have got a bottom there, and you have some kind of pools
25 and things happening. Part of it is dry and part of it is

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1 moist, and part of it is holding water today.

2 Q That would be a good channel if it didn't take a lot of
3 effort to put water in, at least on a seasonal or maybe
4 greater than that basis, to get some habitat back or grow
5 trees, you said, but the benefits of trees is for the aquatic
6 ecosystem and for wildlife habitat.

7 A Sure. There would certainly be some benefits, you
8 know, from the standpoint of growing more vegetation by
9 rewatering, but you begin to ask the question, well, at what
10 point do I do that, and at what point don't I do that.

11 If it requires major significant construction activity
12 out there, I think you are pushing in the wrong direction
13 because there have been some real channel dynamics take place
14 right below the narrows there, and I haven't looked at the
15 head of that side channel to really get a sense of whether or
16 not you're going to have to excavate lots of sediment to
17 connect it -- whether it takes a lot of excavation or whether
18 it's just simply pulling out a few rocks here.

19 Q I believe that Jones and Stokes looked at that in the
20 EIR. We have looked at photographs along the stream, and
21 different people have used different adjectives to describe
22 the recovery, but let's talk about Lee Vining Creek. You have
23 walked that stream several times, in fact I have walked it
24 with you several times. Now there are areas in there along
25 the stream, both on the south side of the stream or on the

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1 right-hand side of the stream and the left-hand side of the
2 stream that the remainder there is just basically cobble,
3 large cobbles; is that correct?

4 A Yes.

5 Q How would we restore that under your idea, your
6 professional opinion, and how long would it take to restore
7 those areas; and they are fairly large; aren't they?

8 A There are some significant areas that have cobble, yes.
9 Again, you have to tell me what is in your mind when you say
10 "restoration". Those systems have changed, and I can't turn
11 that clock back, and let's suppose there was a wet meadow
12 there at one time. It is inconceivable to put a wet meadow
13 back on that site.

14 Q I am talking about the ability of those, if you compare
15 those cobbles that exist today versus what their potential was
16 to support vegetation of a riparian nature, how long is it
17 going to take for that to occur, or what kind of things need
18 to happen for those particular structures to support riparian
19 vegetation like we are seeing recovering astoundingly, which
20 is one of your terms, along other portions of the stream?

21 A Well, some of these areas away from the channel take
22 longer, but there are some things going on out there that you
23 cannot predict nicely. For example, this business of
24 subsurface flows, they may leave the channel at one place and
25 show up in other places, and those pathways are not easy to

00145

1 predict, nor is the timing.

2 Putting water back in a channel will open up some of
3 those subsurface channels and move water around in strange
4 ways, and you may see wet side vegetation popping up on those
5 areas at sometime in the future. As the channel shifts
6 upstream, you may reopen some of those subsurface pathways,
7 and it is one these, and see it happening at some other time.
8 On a specific site, it is unpredictable. On a general scale,
9 it is predictable in the sense it is going to happen, but I
10 can't tell you at which site and where.

11 Q But I think you testified earlier that at some of these
12 areas the thing that is really lacking, at least today, is the
13 fine sediments; is that correct?

14 A Yes.

15 Q And so to get fine sediments on those adjacent cobble
16 bars along the stream, how would we get the sediments there?
17 Would we need overbank flooding?

18 A Some of these cobble bars are too far away from the
19 stream to get overbank flooding.

20 Q At today's conditions?

21 A Yes. You can't do everything -- that stream won't do
22 everything. Indeed, if you want to put fines way up there,
23 that is a long-term proposition. Again, the system has been
24 reset, and some sites, to restore to what I think you are
25 trying to restore to, may not be feasible in the sense of

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1 restoration.

2 Q I am not defining anything, I am trying to restore, I
3 am trying to understand. These were areas, there's big wood
4 lying in there, old big wood, and I am trying to understand
5 what, in your opinion, are the conditions that we would have
6 or would have to be created to get big wood in there, and I
7 recall you said it would help to get some sediment into those
8 cobble bars.

9 A The fine sediments are incredibly important to streams.
10 I know for many years we have looked upon fine sediment as bad
11 news to channels, particularly from a fisheries impact
12 standpoint.

13 When you look at how channels form, you look at those
14 banks today and you look at what's going on, the fine
15 sediments are incredibly important regarding species growing
16 along there. This is part of the narrowing process, it is
17 part of the bank-building process. As those areas become
18 revegetated and as we get fluctuating flows and as we get
19 floatable woody debris in that system creating local hydraulic
20 changes, you will begin to see channel changes reworking that
21 system and beginning to give you this diversity. Now if
22 you've got a cobble bar which is four feet above the existing
23 channel, it would be hard to get there. But you can certainly
24 get pines growing up there, and if there were pines growing up
25 and down that system, I expect they would be back in there.

00147

1 Q Again, getting back to my question, if you had a goal
2 of trying to establish vegetation with a continuous flow of 20
3 cfs, it would not be what we would be looking for in riparian
4 reestablishment.

5 A I don't think so. That is not how those species
6 operate.

7 MR. CANADY: Thank you. That's all I have.

8 MR. DEL PIERO: I just polled my colleagues, and none
9 of them have questions yet, but I have a few.

10 I'm sorry, Hugh, you go right ahead. I didn't see that
11 hand waving.

12 EXAMINATION,

13 BY MR. SMITH:

14 Q Two short questions. First off, pictures 3 and 3A,
15 from what Exhibit do they come? Would you identify those,
16 please, for the record?

17 MR. TILLEMANS: A These two right here?

18 Q They were called 3 and 3A, but the source was not
19 quoted. Would someone --

20 MR. DEL PIERO: Let me help you. They are out of the
21 Direct Testimony for LADWP -- no, these are different?

22 MR. CANADY: Those are out of Dr. Chapman's --

23 MR. TILLEMANS: These are also sites we duplicated.

24 MR. DEL PIERO: I understand they are representations
25 of Mono Lake. What submittal do they come from?

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1 MR. TILLEMANS: They represent sites where the video
2 was taken. The video was taken and these are stills so one
3 could see the general area that the video was panning across.

4 MR. DEL PIERO: So they are frames extracted from the
5 video tape?

6 MR. TILLEMANS: I believe they are actually separate
7 pictures and not taken from the exact video.

8 MR. DEL PIERO: That is why you can't figure out where
9 they are from.

10 MR. FRINK: Mr. Birmingham, in order that your record
11 is complete, would you wish to designate these as additional
12 Department of Water and Power Exhibits? I believe you brought
13 them up. I'm not sure who brought them up initially.

14 MR. DEL PIERO: In fact, Ms. Goldsmith, were they not
15 delivered by your staff this morning?

16 MS. GOLDSMITH: Yes, they were. Actually, these
17 pictures were here the last 10 days. These pictures were not
18 referred to in the direct testimony. They are, as Mr.
19 Tillemans has said, silent shots taken from the same tripod as
20 the video was taken, but they are not actual frames from the
21 video.

22 MR. DEL PIERO: Are you prepared to introduce them?

23 MR. BIRMINGHAM: We would designate them as LADWP 11A.
24 Eleven is the video tape that has been shown, and we will
25 designate them as LADWP 11A, 11B, 11C, and 11D, and, to make

00149

1 the record more explicit, the 1987 photo --

2 MR. DEL PIERO: Excuse me, before you -- wait a second,
3 I want to ask opposing counsel, have you seen these pictures
4 before?

5 MR. DODGE: Not to my knowledge.

6 MR. DEL PIERO: Do you have any objection to their
7 being introduced into the record?

8 MR. DODGE: No. We don't have copies, of course.

9 MR. DEL PIERO: I understand, and I assume copies will
10 be made available because I am going to direct they be made
11 available inasmuch as I don't have copies of them either.

12 Pardon me, Mr. Birmingham, for interrupting you. Do
13 you want to finish identifying them for the record?

14 MS. CAHILL: I wanted to clarify whether in fact they
15 were taken contemporaneously with the video. It's my memory

16 of the video that that foliage was green. I assume this was
17 taken at a different time of the year.

18 MS. GOLDSMITH: They were taken contemporaneously.

19 MR. ROOS-COLLINS: Cal Trout has no objection on the
20 basis of these representations.

21 MR. DEL PIERO: Did you finish, sir? Why don't you go
22 ahead and finish. I apologize for interrupting you, sir.
23 Eleven-A and B are the two standing up there, C and D are the
24 ones on the ground?

25 MR. BIRMINGHAM: Eleven-A is a 1987 photo of Rush Creek

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1 delta. Eleven-B is the 1993 photo of the Rush Creek delta.
2 Eleven-C will be the 1987 photo of the meander bend on Rush
3 Creek. Eleven-D will be the 1993 photo of the meander bend
4 along Rush Creek.

5 MR. DEL PIERO: Thank you very much. Again I apologize
6 for interrupting your question.

7 (Thereupon LADWP Exhibits 11A, 11B, 11C, and 11D, were
8 marked for identification.)

9 MR. SMITH: Q Dr. Beschta, in your testimony on page
10 36 you say that, "structural approaches to restoration are
11 unneeded and provide little functional improvement to stream
12 riparian systems." That was your statement?

13 A What page are you on?

14 Q Page 36 of your testimony.

15 A Yes.

16 Q Are you familiar with LADWP No. 15, Instream Flow
17 Analysis for Lower Rush Creek, Mono County, California,
18 prepared by E. A. Engineering? Have you read that testimony?

19 A It's an instream flow analysis report?

20 Q Yes.

21 A No.

22 Q I might again quote from page 21, "Conclusions and
23 Recommendations": "These results suggest that habitat
24 improvement for brown trout in Rush Creek may come in the form
25 of increasing the number of pools within the stream."

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1 And also, on page 22: We have certain habitat
2 enhancement measures, such as planting riparian vegetation,
3 etc., and such instream cover sources such as boulders could
4 greatly improve habitat available and should support a
5 resident population of trout.

6 Is this an apparent contradiction of your own
7 testimony, or how could you explain --

8 MR. BIRMINGHAM: Excuse me, Mr. Del Piero, I am
9 wondering if the witness can be given an opportunity to review
10 that document so he can review the statement in the context of
11 the recommendations being made. I believe it is that 20 cfs
12 be released in the stream, and that would be the permanent
13 flow.

14 MR. DEL PIERO: Dr. Beschta, do you have a copy of
15 that?

16 DR. BESCHTA: I don't have a copy.

17 MR. DEL PIERO: What exhibit is that?

18 MR. SMITH: LADWP 15.

19 MR. DEL PIERO: Do you have a copy, Mr. Birmingham?

20 MR. BIRMINGHAM: I believe I do, Mr. Del Piero.

21 DR. BESCHTA: A Which page are you on?

22 MR. SMITH: Q Page 21, the fourth paragraph, the
23 second to the last sentence, "These results suggest" -- the
24 fourth paragraph, second to the last sentence.

25 A The results are suggesting essentially that you go out

00152

1 and build pools and you don't need flow augmentation. Am I
2 reading that correctly?

3 Q I would think so, but I believe some of your former
4 testimony was that pools were in places were even counter-
5 productive.

6 A No, I am saying the kind of pools that were constructed
7 and where they were constructed and how they were constructed
8 were counter-productive. Pools are important for fish. I am
9 not taking -- I am not saying pools are unimportant for fish,
10 but when you construct pools in certain locations and don't
11 take into account the sediment transport dynamics or
12 vegetation requirements for establishment, or the
13 configuration of the pool, you are modifying a system in a way
14 that it is pretty unpredictable in a lot of cases, but
15 oftentimes has very detrimental effects. You are focusing on
16 the single view of the stream system saying, if these streams
17 just had pools, it would be wonderful.

18 These are ecosystems. They don't work on a single
19 limiting factor. They work on a whole variety of things.

20 So just building pools won't do it. If you went pools
21 in Rush Creek, they are already happening, and they are
22 happening with all the features that the research would say,
23 for example, the overhanging cover, the undercut banks --
24 that's going on, too. It's happening right today.

25 Q Also on the boulders, structural changes such as that

00153

1 -- would you disagree with that recommendation?

2 A Boulders is an interesting one. The literature is
3 inconclusive, but the published literature shows some pluses,
4 some no changes, and some negatives. And, by and large,
5 boulders by themselves are generally not looked for, certainly
6 in the Northwest, as a solution for fishery problems.

7 MR. SMITH: I have no further questions.

8 MR. DEL PIERO: Mr. Satkowski.

9 MR. SATKOWSKI: No questions.

10 EXAMINATION,

11 BY MR. DEL PIERO:

12 Q The first question, and you will forgive some of these,
13 but I am asking you for information for myself as much as
14 anything. Slow ramp-up and slow ramp-down in Rush Creek, is
15 that column based on the fact it is heavily supplied by the
16 snowmelt?

17 DR. BESCHTA: A Slow ramping up?

18 Q Yes.

19 A I am not indicating necessarily a slow ramping up. I
20 am just saying you don't want to do a dramatic --

21 Q I am asking in a natural condition, is the slow ramp-
22 up, a slow ramp-down from peak flows a normal situation given
23 the snowmelt feeding the stream?

24 A You tend to have a hydrographic that bumps its way up
25 and bumps its way down, but with some inflections as you come

00154

1 back down.

2 Q And in terms of what you are recommending for flows in
3 streams, succinctly you recommended a slow ramp-down. Do you
4 recommend a slow ramp-up also?

5 A This is where I would think it is important to go, and
6 I haven't done that analysis of what those ramps should be,
7 but the hydrographs exist to look at it.

8 Q Do you have an opinion as to what you believe the
9 hydrology of the stream was prior to 1941?

10 A Do I have an opinion as to what it was?

11 Q Yes.

12 A Well, I believe you have power generation upstream, for
13 example, at Grant Lake, and then Grant Lake was filling
14 downstream.

15 Q Below Grant Lake.

16 A Below Grant Lake; below, what was the hydrology like?

17 Q Yes.

18 A It was controlled predominantly by flows coming down
19 the Rush Creek System, but you also have tributaries feeding
20 in pulses of water.

21 Q Were pools common?

22 A Yes.

23 Q Deep pools?

24 A I suspect there were deep pools in that system.

25 Q Do you have a sense as to what the average flow during

00155

1 the summertime was?
2 A Pre-1941?
3 Q Yes.
4 A Well, there were periods, at least up at the gage,
5 where apparently zero flow was coming down through the system,
6 so you would be getting -- if you are getting water down in
7 that channel, you are looking at perhaps irrigation return
8 flows, subsurface movement of water down to some basement
9 level in the rock or in the deposit and moving laterally to a
10 location like the springs, and then coming out there.
11 Q Would that have been enough to sustain water in the
12 pools?
13 A If the pools had already been formed, that might well
14 be enough to keep water in the pools, yes.
15 Q For how long?
16 A All summer.
17 Q What kind of temperature would those be?
18 A The pools?
19 Q Yes, without flow.
20 A They would have been getting warm. They would have
21 been getting warm, but I don't have specific numbers.
22 Q Do you have a general idea given the temperature in the
23 summertime in the Mono Basin?
24 A That's a hard one to predict because it depends on
25 flow, it depends upon whether you are getting any leakage --

00156

1 Q I am going to assume no flow because that's what the
2 gage indicated, and you indicated also, and I read that.
3 Given that, tell me, given the average temperatures in Mono
4 Basin, the size of those pools that you indicated you had a
5 sense as to existing prior to 1941, tell me what kind of
6 temperatures that could have been achieved in those pools.

7 A Above 20 degrees Celsius, and I would have to convert
8 that to Fahrenheit, but 20 degrees is getting warm.

9 Q You made a statement, and I don't know if you intended
10 it -- I think this was in response to a question -- I believe
11 you said that mechanical activities of the RTC had retarded
12 natural restoration processes. Is that correct?

13 A Yes.

14 Q Can you give me an example of how that has taken place
15 in the last couple of years?

16 A This goes back to the business of trying to build pools
17 in the system.

18 Q I am focusing on where it retarded natural restoration
19 processes, as opposed to where it may retard them in the
20 future.

21 A Where it has retarded?

22 Q Yes.

23 A At the time you are building those pools, and if you
24 are destroying streamside vegetation, and let's suppose
25 everybody wants cover over the stream, which seems to be a

00157

1 desirable objective, and the streamside vegetation is
2 destroyed during that process, and the seedbed that is left
3 over is not desirable for existing vegetation, you may not see
4 anything coming in. They remain barren for a long period of
5 time.

6 So you have a problem right there as far as local
7 revegetation.

8 Q Do you know of any circumstances where that is
9 happening in terms of the RTC background?

10 A I think so.

11 Q You do? Whereabouts?

12 A Above the highway.

13 Q On Rush Creek?

14 A Yes.

15 Q How extensive?

16 A Where they build pools.

17 Q Are you suggesting that the entirety of the area they
18 excavated?

19 A The entire area?

20 Q The entire area they excavated resulted in retardation
21 of the natural restoration process?

22 A In some cases, yes. They made essentially permanent
23 changes to that stream. I mean the dredging of these
24 materials and placing them on the bank, for example, above the
25 existing water line, this is very difficult to get

00158

1 revegetation. The dredging of wetland habitat to create
2 backwater channels and putting that on top of wetland, that's
3 essentially a permanent change.

4 Q Let's talk about wetland soil then. Given the amount
5 of flow that exists, have you quantified with a model the
6 groundwater hydrology within the stream course of Rush Creek
7 and Lee Vining Creek?

8 A No.

9 Q Have you quantified with any type of mapping the
10 magnitude of the hydrologic influence of the stream on
11 groundwater within the courses or within the limited watershed
12 of Lee Vining and Rush Creeks below the impoundments, below
13 the reservoirs?

14 A No, I haven't quantified it.

15 Q In terms of riparian vegetation, riparian vegetation
16 doesn't necessarily have to be immediately adjacent to running
17 water to be established; is that not correct?

18 A That's true.

19 Q Riparian vegetation can normally be established on
20 saturated soils; is that not correct?

21 A Maybe initially saturated, but something moist
22 somewhere along the way, I guess.

23 Q Have you been able to quantify the magnitude of either
24 saturated or moist soils existing before 1941 along the course
25 of both Rush Creek and Lee Vining Creek?

00159

1 A Haven't quantified that, but I certainly have seen the
2 aerial photographs indicating that there were wet areas out
3 there, yes.

4 Q Is it appropriate to assume that those wet areas were
5 not all dependent upon overflow from the channel?

6 A That is true. A lot of them would not be dependent.

7 Q Were some of them dependent upon groundwater?

8 A Groundwater --

9 Q Whether it be underflow or percolated water, I don't
10 care, groundwater.

11 A Yes.

12 Q And can riparian corridors be sustained by groundwater?

13 A You can generally sustain vegetation through the later
14 growth stages because the trees, the shrubs, whatever, have
15 their roots down there, and they may do apparently quite well,
16 but if you don't get the reproduction coming on somewhere down
17 the road, you are asking for that system to collapse.

18 Q If an activity or an event took place that resulted in
19 water that maintained the groundwater level to be eliminated,

20 i.e., diversions, is it reasonable to assume that the riparian
21 vegetation not immediately adjacent to the direct influence of
22 the channel would decline, assuming that you had high levels
23 of groundwater?

24 A Originally?

25 Q Originally.

00160

1 A If you lost that groundwater source on these areas away
2 from the channel, it is likely you would see vegetation
3 decline and very significantly.

4 Q Would that then be a possible cause of the decline of
5 riparian vegetation along the dewatered older channels or
6 ditches that have been referred to in the testimony in the
7 cross-examination here today?

8 A The loss of groundwater?

9 Q Yes.

10 A Sure, that would contribute to it if you lost that.

11 Q In terms of flow in the watercourses of both Rush Creek
12 and Lee Vining Creek, have you quantified the amount of water
13 necessary to recharge those areas in order to allow for the
14 restoration of comparable vegetation as existed prior to 1941?

15 A The science really hasn't advanced to the point that we
16 can.

17 Q You don't have a model -- I don't know how you could do
18 it, but I am asking it anyway.

19 A We are unable to predict that. All the studies that I
20 have seen indicate the subsurface environment, the flows are
21 very complicated. It's not a simple groundwater system.

22 Q Have you done core borings and been able to develop any
23 kind of simulation as to how the groundwater system works in
24 either the watercourses of Rush Creek or Lee Vining?

25 A Neither of these two, but I have in other places.

00161

1 Q I don't doubt that. I am focusing on these two
2 particularly. Is it your experience in terms of groundwater
3 hydrology, even groundwater hydrology influenced by a
4 watercourse, that direct similarities can be found from one
5 watercourse to another, as to specific watercourses, not in
6 terms of science, not in terms of how the systems work, as to
7 specific watercourses.

8 A What I know about Rush could be transferred to Lee
9 Vining; is that the question?

10 Q I am asking: Can you compare the two directly?

11 A Not completely. Let me just explain. For example, the
12 gradient in Lee Vining is much steeper than it is in Rush
13 Creek. Rush Creek has relatively unconfined systems which are
14 low gradient, and the channel has moved around, and you have
15 finer sediments that have deposited over time, so the mere
16 surface environment is quite different than over on Lee
17 Vining. So the gradient change means the streams are going to
18 be different. Not only is the general profile different, but
19 in various locations we see differences, too. So it is not
20 easy to go from one stream to the other.

21 Q Okay, a different subject, and this question goes to
22 both of you. I would like to ask you a question about the
23 diversion dam on Lee Vining Creek. Dr. Beschta, you indicated
24 that you thought a sediment bypass would be an appropriate
25 recommendation; is that correct?

00162

1 A From a long-term standpoint of sediment recruiting
2 through that system, if you have a diversion structure that
3 you are continually emptying or had just put a large reservoir
4 on that site, you would create a condition where sediment
5 bypassing would indeed help provide and sustain what the
6 conditions were downstream.

7 Q I used to, in my previous life, have some dams. I had
8 a trusty old engineer named Joe Lagrugo (phonetic) who used to
9 go out every year and quantify as best he could for me
10 sedimentation build-up in back of each one of the dams that we
11 had.

12 Has the LADWP kept records of sedimentation build-up in
13 back of the Lee Vining Diversion Dam?

14 MR. TILLEMANS: A To my knowledge, I don't think so.

15 Q Would you know if they did?

16 A That is something that was a maintenance procedure by
17 the construction crews, and they did dredge that, and the only
18 thing I could think of is if you talk to the construction
19 foreman and ask him how many truckloads he took out every
20 fifth year, something like that, I think that might be the
21 best estimate that you could get.

22 Q Did you evaluate any calculations as to sediment
23 buildup in back of the Lee Vining Diversion Dam that resulted
24 in your making your recommendations for the sediment bypass?

25 DR. BESCHTA: A No, I had no access to numbers that

00163

1 told what was being collected.

2 Q How did you arrive at the recommendation for sediment
3 bypass? How were you able to?

4 A I made the recommendation that it be considered, so it
5 is not etched in stone.

6 Q I understand, but I assume you didn't make a
7 recommendation out of --

8 A No. The fact that they are cleaning it out says you
9 are accumulating sediments, so that's generally fine sediment,
10 as I understood, and that's material a lot of these banks
11 build from, so that's kind of the thought process I went
12 through there. I don't have specific numbers.

13 Q You made a comment that you have to install some land-
14 use impacts to remedy, I think you were referring to the
15 incision problem. Did I make a mistake in terms of my notes?

16 A I don't know if you made a mistake. I am not sure.

17 Q In terms of incision, how far back from the current
18 mouth of Rush Creek is incision a factor, not the sole factor,
19 but a factor? How many meters from the mouth is incision e
20 factor currently?

21 A On Rush Creek it is conceivable to me that you have
22 channel incision all the way up almost to the Narrows.

23 Q And how about on Lee Vining?

24 A My interpretation today would be I don't think incision
25 was nearly as significant there because you do have coarser

00164

1 substrates in that system, and it did not go down as much.

2 Q And is it safe to assume that the incision is greater
3 near the mouth than it is -- I am talking about Rush -- near
4 the Narrows?

5 A Very much so.

6 Q And it is a graduated system, it gets less as it goes
7 farther upstream?

8 A You run into multiple factors upstream. It is not
9 clear as to exactly what is causing what because, for example,
10 you have a road, you have what is known as the ford in
11 between, and you have the county road in between, and those
12 create local nick points or points of reference for the
13 stream.

14 So it is conceivable you could have the delta out here
15 incising crazy, but when you get to one of these hard
16 structures, it may slow it down or prevent it from going lower
17 than the existing structure.

18 Q Okay. The last couple of questions I have deal with
19 something that nobody talked about, not even you, so I want to
20 ask a question. I read your testimony, and I come from a
21 place where they have cows and sheep. I also come from a
22 place where there's a great amount of erosion, and, during
23 the course of my brief life, I worked a lot with the Soil
24 Conservation Service, so you will understand why I am asking
25 these questions.

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1 The grazing that took place in the Mono Basin,
2 particularly in the watershed of Rush Creek, and to a lesser
3 extent in Lee Vining Creek, went on for years; is that not
4 correct?

5 A Yes, I believe so.

6 Q Decades?

7 A Yes.

8 Q Maybe over half a Century.

9 A I would think so.

10 Q Would you characterize it as being significant grazing
11 to the detriment of the environmental resources?

12 A Yes.

13 Q Would you characterize it as grazing done to the extent
14 of severely impeding growth of natural vegetation?

15 A Some of the existing plants probably did feel the
16 effect. It was the reproduction of the young plants where you
17 would really see it. That is where the impedance would be.

18 Q There were thousands of animals.

19 A That is what I understand.

20 Q As recently as two or three years ago; is that not
21 correct?

22 A Yes.

23 MR. TILLEMANS: A It is significantly reduced in the
24 recent past as compared to before.

25 Q I understand your fences don't work so good because you

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1 had sheep come through '89 or '90?

2 MR. TILLEMANS: A I think that was a
3 misunderstanding. That was the U. S. Forest Service that had
4 a permittee running down from up north, and he took it upon
5 himself to go ahead --

6 Q I am not suggesting that LADWP did anything
7 inappropriate. I am suggesting they are still there,
8 nonetheless.

9 MR. TILLEMANS: A Okay.

10 Q I think it was you that testified to the nature of the
11 damage that resulted from their presence; is that not correct?

12 DR. BESCHTA: A Correct.

13 Q In your presentation, you talked about sedimentation,
14 you talked about the stream course. You don't talk about
15 sedimentation due to loss of natural vegetation outside the
16 stream course. Is there a reason why?

17 A Sedimentation?

18 Q That resulted from denuding of the landscape because of
19 the grazing going on. You didn't talk about any impacts of
20 sedimentation from erosion.

21 A Running off the hill slopes?

22 Q Yes.

23 A That was not an area that I was trying to concentrate
24 on. Most of my focus was on the riparian stream system and
25 not on the uplands. Now there's some obvious places where you

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1 see erosion of hill slopes where the ditch may have busted
2 loose and water came coursing down, and there are some places
3 I have seen those, and so obviously you have some source of
4 sedimentation, but I didn't focus on those.

5 Q When did grazing stop, when did the authorized grazing
6 stop?

7 A 1991 was the first year of no grazing.

8 Q Has anybody quantified the magnitude of the erosion
9 that has taken place within the watershed of Lee Vining below
10 the dam or below the dam on Rush Creek?

11 A In the channel system?

12 Q Yes.

13 A I believe so.

14 Q The erosion that resulted from agricultural activities?

15 A Oh, no, I'm sorry.

16 Q No one has done that?

17 A I haven't seen it.

18 Q So no one can then tell us what the pre-1941 condition
19 was; is that correct?

20 A You know, someone might be able to tell you, but pre-
21 1941 erosion data are very difficult to get ahold of.

22 Q Do you know if Los Angeles Water and Power has kept any
23 records of erosion at all in regard to agricultural activities
24 that took place under their supervision?

25 A Not to my knowledge.

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1 MR. TILLEMANS: A Not to my knowledge either.

2 Q Okay, one last question. Is it likely that erosion
3 that resulted from agricultural activities could have found
4 its way into the streams, either Rush or Lee Vining Creeks, or
5 in fact could have influenced riparian vegetation along those
6 watercourses?

7 DR. BESCHTA: A Again, I see some evidence on the
8 photographs going back to 1929. You have got some alluvial
9 fans that impinge upon these streams, and there might be some
10 sediment coming off.

11 Q When I went on a field trip, I saw a bunch of it. I
12 was wondering if you saw the same thing.

13 A Yes, it's there, but as far as the overall story goes,
14 I don't feel that is the major factor that happened out there.

15 Q It is not a major factor that happened out there -- you
16 have not calculated it?

17 A I have not calculated it, you are right.

18 MR. DEL PIERO: Thank you very much.

19 Now it's 4:30. We can start again with re-cross, Mr.
20 Birmingham, or you can go home if you want.

21 MR. BIRMINGHAM: May I ask Dr. Beschta his availability
22 tomorrow. My preference, having three hours sleep last night,
23 would be that we go home.

24 MR. DEL PIERO: Can you be here tomorrow?

25 DR. BESCHTA: I have a real problem. I have classes.

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1 MR. DEL PIERO: Who wants to take Dr. Beschta's classes
2 for him? Mr. Canady is a college professor.

3 MR. BIRMINGHAM: Mr. Del Piero, may I ask Dr. Beschta's
4 availability on the following day? The reason I ask is
5 because we have another witness tomorrow, John Melack who is
6 a professor at Santa Barbara, and Dr. Melack has asked to leave
7 for Europe for a shuttle of experiments.

8 MR. DEL PIERO: When is he leaving for Europe?

9 MR. BIRMINGHAM: I'm not sure.

10 MR. DEL PIERO: Nobody goes to Europe, Mr. Birmingham,
11 unless I do. (laughter)

12 MR. BIRMINGHAM: I don't know. Ms. Goldsmith could
13 answer that better than I can. But we had talked to counsel
14 about calling Dr. Melack out of order, and I believe we had the
15 concurrence of counsel, and we were going to make that request
16 tomorrow of the Hearing Officer, so perhaps if Dr. Beschta
17 could return on Wednesday -- he is not enthusiastic about that
18 either.

19 MR. DEL PIERO: Doctor, you can't do it on Wednesday
20 either?

21 DR. BESCHTA: I don't like walking away from my
22 classes. I have tried to rearrange, and today I did, and I am
23 running into a problem.

24 MR. DEL PIERO: Folks, I am sorry -- Mr. Birmingham,
25 you know what we are going to do? We are going to do it

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1 tonight. Okay. Why don't you go ahead and start?

2 MR. DODGE: Mr. Chairman, Mr. Birmingham is literally
3 dead on his feet. We would like to accommodate that, and if
4 Dr. Beschta can come back sometime and finish this up, we
5 would be happy to do that.

6 MR. DEL PIERO: Hold it. Let me give you some dates,
7 Doctor. Actually, I have been doing some business up here.
8 We have scheduled the 8th. That's today. The 9th, the 10th.
9 We have also scheduled the 15th, 16th, and 17th. Ladies and
10 gentlemen, I would like to indicate right now it is my
11 intention to go into the evenings on all three of those days
12 unless I hear some vehement complaints.

13 MR. FRINK: Mr. Hearing Officer, I spoke with Mr. Zabel
14 of EPA at noon today, in response to his letter requesting a

15 definite time that their witness could appear, and he is
16 requesting that his witness be able to appear on the morning
17 of November 15.

18 MR. DEL PIERO: Fine. Dr. Beschta, is that a good day
19 for you?

20 DR. BESCHTA: Is the 16th open?

21 MR. DEL PIERO: Yes, sir.

22 DR. BESCHTA: That's my best shot.

23 MS. DEL PIERO: That's your day. Mr. Birmingham, Mr.
24 Dodge, is that acceptable?

25 MR. DODGE: That's fine.

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1 MR. DEL PIERO: Ms. Cahill?

2 MS. CAHILL: Yes.

3 MR. DEL PIERO: Ms. Scoonover?

4 MS. SCOONOVER: Yes.

5 MR. DEL PIERO: It's done. Mr. Haselton is gone, so I
6 don't have to ask him.

7 Where I left off, we have the 15th, 16th, and 17th
8 scheduled. Mr. Canady, you may well be prepared to go into
9 the evenings on those days. We have scheduled the 2nd and 3rd
10 of December, and we also scheduled the 6th, 7th, and 8th until
11 3 p.m. We are using the 8th until 3 p.m. because we are
12 observing the holiday. I also have scheduled the 13th and
13 14th, but those days are scheduled for me to go back down to
14 San Bernardino to do the Big Bear hearing with Mr. Stubchaer.

15 It is my sincere hope I don't have to do that. If you
16 have been there you would know why. And if, in fact, that is
17 the case, and I am able to get the two days of hearings done,
18 I think we are on for next week, then we will have the 13th
19 and 14th open also.

20 It is probably safe to assume that you ought to plan on
21 going into the night on Thursday, the 2nd, Monday, the 6th,
22 and Tuesday, the 7th.

23 And then, for dates after the 13th and 14th -- for
24 dates after the 8th I will have more information either
25 tomorrow or the next day, and I am keeping in mind your 19th.

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1 Are you leaving in the morning or evening?
2 MS. SCOONOVER: Very early in the morning.
3 MR. DEL PIERO: How did I know that answer. So you are
4 not here on the 19th; right?
5 MS. SCOONOVER: No, it's a Sunday.
6 MR. DEL PIERO: We will do what we can. In the event
7 it poses a real problem, do you have counsel to replace you?
8 MS. SCOONOVER: Yes, I do.
9 MR. DEL PIERO: Anyone else have plans to leave for the
10 Christmas holiday early? Mr. Dodge.
11 MR. DODGE: I don't have any plans to leave, but I have
12 a schedule to work on another case. I really do have one or
13 two other cases and may not appear on the week of December 20.
14 I would personally much prefer the week of December 27.
15 MR. DEL PIERO: The week between Christmas and New
16 Years?
17 MR. DODGE: Yes.
18 MR. FLINN: He would prefer that, but that's not a
19 unanimous position.
20 MR. DODGE: I thought you had given us overnight to
21 figure this out among ourselves.
22 This is just me and my client and Mr. Flinn.
23 MR. DEL PIERO: Let's see how we can play this out.
24 The week of the 13th, Monday is the 13th -- it may well be
25 that we are going to become very close friends during those

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1 five days. We don't have the times and the room scheduled for
2 that week, but you may just as well be prepared for that week.

3 It's the Board's desire, and this is all five members
4 of the Board, to have this matter completed before Christmas,
5 and we are going to do the very best we can to make sure that
6 my four colleagues aren't upset with me.

7 So much for that. Now that we have got that settled,
8 Mr. Birmingham is going to get to go home and go to sleep.
9 Dr. Beschta, you are done I think for the day.

10 We will begin with your Redirect when he returns. Who
11 is on tomorrow?

12 MR. BIRMINGHAM: Dr. John Melack and Dr. Wim Kimmerer.

13 MR. DEL PIERO: Do we have any clean-up issues to take
14 care of before we adjourn for the day. Are these the only two
15 gentlemen here for tomorrow, because if they are and this
16 process goes on late -- I mean we can't keep doing this,
17 folks, so they need to be prepared to stay here tomorrow
18 night, and so does everyone else if this is the only day they
19 are available.

20 MS. GOLDSMITH: This is the only day Dr. Melack is
21 available.

22 MR. DEL PIERO: I'm sorry, folks, we are going to be
23 here until we get finished tomorrow night in terms of --

24 MR. DODGE: We will be finished in the early afternoon.

25 MR. DEL PIERO: Mr. Roos-Collins, you have a frantic

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1 look on your face.

2 MR. ROOS-COLLINS: I am listening to my esteemed
3 colleague, Ms. Cahill, at the same time. We have no problem.

4 MS. CAHILL: Was it just Dr. Melack or someone else?

5 MS. GOLDSMITH: Dr. Wim Kimmerer and Dr. Melack.

6 MR. DEL PIERO: Any problems, Ms. Scoonover, any
7 problems?

8 MS. SCOONOVER: No.

9 MR. DEL PIERO: We will see you tomorrow morning at 9
10 o'clock.

11 (Evening recess.)

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