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BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES AND ENERGY
IN AND FOR THE STATE OF UTAH

* * * *

INFORMAL CONFERENCE ON THE)
WILBERG MINING AND RECLA-) REPORTER'S TRANSCRIPT
MATION PLAN APPLICATION)

* * * *

On Thursday, March 29, 1984, commencing at the hour
of 10 a.m., an informal conference was held before the Division
of Oil, Gas and Mining in Room 4110 of the State Office
Building, Salt Lake City, Utah, 84114; and the hearing was
reported in shorthand by Ronald F. Hubbard, a certified
shorthand reporter in and for the State of Utah (License No.
32).

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A P P E A R A N C E S

* * * *

Dianne R. Nielson, Director
Ronald Daniels, Associate Director for Mining
Mary Boucek, Reclamation Biologist & Permit Supervisor
Division of Oil, Gas and Mining

Barbara W. Roberts
Assistant Attorney General of the State of Utah

Interested Parties:

Edward S. Crawford
Herm Olsen, Attorney for Mr. Crawford

Utah Power & Light Company
Ralph Jerman, Attorney for Utah Power & Light

Jack Moffitt, Bureau of Land Management

Tom Suchoski, Ford, Bacon & Davis

Dee W. Jense, Utah Power & Light Company

Chris Shingleton, Utah Power & Light Company

Glen F. Tiedt, Office of the Solicitor, U.S. Department of
the Interior

Stephen F. Manger, Office of Surface Mining

Shirley F. Lindsay, Office of Surface Mining

Ben A. Grimes, Plateau Mining Company, Price, Utah

I N D E X

EDWARD S. CRAWFORD 10 24 24 26

VINCENT LAMARRA 27 73 78

9/1/84



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1 SALT LAKE CITY, UTAH, THURSDAY, MARCH 29, 1984, 10 A.M.

2 * * * *

3 THE DIRECTOR: This is the time and place we have
4 set for an informal conference in the matter of mining and
5 reclamation plan for Utah Power & Light Company's Wilberg
6 coal mine, ACT/1518 in Emery County, Utah.

7 The purpose of the conference today is to provide
8 an opportunity for interested parties to present information
9 which will be of value in evaluating the mining and reclama-
10 tion plan which has been submitted by Utah Power & Light
11 Company on the Wilberg coal mine.

12 I understand there is also some interest in discus-
13 sing the Deer Creek Mine; and within the scope of this confer-
14 ence, which I emphasize again is informal and is simply an
15 information conference, a fact finding conference, we're will-
16 ing at this point to entertain those additional comments. I
17 want to emphasize that this is in no way a hearing. The pur-
18 pose is to provide information to better evaluate and establish
19 criteria for a permit, and we're anxious for anyone who has
20 information which they would like to present at this conference
21 to take the opportunity to do so, because the point of it is
22 to get information out on the table so that it can be consider-
23 ed.

24 At this time I'd like to have any interested parties
25 who are likely or intending to want to make comments at the

1 conference this morning to please identify themselves for the
2 record. I would also like to note that anyone who is interest-
3 ed in having a transcript of the hearing should leave a busi-
4 ness card with Mr. Hubbard, so the arrangements can be made.

5 What interested parties are planning or likely to
6 make a comment this morning?

7 MR. OLSEN: Herm Olsen, attorney, representing Edward
8 S. Crawford.

9 THE DIRECTOR: Any others?

10 MR. LAMARRA: Vincent Lamarra, consultant, repre-
11 senting Edward S. Crawford.

12 MR. CRAWFORD: I am Edward S. Crawford.

13 THE DIRECTOR: Anyone else? All right. There is
14 an attendance slip being circulated, and I'd appreciate it if
15 you'd take the time to sign that also. Herm, would you like
16 to begin?

17 MR. OLSEN: I have a couple of preliminary matters
18 that I'd like to address first. It's my understanding that
19 there may have been a deficiency in the notice for the hear-
20 ing; but pursuant to instructions from OSM and the Division's
21 request, it was decided to continue the hearing anyway. So
22 we are here. I don't know exactly what the deficiencies may
23 or may not have been. So, of course, we're not prepared to
24 waive any objections we'd have to that, but we'll go ahead and
25 proceed anyway under that presumption.

1 Is OSM represented?

2 THE DIRECTOR: Yes. OSM is represented by Steve
3 Manger and Shirley Lindsay.

4 MR. OLSEN: Additionally, we had previously requested
5 from OSM a technical assessment prepared by I think Simons &
6 Lee relative to the application. It was the determination
7 of OSM that that would not be released to us prior to
8 the hearing. We think that is an incorrect determination, but,
9 nonetheless, are willing to proceed.

10 It's our understanding that that will become avail-
11 able to us within--is it 30 days after the application is
12 approved or denied?

13 MR. TIEDT: Yes.

14 MR. OLSEN: Mostly we wanted it to expedite the hear-
15 ing today, so that we wouldn't have--

16 MR. JERMAN: Could you speak up just a little bit?
17 We can't hear you.

18 MR. OLSEN: And that may be a problem. I suppose
19 mostly I'm going to be talking to her and Ron.

20 THE DIRECTOR: Why don't we shift around?

21 (Discussion off the record.)

22 MR. OLSEN: So we do make a request formally that
23 that be made available to us at the soonest time that the
24 Division or the OSM determines that we're entitled to it.

25 Also, there seems to have been some confusion,

1 maybe on our part, the Division's and OSM, as to exactly which
2 regulations are applicable there. In communication with Ron
3 Daniels, it's our belief at this point that the Utah regula-
4 tions are what we are operating under and what we are going
5 to be discussing, except with two exceptions, those being
6 relative to the petition for areas unsuitable for surface
7 effects of mining activities and the--what is it?--the informal
8 conference itself.

9 MR. CRAWFORD: Mine plan.

10 MR. OLSEN: That's right. The mine plan extraction.
11 Other than that, we're presuming that the Utah regulations
12 apply.

13 MS. ROBERTS: Yes.

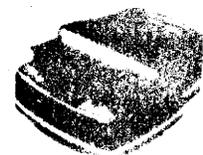
14 THE DIRECTOR: That's correct.

15 MR. OLSEN: Inasmuch as this is an informal confer-
16 ence, we're going to try to keep it as non-attorney-witness-
17 examination-cross-examination format as we can. We invite
18 comments and questions as we proceed. But I'm assuming that's
19 acceptable.

20 (Ms. Roberts nods head.)

21 MR. OLSEN: The Administrative Procedures Act is
22 apparently waived for that and the normal rules of evidence
23 and that sort of thing. So we'll proceed on that basis.

24 I'd like to indicate maybe the four things we intend
25 to touch on, and then we'll just launch into it, the first



1 being that the ways in which Mr. Crawford's property is
2 affected by the Wilberg mining plan, by the mining itself.
3 No. 2, the areas of deficiency that we've discovered in the
4 application itself by Utah Power & Light have, when compared
5 to the state and federal regulations.

6 No. 3, what we perceive the duty of the Division and
7 OSM to be, relative to those deficiencies.

8 And, No. 4, we will peripherally discuss my client's
9 eligibility as we perceive it to be designated as a land un-
10 suitable for the surface effects of coal mining activities,
11 and in conjunction with that, submit a petition to the Division
12 and to OSM to that effect.

13 I guess we'll provide three copies, one for the
14 Division, one for OSM, and one for Utah Power.

15 THE DIRECTOR: Just for the record on this. Herm,
16 could we put a number or letter designation?

17 MR. OLSEN: Surely.

18 THE DIRECTOR: Just so we can keep it straight.

19 MR. OLSEN: What do you want to call it?

20 THE DIRECTOR: Exhibit A?

21 MR. OLSEN: All right. That's fine.

22 (Exhibit A was marked for
23 identification.)

24 MR. OLSEN: I didn't put on that map--attach that
25 map.

The two people that we wanted to present information



1 to you today are Mr. Crawford, who is the joint surface owner
2 of 302 acres of East Mountain, and Dr. Vincent Lamarra, who
3 is the director of Ecosystems Research, Inc., at Logan, Utah.
4 Through this presentation, I think the evidence is going to
5 show that the permit application submitted by UP&L for the
6 Wilberg Mine is structurally deficient, meaning that there are
7 portions of the applications which simply do not address the
8 requirements of the regulations.

9 Secondly, the information will show that the permit
10 application is substantively deficient and that it does address
11 some of the requirements required by the regulations, but not
12 adequately.

13 Third, that Mr. Crawford's land is suitable for
14 designation as an area unsuitable for the surface effects of
15 coal mining.

16 Finally, that the mining which already has occurred
17 has impacted now, already, Mr. Crawford's lands and water
18 rights. So that it's not conjectural only, but the impact is
19 real.

20 So I'd like Mr. Crawford at this point to begin his
21 presentation, and I will set it up in question and answer form,
22 but I will just invite him to discuss things. I'll try to
23 make sure he covers the things we wanted him to and ask him
24 questions if necessary to make sure that that's covered.

25 MR. JERMAN: Before we proceed, I'd like to ask one



1 question. He's presented us with what appears to be a peti-
2 tion to have this area declared unsuitable for mining. I
3 would assume that this is not the proper place to present this
4 petition. Yet, that's one of the things you're bringing up
5 today?

6 MR. OLSEN: Well, we're not going to discuss the
7 petition per se, and this is not the hearing provided for by
8 the regulations for the petition but today is the day that
9 it has to be submitted. It is hereby submitted to the Division.
10 You're given a copy.

11 Some of the questions addressed in the petition are
12 pertinent for the discussion today.

13 MR. JERMAN: Perhaps that's so. I would object,
14 however, to any consideration of this petition on today's
15 hearing. I don't think this is the time and place for that.

16 MR. OLSEN: Well, as to the petition, I don't disagree
17 with you; but as to the information necessary to discuss, we
18 will present it.

19 THE DIRECTOR: I think what I'd like to do, if no
20 one else has any objection, is hear information that would be
21 useful in terms of considering approval of the mining and
22 reclamation plan. To the extent that this is information that
23 is also going to be considered as part of this petition, I
24 think we recognize that there may be some overlap. I think
25 this is not an appropriate place to discuss the merits of the



1 petition per se, but strictly to be a situation where we
2 present information that may in fact bear on this petition at
3 some future time. Is that agreeable?

4 MR. OLSEN: That's what we have in mind. Our peti-
5 tion does call for a hearing on that issue, but, of course,
6 not today.

7 THE DIRECTOR: And just for the recorder's assistance,
8 although he recognizes a number of familiar faces, if you
9 address a question, if you could identify yourself for the
10 record, it would be appreciated. Thank you.

11 EDWARD S. CRAWFORD

12 called as a witness in his own behalf, being
13 interrogated, answered as follows:

14 EXAMINATION BY MR. OLSEN

15 Q Just to start out, Mr. Crawford, why don't you explain
16 to the Division your background as it relates to the property,
17 where it is, and tell why you're interested.

18 A Yes. I'm Edward S. Crawford. I'm a native of Emery
19 County, born and raised there. My family has been in the
20 ranching business there throughout their lives. I first became
21 acquainted with East Mountain in about 1936 in connection with
22 our livestock operations, when we used to go there in our
23 branding operations.

24 At that time it was a completely primitive area,
25 much of it reaching elevations 10,000, 11,000 feet high. There



1 were no roads in the area at all. We continued that type of
2 operation up until 1967.

3 Upon the death of my parents, we sold our ranch properties
4 in the valley and held onto our property on East Mountain to
5 develop it strictly as a recreational property. This property
6 has been zoned for that purpose.

7 We only took to isolate the property from grazing. We
8 did run in common with the Forest Service. Prior to that time
9 we fenced the property and undertook to develop the water in
10 the area. We've developed numerous springs. By developing,
11 I mean you go back to the source of the spring and either box
12 it in or drain it out into a collection point or ditch it or
13 otherwise. These are the type of developments I have reference
14 to.

15 At the same time we were doing this work, we did build
16 a cabin in the area, and we do occupy that cabin at the present
17 time. It's pretty much a summer home to us down there.

18 Other developments that would have taken place in the
19 area is reseeding. Much of the area was pretty well overgrazed
20 by the time we fenced it off, and we have sprayed the sage
21 brush and carried on quite an extensive revegetation program;
22 and we do have grass in the area now that will drag your stir-
23 rups, and we're quite proud of it. So we do have adequate
24 water resources in the area to carry on the activities that
25 we had planned and developed some cabin sites, and we have



1 sold three cabin sites in the area.

2 Q Can you describe the water, the number of springs and
3 streams, and whatever else?

4 A We have in the Cove Basin, which is surrounded by a
5 terrace, underneath the top of East Mountain, a layer that
6 springs outcrop all the way around, and we have approximately
7 eight springs around that terrace and along the bottom. We
8 have a stream that runs along the bottom of our property and
9 drains directly into the Wilberg Mine.

10 We have given some consideration to developing this stream
11 into a fishery and have done some work in that regard also.
12 But the springs are generally located around this terrace and
13 in the bottom along the stream. The stream itself originates
14 on our property after the spring runoff, and that's the source
15 of the stream from there on out.

16 MS. BOUCEK: Mr. Crawford, does the stream have a
17 name?

18 A It's the Left Fork of Grimes Wash.

19 Q (By Mr. Olsen) When you say that's the Left Fork, is
20 that what you would describe as a perennial stream?

21 A Yes.

22 Q Are there any perennial ponds or intermittent streams on
23 the property?

24 A We do have some ponds in the upper areas. We have three
25 ponds there that are glaciated and usually one of them stays



1 full pretty well throughout the summer. Some of the others
2 fill up during the early runoff and do become quite low later
3 on in the season. But one of them stays pretty well full
4 throughout the year.

5 We do intend to pipe some water from one of the springs
6 into this pond and develop it further.

7 Q And are there any ephemeral streams or springs on the
8 property?

9 A Yes. Above the source in the bottom, after the spring
10 runoff that area pretty well dries up. Above the main
11 springs that are on our property in the bottom.

12 Q Are there eight perennial springs?

13 A There are eight flowing springs that we have filings on.

14 Q And one perennial stream?

15 A Right.

16 Q Describe the lay of the land. And why don't you distri-
17 bute to the Division these pictures and what they are and
18 explain them to them, if you would.

19 A This is high mountain conifer aspen mountain meadow type
20 land. As I stated earlier, it's 10,000 feet high; and from
21 our cabin site area it overlooks the San Rafael Swell and the
22 LaSal Mountains and the Henry Mountains, and on a clear day
23 you can see those areas. You could up until the time they
24 built the power plant. They accumulated quite a bit of smoke
25 in the area. This one gives you an idea of the view from the



1 top.

2 As I stated before, we do have heavy grasses and conifers
3 and aspen types throughout the entire area.

4 And this gives you some idea of what the cover is.

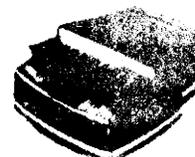
5 The rainfall in the area ranges from 25 to 30 inches
6 annually. And so it is adequate to sustain the various browses
7 and grasses that are present in the area. And we do have a
8 good wildlife population there also that's prevelant, and this
9 is one of the areas that we did intend to capitalize on. There
10 are 125 head of elk there in the area by actual count and pro-
11 bably five times that many deer.

12 And they are sustained, of course, by the water in the
13 area and the vegetation and the cover that is present there
14 at the present time.

15 Q You indicated that you intend to use it and develop it
16 for recreational purposes. Would you tell them what has trans-
17 pired in that regard?

18 A Well, our original intent was to sell cabin sites and
19 develop it for hunting type area. The East Mountain is re-
20 nowned for its scenery and hunting. It's one of the best
21 hunting areas in the area, and we have had hunting parties in
22 there from as far away as Michigan. It's an outstanding area
23 for that particular purpose, and we do hope to capitalize on
24 that particular--

25 Q What have you sold any cabin sites for? How much?



1 A We've sold three cabin sites for \$5,000 for an acre and
2 a quarter.

3 THE DIRECTOR: Is there a water right that goes
4 along with that?

5 THE WITNESS: The springs that we have developed.

6 THE DIRECTOR: All right.

7 THE WITNESS: Right.

8 Q (By Mr. Olsen) You mean with the individual cabin sites?

9 A Yes.

10 THE DIRECTOR: They have the use of that spring?

11 THE WITNESS: Right.

12 Q (By Mr. Olsen) Have you observed any adverse impact on
13 the surface of your property?

14 A Of course, Utah Power & Light has conducted a monitoring
15 program every year, and that's available here through the
16 Division. We have also conducted our own monitoring program,
17 and we have found that the springs in the area where the long-
18 wall machine is presently operating, which is the lower portion
19 of our property now, have indicated some severe stress on the
20 surface. Two of those springs run adjacent to us to the
21 south now dry up within 100 yards of their source. One of the
22 streams on the bottom of our property has dried up completely.
23 At least, the last two times we visited that area last fall.

24 Q Would you describe whether or not that's a change since
25 1980?



1 A Yes. We have figures, joint figures with the power
2 company and our own, starting in 1979; and, of course, they
3 continue on from there, and this indicates quite a severe
4 drop from those original base line figures of 1979.

5 We have noticed adjacent in the same area some subsidence,
6 and we took some pictures of this last fall when we were there,
7 and this gives you some idea. This is in the area of the
8 springs we were talking about. And also the area where the
9 long-wall machine is presently operating to the south of us.

10 Q Who took those pictures?

11 A I did.

12 Q Are they actually on your property or adjacent property?

13 A No, they're adjacent property right straight south of
14 us.

15 Q How far would you say?

16 A I would say within possibly three to four hundred yards.

17 THE DIRECTOR: Excuse me. But I asked a question.
18 The springs that you're indicating that have been drying up
19 near their source are on your property?

20 THE WITNESS: One of them is on my property. The
21 other two that I referred to showing the most stress is right
22 straight south of our property.

23 THE DIRECTOR: All right. And the long-wall opera-
24 tions would be operations at the Wilberg Mine?

25 THE WITNESS: The Deer Creek Mine.



1 THE DIRECTOR: The Deer Creek Mine. Thank you.

2 Q (By Mr. Olsen) The pictures that you've shown here, are
3 they the only geologic disturbance that you've noticed in the
4 last five years?

5 A No. We've had a severe disturbance that was investigated
6 by the Division and the Power Company. It is quite a large
7 mud slide. It is a very sensitive area and a steep area on our
8 property, and it is subsiding; it is a large mud slide in that
9 area.

10 Q That was in 1979?

11 A Right.

12 Q Can you just recite for the Division what the effect of
13 that inspection was?

14 A Well, I advised the Division and OSM that we were ex-
15 perencing the subsidence in the area. I didn't indicate it
16 was from mining, but we were experiencing subsidence. It was
17 from the slide. In back of this slide the ground was subsid-
18 ing away. So they wanted to go down and take a look at it.
19 So we went down and inspected it, and that was the result of
20 the inspection.

21 Q All right.

22 A And a report was made of that by the Division, by the
23 way.

24 Q Is this the report that you were talking about (handing)?

25 A Yes. That's the report, and it indicates the sensitivity



1 in the area in that particular point.

2 MR. OLSEN: I'd like Dianne to submit the photo-
3 graphs as some numbered exhibits.

4 THE DIRECTOR: How about Exhibits B, C, and D.

5 (Exhibits B, C, and D were marked
6 for identification.)

7 MR. OLSEN: Additionally, I'd like to submit the
8 report from James W. Smith, Jr., a reclamation of soils
9 specialist, regarding the slide that Mr. Crawford just indi-
10 cated. I'll submit the entire report, but I'd just like to
11 read what I think are the pertinent factors.

12 Upon inspection of the disturbance, it was deter-
13 mined the damage had naturally taken place. The area is
14 naturally unstable due to a combination of many factors, such
15 as the geology and the unconsolidated surface material, the
16 soil characteristics, the steep slope, and climatic conditions.
17 The instability of the area was evidenced by older slides in
18 the vicinity and characteristic curving of the tree trunks.

19 I'd like to submit that That would be Exhibit E.

20 (Exhibit E was marked for
21 identification.)

22 Q (By Mr. Olsen) Who was Mr. Smith employed by, do you
23 know?

24 A The Division of Oil, Gas and Mining.

25 Q To your knowledge is there mining occurring under or
around your cabin?



1 A A room and pillar mining has occurred underneath my cabin,
2 yes.

3 Q How about underneath the intermittent and perennial
4 stream and springs?

5 A My last inspection of the mine plan at the USGS, the mine
6 supervisor's office, within the past ten days indicates that
7 they are under those springs at the present time.

8 Q When you say under those springs, are you talking about
9 the springs upon which you have observed an impact?

10 A Yes. The ones that are south of us. Of course, it's
11 my understanding the most recent intrusion into our property
12 has been recently. So I haven't had an opportunity to observe
13 what in fact we might be able to look at this spring when we
14 go down there.

15 Q I just have one more area for you to cover, Ted, that's
16 the general area. Why did you get involved in all this?
17 What triggered your interest?

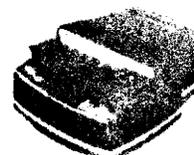
18 A In 1976 the Utah Power & Light Company in connection with
19 their power plant in Emery County published an EIS, and part
20 of that EIS indicated that there would be severe subsidence
21 and loss of water on the surface area.

22 Q Let's see--

23 A On East Mountain.

24 Q Is this the EIS that you're talking about?

25 A That is the EIS.



1 MR. OLSEN: I suppose that you have access to this;
2 and rather than submit this as an exhibit, what I think we
3 would like to do is to submit what we perceive to be the--we'd
4 like to submit it all, I suppose, by reference, and let you
5 take note of it, but submit for an exhibit what we perceive
6 to be the pertinent parts Xeroxed out of the EIS.

7 THE DIRECTOR: I don't have a problem with that.

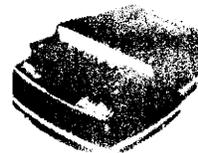
8 Q (By Mr. Olsen) Just to describe what those sections are
9 that caused you concern, what is it that the EIS triggered your
10 concern about?

11 A Well, just let me read this one section to you.

12 "Subsidence may occur on 4,658 acres of land above the
13 Wilberg Mine as an estimated 70 percent of the coal is removed.
14 The estimated depth of subsidence would be from one to five
15 feet for about 3,508 acres of the leased area. About 800
16 acres of the seam being mined on the Wilberg portal lies be-
17 neath the seam being mined from the Deer Creek portal. Subsidi-
18 dence would be expected to double above this tract at approxi-
19 mately five to ten feet as both the seams are mined. A rela-
20 tively narrow peripheral zone around the leased area would also
21 experience some subsidence, but this would be hardly even
22 discernible. There are presently insufficient data to estimate
23 the extent of occurring surface cracks, boulders, or sink holes "

24 Q Interpret that, will you? What does it say?

25 A In effect, it says they're going to remove two seams



1 of coal from underneath our property, the Blind Canyon and the
2 Hiawatha. And when they remove those two seams of coal, we
3 can expect ten feet of--about the height of this room--you can
4 expect our property to drop that far. And the loss of water
5 associated with it could also occur; and, that being the case,
6 water being the life blood of the entire area, we would be
7 entirely high and dry with that type of situation.

8 Q Does your property lie within the three or four thousand
9 acres that the EIS recognized the subsidence on?

10 A Yes, and it lies within the 800 acres that will be mined
11 both by the Deer Creek and the Wilberg Mine.

12 Q All right. What else?

13 A Well, it goes on further here to indicate that:

14 "Subsidence following mining operations could intercept
15 ground water aquifers above the mined area. Springs, including
16 nine that have been measured, could be affected, with a pos-
17 sible loss of over 180 acre feet per year of surface discharge.
18 The subsidence would also eliminate stream flow in reaches of
19 Romes Canyon, Deer Creek, and the head waters of Grimes Wash."

20 Q What does that mean?

21 A Well, that means that the aquifers above the mining opera-
22 tion will be ruptured. The water will drop down into the mine;
23 and rather than come out and run on the surface, they will come
24 out the mine portal.

25 Q Is there anything else identified--



1 A And essentially that's what's happening today. Those
2 mines are producing--when the Danielson Report was published
3 in 1979, the Deer Creek was producing 650 gallons per minute,
4 and the Wilberg was producing 450 gallons a minute. And I
5 assume since that time that figure has probably doubled.

6 Q Is there any data to demonstrate the production of water
7 from the mines?

8 A Danielson's Report, which we have here.

9 MS. ROBERTS: Mr. Crawford, are those numbered, so
10 that we can find them?

11 THE WITNESS: I guess we could give you this as an
12 exhibit if you wanted it.

13 MR. OLSEN: I think it may be worthwhile to submit
14 this. In fact, I've got a copy of it. Here it is. Let me
15 submit as Exhibit F the sections taken from the 1976 EIS,
16 which was prepared by Utah Power?

17 THE WITNESS: Yes.

18 (Exhibit F was marked for
19 identification.)

20 Q (By Mr. Olsen) And in conjunction with--

21 A The Bureau of Land Management was the lead agency in pre-
22 paration of the documents.

23 MR. OLSEN: All right. And the pages I believe are
24 numbered in here, citing you to the pages in the EIS.

25 MS. ROBERTS: Thank you.

Q (By Mr. Olsen) Is there anything else particularly out



1 of here--and we submitted that to them, and they can review
2 that. Is there anything else particularly that you want to--

3 A I think the rest of it is pretty well repetitious, and
4 the portions that I read are pretty well the heart.

5 Q Do you have anything else you want to cover?

6 A I think that pretty well covers it.

7 MR. DANIELS: Maybe for the purpose of the record,
8 the EIS document that's referred to here as EIS actually
9 appears to be the draft EIS. I don't know if there is a dif-
10 ference in the final and the draft.

11 MR. OLSEN: I don't either. It says, "Draft,
12 Environmental Statement, Emery, United States Department of
13 the Interior, BLM."

14 THE WITNESS: That one is June of 1976. I believe.

15 Q (By Mr. Olsen) Has there been a final?

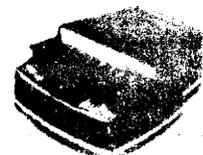
16 A As I recall, the final is essentially the same.

17 THE DIRECTOR: There is a final of that. Does any-
18 body know if there are significant changes in that portion?

19 MR. DANIELS: I have no idea.

20 MR. OLSEN: Are there any questions?

21 MR. JERMAN: I'd like to direct a question to the
22 chairman. We are concerned about some of the statements
23 Mr. Crawford made, and I think a lot of them are false and
24 misleading. We don't want to get into an adversary proceeding.
25 But how can we handle these concerns? We think it has to be



1 property was zoned for recreational cabin sites.

2 A Yes.

3 Q What's the minimum lot size?

4 A I think it's 10 acres.

5 Q So you could get a maximum of 30 lots?

6 A I assume so.

7 Q You also mentioned that you had developed springs on the
8 property. Is that correct?

9 A Yes.

10 Q What do you actually have in the way of adjudicated water
11 rights on that area?

12 A I have the filings.

13 Q I'm not talking about filings. I'm talking about the
14 water rights that you actually have adjudicated.

15 A Well, there are diligence rights that have been there since
16 the water has been used.

17 Q How much water do you have the right to use?

18 A We have the right to at the present time, as I recall,
19 to use three acre feet. And the irrigation company has ad-
20 vised us if we will transfer additional water up there, we can
21 have the right to do that.

22 Q Who has advised you of that?

23 A The irrigation company. The Cottonwood Creek Irrigation
24 Company. There is more water than three acre feet in the
25 area, unless it all disappears; but if we want to transfer



1 additional water up there from the Cottonwood Creek, we can.

2 Q Is it your understanding that the mining is occurring
3 underneath the Wilberg Mine underneath your property?

4 A No.

5 Q You're not contending that's going on?

6 A The Deer Creek is presently underneath us.

7 Q You recognize there is no long-wall mining--

8 A At the Deer Creek, yes.

9 Q When did you sell these three cabin sites?

10 A 1976.

11 Q And you haven't sold any since then?

12 A No.

13 Q Are you aware of any of the adjudicated water rights that
14 the Utah Power & Light Company has in that area?

15 A I understand Utah Power & Light has bought some property
16 in the area, and I suppose they do have some water rights in
17 connection with those purchases.

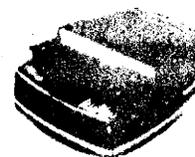
18 EXAMINATION BY MR. OLSEN

19 Q Let me ask, growing out of that, when you say they've
20 bought property in the area, is that over the mountain--

21 A No. It's right adjacent to us.

22 MR. OLSEN: All right. I see.

23 MR. JERMAN: And the rest of our response we will
24 make by our own people, either a written response or after he
25 finishes.



1 THE DIRECTOR: Fine. Any other questions?

2 MR. OLSEN: Thank you. We can go back, I suppose.
3 If there are questions that arise that Mr. Crawford can ad-
4 dress, why, I suppose we can go back to them.

5 THE DIRECTOR: Yes. I would hope we can keep this
6 open enough so we might have comment all through the hearing.

7 MR. OLSEN: All right. I'd like to have Dr. Lamarra
8 testify or discuss what he wants to discuss now. So I will
9 introduce him.

10 VINCENT LAMARRA

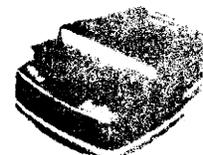
11 called as a witness on behalf of Mr. Crawford,
12 being interrogated, answered as follows:

13 EXAMINATION BY MR. OLSEN

14 Q Would you give me your name and describe your educational
15 background for the Division, please.

16 A Dr. Vincent Lamarra. I am director and president of
17 Ecosystems Research Institute, environmental consulting firm
18 in Logan, Utah. My educational background is I received a
19 bachelor of science degree in natural sciences from Fresno
20 Pacific College and a Ph.D. in ecology and behavioral biology
21 from the University of Minnesota, 1976.

22 I spent six years teaching as an assistant professor in
23 the department of wildlife science, Utah State University.
24 I also spent a year as a research adjunct professor at the Utah
25 State University in the water research laboratory, at which



1 time I was principal investigator on a project funded by the
2 Office of Water Reserach and Technology, United States Govern-
3 ment, looking at the hydrologic balance and mine water accruals
4 of selected mines, including the Deer Creek and Wilberg Mine
5 on the Wasatch plat and the Book Cliff area, coal mining areas.

6 Three years ago I became president and director of the
7 Ecosystem Research Institute, an environmental consulting firm.
8 We've had a number of clients which have dealt with mining
9 permit applications, both oil, coal, and oil shale in Utah and
10 Wyoming and Colorado. So we have some experience in review-
11 ing applications.

12 I belong to a number of professional societies: American
13 Society of Limnology and Oceanography, International Society
14 of Theoretical and Applied Limnology, and a member of the
15 Lake Management Society.

16 I have a number of refereed publications in period review
17 journals, as well as have given quite a few professional
18 papers at professional societies. I have also authored a book
19 on resource management of the Colorado River Basin.

20 In 1980 and 1981, Mr. Crawford retained me to do an en-
21 vironmental assessment of the aquatic habitats on his property,
22 the information of which I will provide as evidence in this
23 informal hearing.

24 About five months ago he also asked me to consider review-
25 ing the mining application as objectively as I possibly could;



1 and I would like to stress that many of the things that I
2 would like to point out probably can be answered directly
3 by Utah Power & Light, and I hope they would be able to, you
4 know, address some of the deficiencies that I found. I per-
5 ceive that the deficiencies are--might be oversights or what-
6 ever.

7 But, nevertheless, I sat down with the regs, the regula-
8 tions, the same ones we see here, as well as their mining
9 application. And I notice that in the areas of concern, which
10 would be Section 784.14, which is the Reclamation Plan, pri-
11 marily the Protection of Hydrologic Balance, and the subsequent
12 Section 784.15--excuse me. I'm sorry. Which one is the one
13 on the subsidence?

14 Q 784.20.

15 A Right. 784.20. Those are the two major areas that I
16 felt I had some expertise in that I could evaluate the mining
17 documents. I don't have an expertise in mining engineering.
18 As far as the mining plan is concerned, I can address some
19 questions that cross-reference the mining plan.

20 One of the things I did find out in those two sections
21 is that they are essentially identical in the Wilberg and
22 Deer Creek Mines, except several tables were different, the
23 page numbers were different, and the insertion of Deer Creek
24 for Wilberg Mine. Basically they address essentially identi-
25 cal issues.



1 At the same time, I also evaluated the monitoring pro-
2 grams and the monitoring documents presented to the Division
3 by Utah Power & Light in their annual reports up through 1982.
4 The 1983 subsidence monitoring and the hydrologic monitoring
5 is not available at this time, hasn't been submitted yet.

6 MR. OLSEN: Let me just interrupt there. This is
7 the addition that ought to be given for the petition. So let
8 me give you copies that should be attached as an addition to
9 Exhibit A (handing).

10 THE DIRECTOR: So it's an addition to Exhibit A?

11 MR. OLSEN: Yes.

12 Q (By Mr. Olsen) The impression I get, Vince, is that what
13 you did is you read the regulations, and then you compared the
14 apparent requirements of the regulations to the application;
15 is that what you're saying?

16 A That's right.

17 Q Why don't we start through beginning on 784.14 and
18 describe what you found.

19 A As far as the regs are concerned, we can start on page
20 84 and cross-reference that to the mining application,
21 Volume 4.

22 Q I noticed at the back of the room on the table are several
23 large volumes, which appear at first blush to be the mining
24 application. Is that in fact the case?

25 A If those are the ones that are in black. yes, I think they



1 are. We looked at both of them, both the Wilberg and the
2 Deer Creek.

3 Q So the information that you're going to be testifying
4 about came from the mine application; is that correct?

5 A That's right. Well, I really--I guess the best place
6 to start is at the beginning. As I said before, you know, I
7 tried to make an objective evaluation; and many of the comments
8 that are made in the mining application reference the monitoring
9 plan, both for hydrology and subsidence. So that's the reason
10 I looked at those documents, because they substantiate some
11 of--or, don't substantiate some of the conclusions drawn in
12 the application. And so when appropriate, I'll talk about the
13 information that they cross-reference and point out some
14 things.

15 Under the Utah Mining Code, there is a series of cross-
16 references that I think are fairly important, and I think in
17 the cross-referencing and meeting the requirements of those
18 cross-references are where there are some substantial defi-
19 ciencies as I perceive them.

20 And so what I'd like to do is sort of go through what the
21 regulations require, and then essentially point out what Utah
22 Power & Light, or the applicant, has done, and then go to the
23 cross-references and talk about some of the deficiencies that
24 exist.

25 And as I said before, the two major areas that we're going



1 to be looking at will be the protection of the hydrologic
2 balance. What we--what I personally perceive as happening is
3 that some of the key issues relative to the hydrologic
4 balance have not been addressed. And some issues have been
5 addressed, although not adequately. And it primarily concerns
6 a hands-on knowledge of what the East Mountain environment
7 looks like and the critical factors which must be preserved
8 or restored in order to maintain that environment. And that's
9 the critical issue here as I perceive it.

10 Okay. In the beginning, in part (a) it says:

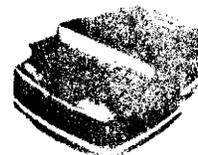
11 "Each plan shall contain a detailed description, with
12 appropriate maps cross-section drawings, of the measures to
13 be taken during and after the proposed underground coal mining
14 activities, in accordance with UMC 817, to ensure the protec-
15 tion of."

16 And it talks about the quality of the surface water, the
17 rights of present users to surface and groundwater, and,
18 finally the quantity of surface and groundwater both within
19 the proposed mine and adjacent area from adverse effects of
20 the proposed underground coal mining activities."

21 MR. JERMAN: What page are you reading from?

22 THE WITNESS: Page 84.

23 Q (By Mr. Olsen) Sometimes it's hard for me. I'm sure the
24 Division understands exactly each and every word that you read,
25 but I'm a layman, and sometimes it's hard for me to work



1 through this stuff. "A," tell me exactly what it is that the
2 reclamation plan should contain.

3 A Well, it's--it's got to provide a detailed description
4 that will insure the protection of several sub-items, which
5 would be the quality, the right, and the quantity of surface
6 and groundwater. And I guess what we should do now is pri-
7 marily the quantity of surface groundwater in accordance with
8 the cross-references of 783.17 and 817.54. And the critical
9 issue here is the concept of quantity.

10 Now, if we go to the mining application under 784.14 to
11 the Wilberg or the Deer Creek mine, you see that they address
12 the issue in the following manner--

13 Q What page are you reading from?

14 A I believe it's Volume 4, page 34 or 34--34 or 35. They
15 might be different for either one of the applicants, Deer Creek
16 or Wilberg.

17 They state in here that:

18 "Although precautions are being taken to protect the hydro-
19 logic regime of the Wilberg Mine area, it is still possible
20 that the groundwater systems will be altered. The normal
21 downward movement of groundwater may be interrupted when it
22 intersects the mine workings. These waters may flow laterally
23 through the mine workings to a point where they flow down through
24 fractures to permeable strata. The impacts from this occurrence
25 should be minimal, because the water will only be temporarily



1 detained or redistributed."

2 Well, the concern that I have is--

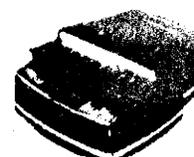
3 Q Would you translate that? What was said?

4 A Well, basically what they're saying is there is a possi-
5 bility that that subsidence or mining activities may result
6 in water from groundwater now, and that's a critical issue
7 here, moving horizontally--or, vertically down through the
8 ground, through various what were normally impermeable strata
9 ending up in the mine.

10 Q When I first looked at that, I didn't know and understand
11 the difference between ground and surface water. In the event
12 someone else was similarly confused, would you briefly explain
13 that?

14 A When you talk--well, when you talk about the hydrologic
15 balance, you're talking about the whole hydrologic cycle,
16 which would include precipitation, evaporation, from the
17 surface, sublimation of the surface, evapotranspiration, the
18 movement of water into the groundwater system, and the ultimate
19 discharge of that groundwater through seeps or springs which
20 we know exist on these mountains into channels and ultimately
21 moving down.

22 Danielson in 1981 essentially put together a back-of-the-
23 envelope calculation for the East Mountain, Cottonwood drain-
24 age, which is what is of concern to us. He noted that only
25 2 percent of the precipitation runs off as overland flow in



1 that drainage, but 98 percent of the precipitation recharges
2 groundwater, which is a fairly massive amount of water.

3 Q So could you answer my question? What's the difference
4 between groundwater and surface water?

5 A Well, groundwater is contained underground that can be
6 discharged in the form of surface water.

7 Q Surface water is what you see?

8 A That's right.

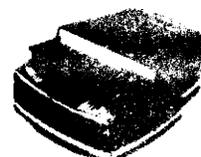
9 Q All right. Now, so the first issue that they state is that,
10 yes, there might be an impact to groundwater. Okay. Now, the
11 discharge of that groundwater may also acknowledge as being
12 potentially impacted in the following paragraph:

13 "The springs on East Mountain above the Deer Creek Mine--"
14 And this includes Mr. Crawford's property and the springs on
15 and adjacent to his property. "--might be affected by subsi-
16 dence due to mining."

17 And they make this proviso:

18 "It is possible that (1) some of the groundwater flowing
19 to the springs would be diverted to different areas forming
20 new springs, increasing the flow of existing springs. It is
21 also possible that some water might be diverted from the sur-
22 face downward along fractures caused by mining," which means
23 the springs will disappear.

24 Well, they really pretty much covered themselves. In
25 essence, they have said you could cause new springs, could



1 increase the flows or decrease the flow, or you could do nothing
2 at all. So in essence, this says they don't know what's
3 going to happen.

4 "The majority of the springs will be unaffected by mining
5 activities because of the use of controlled subsidence techniques
6 and the ability of fractures within the strata to spontaneously
7 heal by swelling clays."

8 They offer no proof at this point that that could happen,
9 and in investigating the location of the various springs--and
10 I should point out that we look at the strata of rock on the
11 cove--we're talking about an area that is a depression in the
12 ground. It's a large cove, abandoned river channel or a serf
13 basin, in which you have a rim around two-thirds of it opening
14 to the downstream, and you can see these fairly closely. Let
15 me see this one right here.

16 Okay. This is a view looking from the top of the rim,
17 which would be--

18 THE DIRECTOR: Excuse me. This would be Exhibit B,
19 I believe.

20 THE WITNESS: Right. And looking at the top of the
21 rim out towards the open space. So it's like a horseshoe
22 being at the front of the horseshoe looking down.

23 Q (By Mr. Olsen) Those are just duplicate pictures?

24 A Right. The photograph down here, these two photographs
25 here, are looking in the opposite direction. They are looking



1 from one of the sides up into the cove. So you can see--
2 basically you can see the rim around the side, and then the
3 vegetation growing down through.

4 Now, what's happened is that there is what they call the
5 Flagstaff Formation, which is a shale. And this is described
6 in detail by Danielson's report and by the existing environ-
7 ment section of their mining application, which is quite ade-
8 quate, by the way.

9 Q You've mentioned Danielson's report a couple of times.
10 Do you have that with you?

11 A Yes, I'm going to give that to them right now. The
12 section I'm referring to is Section 783.13, Volume 2, which
13 is Hydrology and Geology, General Requirements.

14 The mining application discusses this, as does this docu-
15 ment produced by Danielson, which is a cooperative effort with
16 the U. S. Geological Survey and the Division of Oil, Gas and
17 Mining, State of Utah, which was done in 1977 to 1979 and pub-
18 lished in 1981 as an open file report.

19 MR. OLSEN: Now, rather than introduce that document,
20 maybe we can just have you take note of it, because I'm sure
21 you've got one on file.

22 THE DIRECTOR: I think that's fine. To the extent
23 you are going to give information from it, indicate the section
24 and page numbers.

25 THE WITNESS: Right. Basically when we're talking



1 about the hydrologic regime on the East Mountain, we're talking
2 about a majority of the water falling as precipitation, and
3 we freely admit, as does Danielson's report, that the Flagstaff
4 is very permeable, very fractured. And so water freely moves
5 down to that. But this is the Flagstaff Formation here. Under-
6 neath the Flagstaff Formation is called the North Horn Forma-
7 tion, which is where most of the springs on Ted's property
8 elude from.

9 And primarily, this is what they call an interbedded or
10 a meticolated material, where you have old abandoned river
11 channels or stream channels that are filled with a permeable
12 material where water moves down through down here and is dis-
13 charged.

14 In their monitoring program, Utah Power & Light notes
15 quite adequately, by the way, that the springs in the North
16 Horn Formation are recharged by annual precipitation. And
17 I'll point out that data in just a second.

18 Below the North Horn Formation is a formation called the
19 Price River Formation. and this is of concern to us. And I'll
20 talk about it in just a second. It's primarily a sandstone
21 with some interbedded clays.

22 Now, in looking at the drill logs provided by Utah Power
23 & Light in a publication given to the Office of Surface Mining
24 in 1977, they indicate that these interbedded clays, which in
25 fact are what they are referring to in this document, as being



1 the potential for swelling and sealing, spontaneously sealing
2 any cracks, exist only in the top 100 or 200 feet of the Price
3 River Formation.

4 And so several springs on Ted's property may or may not
5 exist within this interbedded sequence. We don't know. In
6 fact, nobody knows right now. So it's almost--a high proba-
7 bility exists, if not a reasonable doubt exists as to whether
8 or not there are any of these interbedded clays below the
9 spring source that might be impacted by mining activity. If
10 there is no interbedded clays, then this swelling phenomena
11 that they talk about cannot occur in this particular formation
12 where some springs exist right now.

13 Below this is another formation which is called the
14 Castlegate Formation, which is a really coarse sandstone with
15 no interbedding in it at all.

16 Down here the coal seams, there is a distance of approxi-
17 mately, from the mouth of the cove to the coal seams I think
18 it's maybe 1,200 feet, something like that of overburden. To
19 the top up here is as much as 2,400 feet approximately.

20 So in later discussions we'll talk about the lack of a
21 worse case scenario in the documents versus a best case
22 scenario. They continually talk about subsidence in terms of
23 a best case scenario, which is maximum overburden and, there-
24 fore, minimum impact. But we'll talk about that in just a
25 second.



1 Okay. So now we're getting to the point where they're
2 talking about the groundwaters, or some of these springs spon-
3 taneously healing up here. And there is firm evidence which
4 indicates that the geology and the lithographic features of
5 the stratum might indicate there are no interbedded clays of
6 any substance that could potentially cause this phenomena
7 they're referring to.

8 Q (By Mr. Olsen) Let me ask this. Where they talk about
9 the possibility of sealing, what time frame are we looking at,
10 if in fact sealing could occur? Are we talking about two
11 months or 20,000 years?

12 A I don't know. It could--you know, it's possible that it
13 could occur instantaneously. It could take 100,000 years.
14 You know, I don't know. It's not--the time frame is not men-
15 tioned. It talks about spontaneous healing.

16 In Danielson's report he makes an interesting comment.
17 He talks about the phenomena of purged water tables, which
18 would be a water bearing zone above an unsaturated zone. And
19 he talks about in the East Mountain area, there is not enough
20 ample evidence to describe the aquifers, whether purged or
21 otherwise in the area. He says that there is ample evidence
22 which indicates that there is hydrologic connection between
23 these various strata.

24 If that's the case, then these interbedded clays have not
25 sufficiently sealed those interconnections in a naturally



1 occurring fracture, and there might not be any reason to
2 suspect that they would occur in a man-made-caused fracture.
3 There is ample evidence, at least in his document, that there
4 are hydrologic connections through these interbedded areas
5 right now up there.

6 Okay. So in essence then, if we look at the--go back to
7 the application--the question is, and the one that I had to
8 ask, is 784.14(3) adequately addressed? And primarily, as it
9 exists to the cross-referenced document, which is 783.17--
10 and we can look at 783.17 right now.

11 Q What page was that?

12 A Okay. That is--

13 Q That is page 74, isn't it?

14 A Yes. Right. 784.17. Okay. Now, as part of--what did
15 you say it was?

16 Q 74.

17 A Okay. Now, as part of this particular section, which is
18 783, there are certain requirements for information on environ-
19 mental resources. A description of the geology, geologic
20 description, et cetera.

21 And it also states that there has to be an alternative
22 water supply information provided if they suspect that surface
23 water or groundwater will be affected. And they have to pro-
24 vide those alternatives.

25 If you look at the mining document, they suggest



1 alternatives for the restoration or the reclamation of the
2 waters' impact. And I would refer you back to Volume 2, page
3 99, of the Wilberg Mine Plan. And I quote under 783.17 of the
4 mining plan or the mining application.

5 "The mining completed in the Wilberg Mine may alter or
6 disrupt the flow of water on the surface." That's critical
7 here of East Mountain. "Presently, these waters are put to
8 limited use of livestock, wildlife, or in a few cases for
9 culinary water for cabins, which Mr. Crawford is doing right
10 now.

11 "If the mining activities affect the surface water, the
12 first alternative is waters from an adjacent spring may be
13 diverted to flow into the areas where other springs have
14 stopped flowing."

15 That's the first one.

16 "Secondly, if springs on East Mountain were not ample,
17 water supply to replace a disrupted water, then water would
18 be pumped to the surface from the Wilberg Mine, surrounding
19 streams, or wells could be developed on the property."

20 We have just briefly calculated how much water and the
21 time frames that we're talking about here. If we go to the
22 first one, you're assuming there that some--that all--that only
23 part of the springs would be impacted by subsidence or mining
24 activities.

25 There is a distinct possibility that they all might be.



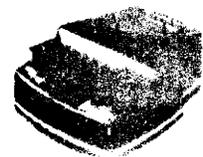
1 So there may be no surface water to move. The question is,
2 in looking at the properties, especially the terrestrial
3 vegetation, they are finely tuned to the location of springs.
4 The conifer bands that we see are not just associated with
5 surface discharges, they are also associated with small lateral
6 seeps that occur. That's where the dense vegetation is at.

7 If you were to go in and develop these areas that may not
8 be impacted by mining, you're going to ultimately affect the
9 terrestrial environment by dewatering some of these areas, and,
10 therefore, the potential vegetation would be impacted. That's
11 the first one.

12 If we look at the springs on East Mountain, they will pump
13 water to the surface from the Wilberg Mine.

14 The monitoring program conducted by Utah Power & Light
15 and noted--and also by Danielson notes that the water quality
16 in the mines is sufficient--is substantially different. It's
17 a lot harder water, contains a lot more total suspended solids
18 than the surface water does at the present time. So the water
19 would not only have to be pumped, but it would also have to
20 be pre-treated, which would include maybe filtration, settling,
21 and quite possibly chlorination.

22 THE DIRECTOR: Could I ask you a question? To the
23 extent that additional waters coming into the mines were in-
24 itially from springs or seeps that had been disrupted in that
25 area, is it likely that the water quality of this additional



1 water would also change as it came into the mine?

2 THE WITNESS: Well, the--in the mining application--
3 or, in the monitoring program, they talk about the amount of
4 water coming out of the mines. I'm going to disagree with
5 Ted. Danielson's report talks about only 250 gallons per minute
6 coming out of the mines in '77.

7 There is over 500 or 600 gallons per minute coming
8 out of the mines. And the data that they presented in their
9 monitoring programs shows a continual increase in the volumes
10 of water generated out of the mines. And this quality pretty
11 well remains in the same degraded state. I think it just has
12 to do with the fact that show they're handling the water in the
13 mines. It doesn't necessarily mean that once mining operations
14 are complete that this water could not, you know, without, you
15 know, the mining activities, the oil, the dust suppression,
16 which all adds to the water--the degradation of the water qual-
17 ity--that might not exist any more.

18 So the water quality may improve, in fact, with the
19 discharge after mining operations are completed. We don't
20 know.

21 But based on present data, it would have to be
22 treated in the interim. And here is the--this is from the
23 Wilberg Mine, and this is the discharge from 1979, and this
24 is Figure 14 from the monitoring program. And you can see that
25 they have drawn a regression line. And they indicate that



1 there is an increase of about 3,500 gallons per day through
2 the whole time period since 1979. And that's when Danielson's
3 report was done. So you can see Danielson was talking 200,
4 250, and they have an average now of 400 or so.

5 So the mine--the production of water in the mine has
6 drastically increased fairly substantially. Okay. Now, the
7 critical issue here is whether or not these alternative water
8 supplies can even be considered as being feasible for surface
9 water restoration. We're talking about pumping. If we look
10 at the maximum flows of the springs, they're talking about 125
11 gallons per minute being pumped forever, as long as these
12 springs do not heal themselves.

13 And so when you multiply it out, we're talking about
14 64 million gallons a year that would have to be pumped just
15 to replace the surface water on the East Mountain property
16 alone, just Ted's property alone. And that amounts to about
17 a third of a CFS.

18 And we have issues like operation and maintenance
19 of the pumping facilities. Not only that. We're talking about
20 as much as a 2,400-foot head if the North Horn Formation
21 springs are affected, and a 1,200-foot head if the Price River
22 Formations are affected.

23 And that's--you know, that's a major concern to Ted
24 is that if we lose the surface water, if this is the alterna-
25 tive for replacement, you know, how are we going to do it



1 physically?

2 The other thing is that wells could be developed on
3 the property. Well, in the document defined in the existing
4 environment, Utah Power & Light admits that it's extremely
5 difficult to locate aquifers in the area, because of the fact
6 that you have these lenticulated sandstone channels existing
7 throughout the strata.

8 So it's a hit or miss chance whether or not you even
9 hit one of these aquifer systems. So, again, it might be
10 highly impractical, in order to use this as a potential alter-
11 native.

12 Now, that basically covers the protection of the
13 hydrologic balance according to surface water. Nowhere in
14 the documents do they talk about a reclamation plan relative
15 to the aquifers that exist in the mine plan. To me that is
16 a ~~major~~--go ahead.

17 Q (By Mr. Olsen) I was going to ask you now, you're saying
18 that the application addresses whether adequately or inade-
19 quately remedial action for surface water, but you're saying
20 that pursuant to 784.14(a)(3), both surface and groundwater
21 have to be addressed; is that right?

22 A That's right.

23 Q And you're saying that the application is void of any
24 remedy to disruption to groundwater?

25 A That's right.



1 A Nowhere in the mining plan do they talk about how they're
2 going to address the potential for disrupting the groundwater
3 sequence. They talk about the surface distribution of the
4 groundwater, which is a manifestation of the groundwater dis-
5 charge; but they don't talk about how they're going to handle
6 or remedy or mitigate the loss of groundwater.

7 Now, as I mentioned before, and as Danielson mentions in
8 this particular document, this North Horn Formation through-
9 out the whole formation you have discharging of water in very,
10 almost undiscernible areas. This leads to substantial vege-
11 tation and growth. And he has some pictures of this document,
12 and I pointed them out. The same thing happened in the cove
13 area, the South Fork of Grimes Wash.

14 That is of concern to us, yes. Potentially, theoretically,
15 we could mitigate the loss of surface water, but by pumping
16 or distribution of streams, bringing it over from Elk Springs,
17 which I understand Utah Power & Light might have water rights
18 on. But the question is, what do we do about the subsurface
19 aquifers, and especially the seeps or very diffuse distributional
20 sources that have led to the environmental situation that we
21 have on East Mountain, which, according to Mr. Crawford, he
22 would like to develop into a recreational resource at some
23 point.

24 So if you lose the vegetation, you start losing the con-
25 currence of wildlife and so forth and so on. So that's a



1 major concern. As I stated before, the subsurface part of
2 the hydrologic balance simply hasn't been addressed in the
3 mining document.

4 Let's see. There was another one on page 196 of the
5 regs, the cross-reference to 817.57.

6 Q Are you talking about UMC 817.54?

7 A Let me see. Just a second. 41 is what I want first.

8 As was noted before, 817.54 and 817.41 both have to be addressed,
9 and one of them deals with the consequences--another deficiency
10 in the application is that the consequences of mining activity
11 have not been determined. That's page 176.

12 Q Yes.

13 A Okay. On 817.41--okay--on 817.41, Hydrologic Balance,
14 General Requirements, it states:

15 "(A) Underground coal mining activity shall be planned
16 and conducted to minimize changes to the prevailing hydrologic
17 balance . . . in order to prevent long term adverse changes
18 in that balance that could result from those activities."

19 I maintain that they haven't done that for the groundwaer
20 as of yet.

21 Secondly, (b):

22 ". . . the quantity in the depth to groundwater, and in
23 the location of surface water drainage channels shall be mini-
24 mized so that the approved postmining land use of the permit
25 area is not adversely affected."



1 We maintain that without protection of the groundwater
2 that the proposed use of the land, which would be recreational,
3 the aesthetics would be impacted."

4 Q Now, what you're talking about--and you referenced 817.54--
5 the water rights replacement. Right? Is that what you were--

6 A Right.

7 MR. OLSEN: I am willing, in fact anxious, to be
8 educated on this matter, because I'm not sure exactly how to
9 interpret 817.54.

10 But it looks to me like, as I read that--and let me
11 read what I think are the pertinent parts.: "Any person--"
12 Now, let's see. This is an asterisked one. And that means
13 that this section is remanded?

14 MS. BOUCEK: Yes. I was going to bring up that a
15 couple of the sections that have been referred to have either
16 been suspended or remanded; and those are 783.17, and the
17 first--I don't know if it's totally remanded. One of the
18 hydrologists back there may know.

19 MR. SUCHOSKI: On 783.17, the statement which refers
20 to supplying an alternative, describing that, and documenting
21 that has been remanded. The remainder of it, the requirement
22 to supply water is still in effect.

23 MR. OLSEN: Let me make sure I understand. The obli-
24 gation of an applicant to describe alternate sources in the
25 application is no longer necessary?



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MR. SUCHOSKI: Right. According to federal court decision.

MR. OLSEN: But the obligation to provide the alternate sources of water is unaffected?

MR. SUCHOSKI: Right. In other words, UP&L, if they affect the water supply, have made a statement that they will provide water. That is all that's required.

MR. OLSEN: Now, when you talk about that, are you talking about surface water or surface water and groundwater?

MR. SUCHOSKI: As far as this is worded, it just requires that for a water right that that water be replaced.

MS. BOUCEK: If you get your water from a stream, it would be surface water. If your water right is from a well, it would be groundwater. So it could be applicable to either.

MR. OLSEN: When you say applicable to either, that's because 784.14(3) still has the requirement for the ground and surface water?

MS. BOUCEK: That's correct. That has not been affected. 817.54(a) has been remanded.

MR. OLSEN: All right. And tell me what the legal impact of remanded is.

MS. BOUCEK: Remanded? Barbara, maybe you would like to speak about that.

MS. ROBERTS: All that means at this point is that



1 in the state program that we are not addressing that when we
2 are here looking at mine plans. That, however--what did you
3 say? 817.54?

4 MS. BOUCEK: Paragraph (a).

5 MR. OLSEN: 817.54, there's just one paragraph.

6 MS. ROBERTS: I have two paragraphs in mine.

7 MS. BOUCEK: Well, the second paragraph, "Nothing
8 in this Chapter shall be construed so as to diminish or inter-
9 fere with the authority of the State Engineer to regulate
10 state water rights," is still in effect. In other words, the
11 Division would have to consult with the State Engineer's
12 office when it comes to any analysis of interrupted water rights
13 for a requirement to supply alternative water.

14 MR. OLSEN: I guess I'm asking, has the Division
15 taken the position whether or not the application is required
16 to comply with 817.54?

17 MS. ROBERTS: At this point, this is not in the
18 State regulations. This has been remanded by a district court,
19 federal district court decision. And so, therefore, we're not
20 addressing that when we're looking at an application.

21 MR. TIEDT: I think if you look in the Federal
22 Register in the federal regulations that that section is
23 affirmatively disapproved at this point.

24 MR. OLSEN: All right. And I understand that in
25 April the regulations are to be amended. Is that correct?



1 THE DIRECTOR: There will be recommendations presented
2 on asterisked rules.

3 MR. OLSEN: Is the State going to propose to rein-
4 state this or just eliminate it altogether?

5 MS. ROBERTS: The State will at that time propose
6 to remove from this book anything that has been asterisked,
7 and at that point then we will start looking at what needs to
8 be added back and how to put that back in.

9 But at this point, in April all we're doing is address-
10 sing what has been asterisked and what has been affirmatively
11 disapproved.

12 MR. OLSEN: And so at this point, it looks like
13 817.54 will be eliminated and is now remanded? Is that
14 right?

15 (Ms. Boucek nods head.)

16 MR. OLSEN: All right. Thank you.

17 THE WITNESS: Is 817.57, Hydrologic Balance: Stream
18 Buffer Zones, still in the regs?

19 MR. OLSEN: Yes.

20 MS. ROBERTS: Yes.

21 THE WITNESS: Well, as I pointed out before, in
22 1981 Mr. Crawford asked me to conduct a biological survey to
23 determine based upon the regs whether or not the upper part
24 of the Left Fork of Grimes Wash could be classified as a per-
25 ennial stream. As he pointed out before, several springs



1 discharge into the upper portion of Grimes Wash, which result
2 in a fairly constant stream flow.

3 At the present time Utah Power & Light is monitoring
4 the water flow in the Grimes Wash area, and they have recorded,
5 I think, minimum flows of about 30 gallons per minute, leaving
6 their stage gauge at the base of Grimes Wash. That's for 1982
7 data.

8 Now, I conducted a survey in October of 1981. In
9 the mining document, Utah Power & Light maintained that the
10 upper part of Grimes Wash probably does not flow during the
11 late fall, winter, and early spring prior to snowmelt because
12 of either ice conditions or basically low discharge from the
13 spring.

14 As you know, 1981 was a drought year. We had very
15 little snowfall up there. The springs were not recharged to
16 any great extent. So I went late in the fall, during a drought
17 year. And my survey I would like to give you now in essence
18 states that based on--

19 MR. OLSEN: Let's identify that as Exhibit G.

20 (Exhibit G was marked for
21 identification.)

22 THE DIRECTOR: Excuse me. Do you have additional
23 copies of that?

24 THE WITNESS: I might have one, if I can find it.

25 THE DIRECTOR: If not, I can pass this over to you.

THE WITNESS: I've got another one here somewhere.



1 Here it is. Here you go.

2 MR. OLSEN: I gave him a copy.

3 THE DIRECTOR: All right. Fine.

4 THE WITNESS: As part of the 817.57(a), it says:

5 "No land within 100 feet of a perennial or an inter-
6 mittent stream and which contains a biological community
7 according to Paragraph (c) below and Division guidelines,
8 shall be disturbed by surface (underground) coal mining
9 activities"

10 And (c) is:

11 "A stream with a biological community shall be deter-
12 mined by the existence in the stream at any time of an assem-
13 blage of two or more species of arthropods or molluscan ani-
14 mals which are--

15 "(1) Adapted to flowing water . . .

16 "(2) Dependent upon flowing water . . .

17 "(3) Reproducing . . .

18 "(4) Longer than two millimeters at some stage in their
19 life cycle."

20 And as my report indicates, all four of those requirements
21 have been met. In fact, there are seven species of macroin-
22 vertebrates, authentic macroinvertebrates existing in the
23 stream. When I sampled, it was apparent that some of them
24 were multivoltling, which means they have many generations per
25 year. Some were univoltling, which means that they live in



1 the stream at least one year, which means there has to be
2 water there all the time.

3 So in accordance with that definition, I concluded that
4 the stream was perennial, at least at the point where it leaves
5 Mr. Crawford's property.

6 Q (By Mr. Olsen) Now, let me ask you--or you probably are
7 going to get into it--how does the application address the
8 perennial status of any streams on Peace Mountain or Mr.
9 Crawford's property?

10 A It doesn't acknowledge that there are any perennial
11 streams on the property. It just talks about surface seeps
12 and streams. It makes no mention that there is a perennial
13 stream associated in the South Fork of Grimes Wash, and their
14 mining plan does not take into account the potential buffer
15 zone as pointed in 817.57(a).

16 Q What's the impact of an absence of a buffer zone?

17 A It depends. If we're talking about the potential for
18 long-wall mining and the factors that we've talked about on
19 the subsequent removal of the potential spring sources here,
20 that means that due to subsidence and dewatering, you essen-
21 tially lose the stream, unless subsidence can be prevented in
22 the area or impact due to mining activities mitigated.

23 That pretty well takes care of 817.56.

24 I do have another set of data that I would like to intro-
25 duce, but it will come under a subsequent chapter on the



1 subsidence control program. It does deal with the flow of the
2 springs as we see them in their configurations, but it deals
3 more with the present mining activities adjacent to Mr.
4 Crawford's property. And so I think I'll talk about it then
5 rather than now.

6 MR. OLSEN: Let me ask, from what I can understand
7 on 817.57, page 196 of the regulations, that if there is a
8 perennial stream, there cannot be mining within 100 feet of
9 it unless Sections 817.43 or 817.44 are complied with, or unless
10 the Division specifically authorizes it pursuant to findings
11 (1) through the rest of that section. Has the Division so
12 found those requirements?

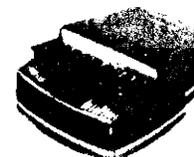
13 THE DIRECTOR: At this point I think, because we
14 realize the lead agency has been the Western Tech Center,
15 although you're working under this regulation, maybe it's a
16 little bit more appropriate that we address the question here.

17 MR. OLSEN: Can you answer that?

18 MR. TIEDT: Would you repeat the question?

19 MR. OLSEN: The question is, under Section 817.57,
20 the way I understand this, no mining can occur within 100 feet
21 of a perennial stream, unless Section 817.43 and 44 are com-
22 plied with, or unless the Division--and in this case, then,
23 maybe OSM--specifically finds certain things. Has such a find-
24 ing been made by the Division?

25 MR. TIEDT: I think the answer to that right now



1 is, of course, there haven't been any findings made. We are
2 in the process of making findings and reviewing documents, and
3 I think that your raising the question is one of the purposes
4 of this hearing, and that's something we will take a very close
5 look at.

6 MR. OLSEN: I was thinking, we will not even talk
7 about it if a finding has been made. And if it hasn't been
8 made, then of course, these become important.

9 MR. MOFFITT: I'm Jack Moffitt with the BLM, and we
10 deal with approving the mining part of these plans. I think
11 that's been interpreted, no mining is interpreted to mean for
12 underground mining, that there will be no subsidence occur
13 within this area. And mining is permitted on a somewhat re-
14 stricted basis in those areas with adequate safeguards to pro-
15 tect the surface.

16 MR. OLSEN: And I think those are the elements that
17 are addressed in 817.43 and 44. Or are they? Do you know?

18 A VOICE: No. That is diversion.

19 MR. OLSEN: Oh, that's right. That deals with how
20 they're going to fix it if they hurt.

21 Are those sections addressed in the application,
22 817.43 and 44?

23 THE WITNESS: I'm sorry. I skipped ahead here.

24 Q (By Mr. Olsen) Those are pages 181 through 183.

25 A 181 through 183?



1 Q Yes. Those are diversions on construction that have to
2 occur if the proposed damage--

3 A I think we didn't address this. I don't even know. I
4 don't know. They've done it for some of the other--like
5 Cottonwood Creek and Huntington Creek. But they haven't
6 addressed it on East Mountain, because they haven't addressed
7 there is a perennial stream there.

8 Q If they haven't recognized the presence of a perennial
9 stream, they haven't complied with 817.43 and 44?

10 A That's right. They have complied with it relative to the
11 streams that they have documented as being perennial, which
12 is Cottonwood Creek and Huntington Creek, but not South Fork
13 of Grimes Wash.

14 Q Go ahead.

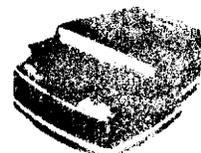
15 A If we can now move to the last section which I looked at
16 with Mr. Crawford, which would be 784.20, Subsidence Control
17 Plan, which is on page 90 of the regs--

18 Q What page was that?

19 A 90. All right. Section 784.20, Subsidence Control
20 Plan--it must have been written by--it's hard to go through,
21 sometimes; but it seems to me that what is required is a
22 survey.

23 "The application shall include a survey which shall show
24 whether structures exist."

25 And the application does show Mr. Crawford's



1 structure. So I think that's complied with.

2 The survey must also show whether renewable resource
3 lands exist. And I believe the application also recognizes
4 the presence of renewable resource lands on Mr. Crawford's
5 property. So those two are both complied with, and we're
6 happy that they have been, that being Section 4-41 of the
7 application.

8 Specifically, they acknowledge:

9 "Renewable resources present in the area--" Excuse me.
10 "It has been determined that there are renewable resources
11 present in the area in the forms of springs, water seeps,
12 grazing land, timber, and wildlife."

13 It doesn't recognize the presence of a perennial stream,
14 but certainly it does recognize the presence of renewable re-
15 sources, as required by 784.20, and we're delighted about
16 that.

17 Once their study recognizes the presence of those two
18 things, then they must also include, and this is again out of
19 Section 784.20: ". . . whether subsidence if it occurred
20 could cause material damage or diminution of reasonably fore-
21 seeable use of such structures or renewable resource lands."

22 So if they recognize they are present, which they do,
23 then they have to say in their study, "What's going to happen
24 to these things if subsidence does occur?" which subsidence
25 they also acknowledge is going to occur.



1 All right. So they've answered adequately and accurately
2 as to those things.

3 Section 784.20 goes on:

4 "In the event . . . that subsidence could cause material
5 damage or diminution of value or foreseeable use of the land
6 . . . the application shall include a subsidence control plan
7"

8 Q And the subsidence control plan is now what we need to
9 talk about, because it must contain the following information.
10 And it goes through from (a) through (c) and (d). So as to
11 the subsidence control plan, which must contain these elements,
12 Dr. Lamarra, do you want to address those issues?

13 A To begin with, they have to, in 784.20(b)(1) and (2),
14 they have to talk about detailed description of the measures
15 to be taken to prevent subsidence from causing material damage,
16 or lessen the value of reasonable foreseeable use of the sur-
17 face, which includes recreation, and for potential culinary
18 use of water, wildlife, et cetera.

19 And what they have to do essentially is give us the anti-
20 cipated effects of the planned subsidence, if there are any,
21 and then the measures, if any, to be taken in the mine to re-
22 duce the likelihood of subsidence, including several measures.

23 Basically, what they've done is that they have essen-
24 tially said that the anticipated measures to be taken is to
25 let it happen and hope for the best. And when you go through



1 this and you look through the document, that's basically what
2 the five pages from 4-41 through 4-45, 4-46, say. In essence,
3 they really don't--they acknowledge the fact that there are
4 renewable resources up there, but they make no mention of how
5 a subsidence program might prevent any loss of foreseeable use.
6 It's interesting to note that the applicant does propose to
7 leave sections of barrier pillars under a 345 KV transmission
8 line. And their comment is in here that the controlled sub-
9 sidence will not have a substantial effect on the surface.
10 And if that's the case, then why are they leaving pillars under
11 a transmission line, and not under Ted's property?

12 We perceive that the potential impact on the transmission
13 line is just as great, if not less than the potential impact
14 on the hydrologic balance of the property.

15 Q Where do those transmission lines run relative to the
16 property?

17 A I don't know. I think they're over--

18 MR. CRAWFORD: Straight north.

19 MR. JERMAN: Weren't they on the Deer Creek, and not
20 the Wilberg?

21 THE WITNESS: That's right. But my understanding
22 is that the two mining plans and the reclamation plans are
23 interchangeable. And I think the comment was made that we can
24 address to a certain extent both issues.

25 Q (By Mr. Olsen) As to the Deer Creek Mine, the proposal



1 was to leave the pillars underneath their transmission lines,
2 but as to the Wilberg application, don't worry about any
3 pillars underneath the streams and springs?

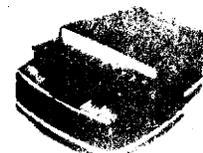
4 A That's right.

5 THE DIRECTOR: Do you have any other information--
6 I realize you're not an engineer--but other information that
7 would suggest that there are characteristics that are differ-
8 ent in the case of the Deer Creek and where the power
9 transmission lines are that make it distinct from Mr. Crawford's
10 property?

11 MR. CRAWFORD: Well, they could probably tell you
12 exactly.

13 Q (By Mr. Olsen) Yes. And I think we do. And I think
14 that's one of the things that Dr. Lamarra is going to get into.
15 Now, I'm not sure whether the information we have demonstrates
16 the depth of overburden over the Deer Creek versus the Wilberg.
17 But I think it does. And I think that it will show that there
18 is significantly less overburden, I think to the tune of about
19 800 feet over Mr. Crawford's property than over the under-
20 ground that was tested for the subsidence. In other words,
21 the effect of subsidence at a 1200 to 2400 foot overburden
22 depth is significantly less than the effect of subsidence with
23 800 feet less overburden.

24 A I can probably address that. In their mining applica-
25 tion, in Figure 3, for I think it's just before page 4-45, they



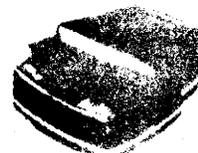
1 describe in detail the lines of equal subsidence that might
2 be affected by taking a panel out with a long-wall machine.

3 And I think it's interesting to note that throughout this
4 document they continually refer to overburdens of upwards of
5 2400 feet. And in looking at these lines of equal subsidence,
6 you will notice that the more overburden that you stack on
7 top of a particular seam of coal being removed by a panel
8 removal, the less surface subsidence occurs.

9 **Nowhere** do they talk about the projected impacts that
10 might occur in an area 800 feet to 1,000 feet less overburden.
11 In other words, commonly when I've reviewed other mining plans,
12 they talk about a worse case engineering scenario. **Nowhere**
13 in the document do we have a worse case scenario. It's
14 always more or less a best case.

15 Now, the other thing that I think is a misrepresentation,
16 in this particular figure, is that throughout the mining plan
17 they talk about removing an eight-foot seam of coal upwards
18 of 600 feet long or wide; and in this particular diagram,
19 we're dealing with a five-foot seam of coal 500 feet wide.
20 And so these lines of intensity or surface subsidence will
21 change somewhat.

22 The other omission here is that in looking at the documents
23 that have been filed with the Office of Surface Mining by
24 Utah Power & Light, they talk--they have a bunch more detailed
25 subsidence evaluation that I feel ought to be included as an



1 appendix to this mining plan.

2 And it is Subsidence Projections, East Mountain Area,
3 Emery County, December 3, 1977, by Dan Baker, Senior Mining
4 Engineer, Utah Power & Light. And this was given to the
5 Geological Survey. And when you look at that document, they
6 talk about surface subsidence up to six feet in the area.
7 And so in the document that we have before us here, the
8 maximum subsidence they talk about is 2.6 feet. Yes.

9 MS. BOUCEK: Would you like to enter this?

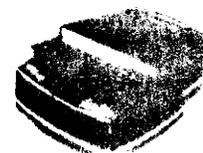
10 THE WITNESS: I think the Office of Surface Mining
11 already has a copy of it.

12 MR. OLSEN: Yes. I think by reference certainly we
13 would.

14 MR. SHINGLETON: It's on file. All agencies have
15 that document.

16 THE WITNESS: The other point I would like to make
17 is that they do have to provide a monitoring program, and I
18 have reviewed their subsidence monitoring programs, and I
19 would like to commend Utah Power & Light on the information
20 provided in these subsidence monitorings. I think it's an
21 excellent classic example of documenting subsidence and the
22 use of long-wall mining.

23 However, I do disagree with the fact that they can
24 use the present model that they are using to project impacts
25 over the whole mining area primarily because the sites that



1 they have selected for this photographic subsidence model
2 that they are proposing in page 4-46 is, as I said before,
3 maximum overburden, fairly flat topography, and there are
4 no springs present in the area.

5 So, naturally, any subsidence is not going to impact any
6 surface water seeps, and the groundwater cannot be--water
7 changes cannot be documented. So even though it is an excel-
8 lent initial step, I would recommend that it be taken further
9 into more complex areas of topographic features in order to
10 try to make some extrapolations to the effect of surface
11 topography and less overburden and its potential impact on the
12 groundwater.

13 Q (By Mr. Olsen) I think what you're saying there--correct
14 me if I'm wrong--is the subsidence information provided in the
15 application describes what may happen in an area which has
16 significantly more overburden than the area that we're dealing
17 with?

18 A That's right.

19 Q And it is an area wherein there are no springs. And so,
20 naturally, surface water isn't affected. And what you're ask-
21 ing to occur is an analysis by OSM or by the Division as to
22 what would occur with the subsidence information provided in
23 1976, which acknowledges at least an--or, up to a six-foot
24 subsidence to occur where there is significantly less over-
25 burden with the presence of springs, because the application



1 just doesn't even talk about that?

2 A That's right. So it's--it's essentially a monitoring pro-
3 gram that I think needs to be evaluated and correlations drawn
4 to potential impacts, because we feel that once the streams
5 are dewatered, the damage has been done. We do not perceive
6 that based on the length--based on the interbedding of poten-
7 tial clays in the area--that that's going to solve the problem.

8 The other comment is that if we look at the application--
9 and it talks about the actual--where are we at?--subsidence
10 damage prevention measures, which is the next subsection--

11 THE DIRECTOR: Excuse me. Could you give us the
12 subsection or page?

13 THE WITNESS: We're still on 784.20, Control Plan.
14 And within that they have to provide, (b): "A detailed des-
15 cription of the measures to be taken to prevent subsidence."

16 And what I'm essentially saying is that--they have
17 essentially said that they're going to use the long-wall mining
18 technique. They're going to allow subsidence to occur, and
19 because of the controlled ability of the subsidence program
20 that there--that that will essentially prevent any potential
21 damages.

22 Q (By Mr. Olsen) Do you agree with that?

23 A No. Okay. As far as the mitigation of subsidence dam-
24 age effects, as we talked about before, that the renewal--
25 the foreseeable uses of the surface would include aesthetic,



1 wildlife, et cetera. Nowhere in the mining plan does it
2 talk about the mitigation of subsidence damage effects.

3 Now, in 1981, the information generated by Mr. Danielson
4 went back to his report, because he was the first one to very
5 accurately define the water patterns existing on East Mountain.
6 Based on that initial analysis, I essentially came to pretty
7 much the same conclusion that Utah Power & Light came to, from
8 a different direction; and that is that they talked about the--
9 excuse me just a second here--they talked about the ability
10 of the springs to recharge themselves annually.

11 And I totally agree with that. And their analysis con-
12 ducted in 1981, published in 1982, gives an analysis of where
13 they compare the average precipitation for three years, 1980,
14 1981, 1982, actually four data points, and they plot the dis-
15 charge of the springs on East Mountain versus average precipi-
16 tation for three different sites.

17 I looked at that, and, being a scientist, I thought that
18 was somewhat interesting. What I did is essentially take a
19 little bit more defined look at that particular situation.
20 And this is the information--and I would like to admit this--
21 this is the information from Danielson's report--

22 MR. OLSEN: Let's describe that as Exhibit H.

23 (Exhibit H was marked for
24 identification.)

25 THE WITNESS: What Danielson did is he went down to
the springs on East Mountain. I think he identified 140



1 springs, four of which are still being sampled by Utah Power
2 & Light on Mr. Crawford's property. What we're looking at
3 here is what he called a recession discharge curve. And what
4 he did is he plotted at four different times through the
5 summer starting in July, he plotted the--he plotted the log
6 of discharge versus time. And what he came up with is a curve
7 that looks something like this (drawing).

8 And he said that--this is in essence the early
9 spring. July is the highest flows, because you've had winter
10 precipitation. As he noted, 98 percent of the amount of water
11 in these springs is coming from snow and rain.

12 He followed the discharge pattern. What he found
13 is that the two years he did the study that the initial value
14 was different; but these curves showed--had the same shape.
15 And what he was proposing is that this phenomenon could be used
16 as a monitoring tool, so you could look to see if the recharge
17 area of the springs was disrupted by mining activities. Simply
18 by defining the base condition of the springs, that would
19 change from year to year.

20 Well, in essence, what he was really defining is the
21 characteristics of these springs. And what I did is went back
22 and looked at springs that were in the North Horn Formation
23 on Ted's property.

24 Now, remember, these are the ones that are recharged
25 during the early spring, and the Price River Formation, which



1 is some 800 feet below this. And I looked at these, and I
2 found recession discharge curves, which are pretty much the
3 same pattern, sort of an exponential decay over time, indi-
4 cating that, yes, they do recharge in the spring, and they
5 discharge through the summer. And these are the data for
6 Burnt Tree Springs and Springs 79-2, which are the upper
7 springs in the North Horn Formation, and then Spring 84-44 and
8 Spring 80-45. Those are Utah Power and Light's monitoring
9 numbers, and they are in the lower Price River Formation.

10 Okay. Now, if that's the case--and we make the con-
11 tention that these things recharge each year. Then we would
12 expect all four springs to display the same seasonal pattern
13 that Utah Power & Light described in their monitoring pro-
14 gram for the sum of all the springs on East Mountain.

15 And I would like to show you the data for the springs
16 on the North Horn Formation, on the north side of East
17 Mountain, on the south side of East Mountain, and then the
18 springs for the Price River Formation, which are down here.

19 THE DIRECTOR: Now, is this information from--

20 THE WITNESS: Utah Power & Light. This is a
21 reanalysis of their data generated in Table--what's the one
22 marked in red there?

23 THE DIRECTOR: Table 19.

24 THE WITNESS: Yes. This is data that's been gener-
25 ated from Table 19. What they essentially did to generate



1 their curve was to sum all of the springs on East Mountain
2 together to get one flow value for forty some odd springs.
3 And what I've done is simply to take and break out the springs
4 by location. And what we found is this is--this is years here,
5 1979, '80, '81, and '82. And this is precipitation, or dis-
6 charge. And the precipitation goes like this.

7 And these are just arbitrary numbers. It goes up,
8 and in 1981 it goes way down. And then it goes back up.
9 And so the precipitation does this.

10 What we find for the North Horn Formations on the
11 north side and on the south side, we find that they essentially
12 do the same thing. They do this.

13 Q (By Mr. Olsen) To understand that, you're saying those
14 upper springs do follow an annual precipitation flow pattern?

15 A Exactly.

16 Q And that's what Utah Power says, and we agree with that
17 as to the upper springs on Mr. Crawford's property?

18 A Right. And they would expect the lower springs to follow
19 the same pattern, because Danielson's discharge recession
20 curves indicate that they are being recharged annually, having
21 a maximum flow in the spring.

22 What we found is that using Danielson's data of a value
23 up here--now, these are the springs that are coming out under-
24 neath an area where mining, long-wall mining is presently
25 occurring. In other words, this is a lower formation.



1 Long-wall mining is occurring adjacent to Ted's property,
2 immediately above or adjacent to some of these spring areas.

3 Okay. And what we are finding is that 1979, 1980, data
4 looks like this. And then 1981 looks like this. Aha! It's
5 doing exactly the same thing. But 1982 is down here.

6 And so what we are essentially saying is that, again,
7 based on available information that the springs in the lower
8 Price River Formation which should be recharging have steadily
9 gone down with the start of long-wall mining adjacent to the
10 property.

11 Q Now, that impact, it is measured as of 1980 to date?

12 A That's right.

13 Q What about 1983 data?

14 A We don't have any data available for 1983. In all pro-
15 bability, these could go up, they could stay the same, they
16 could continue to go down. We don't know. But we feel that
17 right now we have sufficient concern that this reduction in
18 the spring flow in 1982 may lead us to believe that there may
19 be some mining activities. It is of concern to us.

20 MS. BOUCEK: Dr. Lamarra, for my own edification,
21 if the '83 data yielded an increase over '81 or '82, an
22 increase in discharge of those lower springs, would you be in-
23 clined to possibly conclude that there is a lag time in the
24 recharge for those springs in the lower strata?

25 THE WITNESS: Yes. Could be. Could be. Could



1 very well be. And, in fact, that might be a very viable
2 explanation for the decrease here. But I--and this is--you
3 know, there are several possible hypotheses that one could
4 generate for this reduction. We cannot definitely say it is
5 resulting from mining activity.

6 And I would not state that that is the case. But
7 there is enough sufficient concern that there is a decrease
8 here relative to the fact that these springs should be re-
9 charging. And they did not demonstrate that recharge reces-
10 sion curve that Danielson points out.

11 Yes, and in fact, I hope they do go back up. But
12 my concern is that they have gone down. I address the issue,
13 and let's wait for the '83 data and hope for the best.

14 THE DIRECTOR: Is this going to be an exhibit?

15 MR. OLSEN: Yes. It should be Exhibit I.

16 (Exhibit I was marked for
17 identification.)

18 MR. OLSEN: It's noon, and I suspect people are get-
19 ting hungry. I don't know what you want to do.

20 THE DIRECTOR: Yes. I would suggest at this point,
21 if there are questions specifically for Dr. Lamarra at this
22 time that anyone would like to address, that we could handle
23 those while the subject is fresh, and maybe we could reconvene
24 in an hour or so. Are there any questions at this point?

25 MR. JERMAN: I have a couple to ask. You say you
want to go ahead with those now?

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THE DIRECTOR: Yes.

EXAMINATION BY MR. JERMAN

Q Dr. Lamarra, on the drawing in the upper right-hand corner, what does the term F-l-a-g stand for?

A Flagstaff Limestone.

Q I thought you indicated earlier it was a shale.

A Limestone.

Q You also seemed to imply swelling clays existed only in the Price River Formation, and not the North Horn or the Blackhawk Formation?

A I agree that there are lenticulated sands and interbedding of clays in both formations. My comment is that they are restricted on the upper levels of the Price River Formation.

MR. OLSEN: Where did you get that data? Why don't you think there are any sealing clays below the Price River Formation?

THE WITNESS: I obtained that from a drill log published by Utah Power & Light in their 1977 assessment to OSM.

Q (By Mr. Jerman) You referred several times to Danielson's report. Could you identify that?

A Yes, the Danielson report is "Hydrology of the Coal-Resource Areas in the Upper Drainages of Huntington and Cottonwood Creeks, Central Utah, U.S. Geological Survey, Water-Resources Investigations, Open-File Report 81-539." Published 1981.

Q I believe you testified you were retained by Mr. Crawford



1 in 1981 as a consultant; is that correct?

2 A Yes.

3 Q Have you appeared as a consultant in any other matters
4 relating to coal mining?

5 A Have I appeared as a consultant?

6 Q Or as a witness? Have you done consulting work?

7 A Oh, yes.

8 Q Where would that be?

9 A That was for the P & M Coal Mine, Kemmerer, Wyoming.

10 Q Do you have any interest in the property that Mr. Crawford
11 owns, the 300 acres he's testified about?

12 A What do you mean?

13 Q Do you own anything?

14 A I'm related to him, yes.

15 Q What relation?

16 A I'm his brother-in-law.

17 Q I see.

18 MR. OLSEN: Do you own any?

19 THE WITNESS: No. No.

20 MR. OLSEN: That's what you were asking?

21 MR. JERMAN: Yes.

22 Q (By Mr. Jerman) Does he own any of the ground? Does he
23 have an interest in it or a cabin lot there?

24 A I don't have a cabin, no.

25 Q A lot?



1 A No. I don't have a lot either.

2 Q You're Mr. Crawford's brother-in-law?

3 A Yes. I would like to stress the point that I pride myself
4 in being objective and being a professional.

5 Q I'm sure you are.

6 A Let me finish. And that I feel that if I was hired by
7 Utah Power & Light, I would have given you exactly the same
8 assessment as I've given to Mr. Ted Crawford.

9 MR. OLSEN: Son-in-law?

10 THE WITNESS: Son-in-law. I mean, I have to go home,
11 you know.

12 Q (By Mr. Jerman) You're saying you're a son-in-law, not
13 brother-in-law?

14 A Brother-in-law, yes.

15 MS. BOUCEK: Son-in-law.

16 THE WITNESS: I'm an in-law. That's what I meant.
17 I have to go home. So--

18 MR. JERMAN: That's all I have.

19 THE DIRECTOR: Are there any other questions?

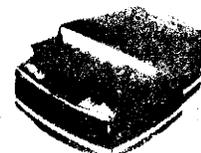
20 Mr. Olsen, do you have additional information that you would
21 like to present?

22 MR. OLSEN: Yes, we do. It probably won't be as
23 lengthy as what we've presented, but we would like to recon-
24 vene.

25 THE DIRECTOR: All right.



1 MR. JERMAN: We have a commitment that might make
2 an hour a little short. Could we make it an hour and a half?
3 THE DIRECTOR: All right.
4 MR. OLSEN: That's fine with us.
5 THE DIRECTOR: Excuse me. Why don't we go off the
6 record.
7 (Discussion off the record.)
8 Let's go back on the record. Is there any problem
9 with convening at 1:30 for anyone? All right. Why don't we
10 plan to reconvene here at 1:30, then.
11 (Noon recess from 12:05 p.m. until 1:30 p.m.)
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1 SALT LAKE CITY, UTAH, THURSDAY, MARCH 29, 1984, 1:30 P.M.

2 * * * *

3 THE DIRECTOR: I think we'll start now. This is the
4 continuation of the informal conference to provide information
5 on the mining and reclamation plan for Utah Power & Light's
6 Wilberg Mine in Emery County, Utah.

7 Mr. Olsen, did you have additional information to
8 present to the conference?

9 MR. OLSEN: Yes, we do. I think that we've covered
10 most of what we hoped to; but Dr. Lamarra has two or three
11 additional points that he would like to raise. So I'll just
12 turn the time over to him and let him get into it.

13 THE WITNESS: I've only got one more section I'd
14 like to go through, and that has to do with the protection of
15 fish, wildlife, and related environmental values, UMC 817.97,
16 page 218. It's page 4-5, Volume 4.

17 The regulations speak about using best technology
18 currently available to minimize disturbances and adverse im-
19 pacts of the activities on fish, wildlife, and related enviro-
20 nmental values, and achieve enhancement of such resources
21 where practicable.

22 In looking at the mining plan, one of our major
23 concerns is that they talk about the riparian communities,
24 which we are also defining as the stream bank vegetation
25 associated with the perennial stream on Grimes Wash, as well



1 as the riparian meadows that exist in and around the springs.

2 They make the comment in the first paragraph of
3 their application that riparian communities, though sparse,
4 shall remain in the present condition. And I hope that we
5 sort of address that in an indirect way, talking about the
6 rather diffuse nature of the groundwater out there, and that
7 if it is disturbed we might lose these riparian communities.

8 That is a concern of ours, that as far as the
9 aquifers are concerned and the groundwater discharge in pro-
10 tecting that in order to enhance fish and wildlife--

11 EXAMINATION BY MR. OLSEN

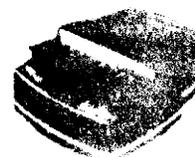
12 Q Vince, can I make a point here? If I understand it, that
13 statement in the application discusses the generally sparse
14 nature of the terrestrial community; is that right?

15 A Specifically, the riparian community.

16 Q Yes. The riparian.

17 And I think that for a large section of the application
18 area, that may be true; but for the specific area that we're
19 dealing with, the East Mountain area, and Mr. Crawford's land,
20 that is decidedly not the case, because of the presence of the
21 eight springs, perennial spring and perennial pond. I think
22 that the application is accurate to the extent of speaking of
23 the entire area; but to our particular area it doesn't address
24 and focus on what we're trying to make.

25 A They do--the Act also does provide for mitigation of



1 best available technology, and again they address the surface
2 water issue, as one might expect, and rightfully so. They make
3 the comment in the subsection of that paragraph, "Surface
4 waters--" Well, back up. It says:

5 "Information obtained from current state of the arts
6 subsidence technology indicates that surface waters will not
7 be detrimentally affected by mining activities. However, it
8 is accepted that the potential for disturbance does exist.
9 Therefore, mitigation measures will be initiated if disturbance
10 does occur. Surface waters will be replaced or repaired by
11 the following methods: (1) Streams will be bridged across
12 bedrock fractures by culverts until sediments fill the creek;
13 and (2) Springs and seeps, flows, lost to subsidence action
14 will be replaced by guzzlers."

15 And a guzzler simply is lining a drainage channel, an
16 ephemeral drainage channel with plastic and allowing it to
17 fill with water, similar to some of the ephemeral ponds that
18 we see on the property now.

19 It says: "These methods require little maintenance and
20 will provide a semipermanent surface water problems
21 that can be attributed to subsidence and liability determined
22 by the courts."

23 And I guess we feel that that's, you know, not really a
24 viable alternative to mitigation for the potential loss of the
25 waters up there. We don't have an alternative at this point



1 in time, but there really is no comparison between drinking
2 out of an ephemeral pond and drinking out of a perennial spring,
3 which is what the purpose of the water sources will be used
4 for hopefully in the future as a foreseeable use.

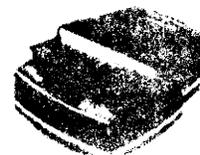
5 MS. BUCEK: Excuse me. By drinking out of that, do
6 you mean human consumption or wildlife?

7 THE WITNESS: Yes. No, human consumption. That's
8 pretty much--otherwise, I think that the protection for fish
9 and wildlife is adequately addressed other than those particu-
10 lar issues; and, as noted in the application, the Division of
11 Wildlife Resources, State of Utah, also stated that essentially
12 that was adequate.

13 Again, the omission is that they do not recognize
14 the perennial stream on East Mountain and the associated habi-
15 tats with that.

16 I should point out that because of the large area
17 involved and the techniques used for the wildlife and fish in-
18 ventory, it is not inconceivable that they could miss a three
19 or four hundred acre spot. You know, the application is 5,000
20 acres or so. They only had--they intentionally surveyed it
21 with air photos and subsequently ground-truthed it at five or
22 six locations. So it is conceivable that they missed, you
23 know, Ted Crawford's property in Grimes Wash.

24 If they had found it, I'm sure that they would have,
25 you know, observed those environmental conditions. It just



1 was a--you know, by chance they missed it, I suspect.

2 The final comment that I would like to make is one
3 of--I'm not a geologist, but the mining application did raise
4 some concerns that I would like to see Utah Power & Light
5 address, or the Office of Surface Mining, or the State of
6 Utah. And I felt personally that the subsidence--the descrip-
7 tion of the subsidence on East Mountain to be perfectly honest,
8 rather simplistic; and it's obviously a lot more complex prob-
9 lem than that. I think that as far as the application is
10 concerned and the appendix to the application, I would like
11 to see much more detailed state of the art engineering
12 scenarios, primarily worst case-best case.

13 I feel that at a minimum that should be in the
14 application.

15 My primary concern exists in comparing what is in
16 the application, primarily Figure 3 to the subsidence projec-
17 tions, East Mountain Area, dated December 30, '77, received
18 by the USGS in Salt Lake City by Dan Baker, which I thought
19 to be a rather nice, elegant description of the subsidence
20 potential on East Mountain.

21 And, you know, things like looking at the postulated
22 limit angles based on mythology really give some insights as
23 to what the potential could be for the area below East
24 Mountain, primarily with only 800 to 1200 feet of subsidence.

25 And I just feel that sort of an injustice was done



1 in that section, and maybe an oversimplification to make it
2 more readable by the general populace. But I felt that there
3 ought to be something in more detail put in there, so that
4 technical people could read it and understand it in more
5 detail.

6 And that's why I would strongly suggest to Utah
7 Power & Light that they maybe in their amended application in-
8 clude the subsidence projections if at all possible.

9 The other thing is that in looking at their postu-
10 lated limit angle, primarily for the Price River Formation and
11 the Castlegate Sandstone, which is below it, which does inter-
12 sect the surface in this area, they're talking about a limit
13 angle of 90 degrees, which really indicates almost a fracture
14 plane. And my concern is that there have been other studies
15 done in the Book Cliff Area, primarily the one done by the
16 Department of the Interior, Geological Survey, Professional
17 Paper of 969, some geologic engineering factors controlling
18 coal mine subsidence in Utah and Colorado.

19 And this talks about similar depths of overburden
20 and in sandstone similar to what we have in the bed of Grimes
21 Wash.

22 They show some fairly major surface features,
23 fracture planes, and the like. And I'd just like somebody
24 with a little more expertise to address those issues relative
25 to the specific area that we see on the Grimes Wash situation.

overburden



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That's all I've got.

MR. OLSEN: Thank you.

THE DIRECTOR: Are there any other questions?

All right.

MR. OLSEN: Did you have anything else?

MR. CRAWFORD: No.

MR. OLSEN: If there are no further questions, I had some closing thoughts I wanted to propose, if they're appropriate, if now is the time.

THE DIRECTOR: I think this would be the time.

MR. OLSEN: Recognizing the tendency to drift on into sleep after a noon meal, I'll try and keep them short.

At the beginning of the presentation today, I suggested that we thought there were some areas in the application that simply didn't exist that needed to; and from what we've heard and from what we were able to discern from a review of the application, those areas are UMC 784.14(c); 784.14(a)(2); 817.57(a); 784.20(c); and 817.97. I also indicated that we perceived there were deficiencies in the data that was provided, and we perceived those deficiencies, inadequacies, to be 784.14(a)(1), (2), and (3); 817.41(a) and (b); 784.20(b)(1) and (2); and 784.21.

MS. BOUCEK: Excuse me for just a minute. That last one was 784.21? That's the first time in the context of this discussion that that regulation has been mentioned. Is that



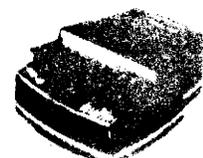
1 the one?

2 MR. OLSEN: Yes.

3 MS. BOUCEK: That is another one, too, that has
4 been remanded.

5 MR. OLSEN: The regulations provide that there be
6 mitigating or preventive measures to prevent subsidence; and
7 one of those specifically allowed is room and pillar mining,
8 and we have no objection if we have room and pillar mining
9 resubstituted for the proposal underneath this property, be-
10 cause that would mitigate, we think, the impact of subsidence.
11 But that's not proposed, and the failure to propose that is
12 one of our great concerns, because the subsidence will be--
13 the mitigation, as I understand the application, the mitiga-
14 tive efforts proposed are simply to have planned subsidence.
15 Given what we perceive to be the fragile nature of the area,
16 the planned subsidence could be disastrous and, therefore,
17 destroy the aquifers, the groundwater system, and the surface
18 water makes this area so attractive for what we perceive to
19 be recreational use as a reasonably foreseeable use and to
20 destroy the renewable resource feature of the property.

21 The Utah Power & Light has suggested and has proposed
22 to some extent some very good monitored program, some not so
23 good. But that's not really the solution that is going to
24 address our concern. That's like giving us an hour by hour
25 update of how the patient is dying.



1 It doesn't provide the injection of the lifesaving
2 drug, and that's what we're trying to provide. The solutions
3 they suggest, if they do hurt us, are to pipe the water from
4 over the mountain or from other springs. But the applica-
5 tion doesn't address whether they have the water rights in
6 the area to do that, and for how long they would propose to
7 pipe that.

8 In one sense, they suggest, "We'll do it until these
9 heal themselves." That would be great if we're talking two
10 years or three years; but if we're talking geologic time, in
11 ten thousand years, that's an awful lot of pumping of an awful
12 lot of water to replenish both the surface loss and the ground-
13 water loss.

14 Rube Goldberg comes to mind. when I think of the
15 practicability of that solution. They propose to replace the
16 springs with the guzzlers. Stagnant water ponds would then
17 be created. I think there is a significant difference of
18 qualitative use of the water if the springs are destroyed by
19 replacing them with guzzlers.

20 It's a significant impact. And to culvert the
21 water, if they do create a failure, just culvert across it un-
22 til sometime in the future, when that may heal itself, those
23 are solutions that we just think are not reasonable, not
24 practicable, not the real world.

25 The final solution that Utah Power proposes, if they



1 hurt us in this regard, is sue us, litigate, take us to
2 court. And that's provided for in the application. And
3 that is not, I think, an acceptable solution to the mitigative
4 efforts that they are required to provide.

5 It concerns me personally that the appearance of the
6 application, 1983 and 1984, containing information which seems
7 to be less adequate than the information that was available
8 and published by Utah Power in 1977, and I don't know why
9 that is.

10 I'm sure that they have a good explanation, but it
11 doesn't appear in the application, and that's a concern that
12 I have.

13 786.19 is the final thing that I'd like to address,
14 the Criteria For Permit Approval Or Denial. I'm sure you
15 know them all very well, and maybe there is a state of the
16 art understanding of these that is different than mine. I
17 certainly would concede that. It's on page 116. As I read
18 it, it says that--and I'll read what I think is the pertinent
19 language:

20 "No permit . . . shall be approved unless the appli-
21 cation affirmatively demonstrates . . . that the application
22 is accurate and complete and that all requirements of the
23 Act . . . have been complied with."

24 Now, I think that a fair reading of the application
25 shows that hasn't occurred; and, therefore, the permit can't



1 be approved until it does occur.

2 Finally, it says:

3 "The assessment of the probably cumulative impacts
4 of . . . mining . . . on the hydrologic balance . . . has been
5 made . . . and the operations . . . to prevent damage to the
6 hydrologic balance occur."

7 So when you look at what the requirements, the
8 criteria, are versus what the reality of the application is,
9 I think they've got a long way to go.

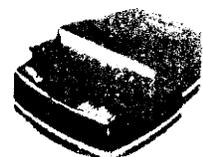
10 So maybe if we had a lot of information that was pro-
11 vided to us, our opinion would change; but at this point I
12 don't see any possibility, any real basis for a permit approval
13 of the application as it stands.

14 That's all I have.

15 THE DIRECTOR: Are there any other additional ques-
16 tions or comments?

17 MR. JERMAN: I have just one statement to make. As
18 you know, I'm Ralph Jerman representing Utah Power & Light.
19 We have some very serious questions and concerns about much
20 of the testimony that's been presented today. We think it
21 demonstrates a big deal misunderstandings, misconceptions,
22 and there even have been some misrepresentations.

23 But we also have concerns about the qualifications
24 of Mr. Crawford's principal witness that testified and some
25 of the areas that he's testified to. I'm sure that Dr. Lamarra



1 is an excellent limnologist, and I understand he's a very good
2 teacher; but much of what he's talked about today relates to
3 geology, mining engineering, hydrology. I don't think he's
4 quite qualified to discuss some of that.

5 But I understand we will have an opportunity to
6 respond adequately to any questions that the Division might
7 have or OSM might have; and, thus, to keep from prolonging
8 this hearing today, we will take that opportunity.

9 That's basically all we have to say.

10 THE DIRECTOR: Is it acceptable to OSM that written
11 response and comments on any of the information that was
12 brought up today could be forwarded to your office? And do
13 you want to set a deadline or some timetable within which you
14 receive that information?

15 MR. TIEDT: I think the purpose was to obtain infor-
16 mation as to where they felt there were concerns and what
17 their specific concerns were. I think in the reviewing of the
18 application, these comments will all be considered, and things
19 will be looked at.

20 In any place where the agency agrees with the people
21 here, why, they will probably be asking questions of the
22 company. If they disagree, they will be doing that in their
23 review as to specific reasons.

24 I think that a timetable would be inappropriate.
25 We would just proceed with processing the mine plan.



1 THE DIRECTOR: I guess I judge from what Mr. Jerman
2 is saying that he would like to have an opportunity to speci-
3 fically answer some of the--

4 MR. JERMAN: If they have questions, I assume they
5 will get back to us with some of those questions.

6 THE DIRECTOR: Is that suitable?

7 MR. JERMAN: Yes.

8 THE DIRECTOR: Yes. Mr. Crawford.

9 MR. CRAWFORD: I was wondering if the OSM could give
10 us a timetable for the mining claim.

11 MR. OLSEN: And, additionally, I'm wondering, can
12 Utah Power & Light give us any indication as to when the 1983
13 monitoring data will be available?

14 MR. JERMAN: Let me check.

15 MR. OLSEN: I'm not sure. I mean that's pretty
16 critical, too, to some of the things you've got to look at.

17 MR. SHINGLETON: It will be within two weeks.

18 MR. CRAWFORD: Is that both subsidence and water?

19 MR. JERMAN: No. Water is all we're talking about.

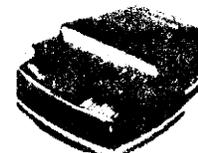
20 MR. CRAWFORD: There is supposed to be one on sub-
21 sidence, too.

22 MR. OLSEN: So, two weeks?

23 MR. SHINGLETON: We plan two weeks.

24 MR. JENSE: Within the next month.

25 MR. OLSEN: On just the water monitoring damage?



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(Mr. Jense nods head.)

THE DIRECTOR: Are there any other questions or comments?

MR. GRIMES: Ben Grimes representing another coal mining company. We are interested in the proceedings of this thing, and we ask the question, how can we be kept informed on the findings of this? Is that possible?

THE DIRECTOR: In terms of OSM's findings relative to their consideration of these comments, it would be available, as I understand them, when the final T.A. is made available?

MR. MANGER: Right.

THE DIRECTOR: Short of that, I'm not aware of a more formal procedure. Everything up to that point in terms of-- your documentation is going to be essentially in-house working documents.

MR. MANGER: Right.

THE DIRECTOR: And so I think the next formal manner for obtaining that information would be at release of final T.A. Certainly I'm sure Mr. Olsen would be happy to try and answer any questions that you might have from time to time, and I would suspect that Utah Power & Light would be willing to do the same. But as far as I know, that's the only formal mechanism we have of doing that.

Any other questions? All right. We'll consider the conference adjourned, and thank you all very much.

(At 2:05 p.m. the hearing ended.)



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C E R T I F I C A T E

State of Utah)
) ss
County of Salt Lake)

I, Ronald F. Hubbard, do hereby certify that I am a certified shorthand reporter in and for the State of Utah; that I reported in shorthand the foregoing proceedings; that that this transcript is a full, true, and correct record of said proceedings.

Dated at Salt Lake City, Utah, this 2nd day of April, 1984.

Ronald F. Hubbard
Ronald F. Hubbard
Certified Shorthand Reporter
License No. 32





STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dianne R. Nielson, Ph.D., Division Director

4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

March 16, 1984

Newspaper Agency Corporation
Legal Advertising
P.O. Box 838
Salt Lake City, Utah 84110

Gentlemen:

SUBJECT: NOTICE OF INFORMAL CONFERENCE

Attached is Notice of Hearing, before the Division of Oil, Gas and Mining, Department of Natural Resources, State of Utah.

It is requested that this notice be published ONCE ONLY, as soon as possible, but no later than the 25th day of March, 1984. In the event that said notices cannot be published by this date, please notify me immediately by calling 533-5771.

Upon completion of this request, please send proof of publication and statement of cost to the Division of Oil, Gas and Mining, 4241 State Office Building, Salt Lake City, Utah, 84114.

Sincerely,

A handwritten signature in cursive script that reads "Marjorie L. Larson".

Marjorie L. Larson
Administrative Assistant

Attachment
43570



STATE OF UTAH
NATURAL RESOURCES
Oil, Gas & Mining

Scott M. Matheson, Governor
Temple A. Reynolds, Executive Director
Dianne R. Nielson, Ph.D., Division Director

4241 State Office Building • Salt Lake City, UT 84114 • 801-533-5771

March 16, 1984

Emery County Progress
Legal Advertising
P.O. Box 589
Castle Dale, Utah 84513

Gentlemen:

SUBJECT: NOTICE OF INFORMAL CONFERENCE

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Sincerely,

A handwritten signature in cursive script that reads "Marjorie L. Larson".

Marjorie L. Larson
Administrative Assistant

Attachment
43570

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
IN AND FOR THE STATE OF UTAH

---ooOoo---

IN THE MATTER OF THE MINING AND RECLAMATION PLAN, UTAH POWER & LIGHT COMPANY, WILBERG COAL MINE, ACT/015/018, EMERY COUNTY, UTAH : NOTICE OF INFORMAL CONFERENCE
:

---ooOoo---

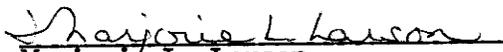
THE STATE OF UTAH TO ALL INTERESTED PARTIES IN THE ABOVE ENTITLED MATTER.

Notice is hereby given that the Division of Oil, Gas and Mining, State of Utah, will conduct an informal conference on Thursday, March 29, 1984, at 10:00 a.m. in the joint conference room of the Division of Oil, Gas and Mining, 4241 State Office Building, Salt Lake City, Utah. The mining and reclamation plan application for the Wilberg Mine shall be discussed at that time.

Any interested firm, person or corporation shall be entitled to appear at the time and place aforesaid to be heard by the Division. The Application may be inspected in the office of the undersigned, 4241 State Office Building, Salt Lake City, Utah.

DATED this 16th day of March, 1984.

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING


Marjorie L. Larson
Administrative Assistant

March 29, 1984
Informal Conference, Utah Power & Light,
Wilberg Mine
Attendee list

Mary Boucek, DOGM

BOB GRIMES, PLATEAU MINING

Mal Conrad, E.I.S.

JERRY Taylor, UP&L

Jerry Hernandez, BLM

Jack Moffitt, BLM

Tom Suchoski, FORD, BACON, & DAVIS

Jody Williams UP&L

Carly Burton UP&L

Rodger Fry Utah Power & Light

Tom MUNSON DOGM

Tom Telling DOGM

John Whitehead DOGM

Donald Inbraugh-Littig DOGM

Ray James - Utah P. & L. Co.

Ray W. Jung Utah P. & L. Co.

Chris Singleton "

Everett Hoyer DOGM

DL BRYNER UP&L

WC McQUAY UP&L

Steve Robison USFS

Sam Hotchkiss USFS

Deborah L. Richardson Consultant

George K. Cotton Simons, Li and Assoc.

Henry F. Friedt Office of the Solicitor, USA Dept

D. Wayne Hedberg DOGM

Pg. 2 -

EARL M. STAKER

Ronald W. Daniels

Shirley F. Leidsay

Stephen F. Manger

Jim Smith

Dorine R. Nelson

Herb Olsen

E. S. Crawford

Urie Ramana

DIV. OF WATER RIGHTS

Div. of Oil Gas & Mining

Office of Surface Mining

Office of Surface Mining

DOG M

DOG M

Att'y - Logan representing Ted Crawford.

Leslie Annan Salt Lake

Ecosystem Research Institute

BEFORE THE DIVISION OF OIL, GAS AND MINING
DEPARTMENT OF NATURAL RESOURCES
IN AND FOR THE STATE OF UTAH

---ooOoo---

IN THE MATTER OF THE MINING AND RECLAMATION PLAN, UTAH POWER & LIGHT COMPANY, DEER CREEK COAL MINE, ACT/015/018, EMERY COUNTY, UTAH : NOTICE OF INFORMAL CONFERENCE

---ooOoo---

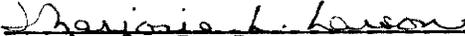
THE STATE OF UTAH TO ALL INTERESTED PARTIES IN THE ABOVE ENTITLED MATTER.

Notice is hereby given that the Division of Oil, Gas and Mining, State of Utah, will conduct an informal conference on Thursday, May 31, 1984, at 9:30 a.m. in the conference room of the Division of Oil, Gas and Mining, 4241 State Office Building, Salt Lake City, Utah. The mining and reclamation plan application for the Deer Creek Mine shall be discussed at that time.

Any interested firm, person or corporation shall be entitled to appear at the time and place aforesaid to be heard by the Division. The Application may be inspected in the office of the undersigned, 4241 State Office Building, Salt Lake City, Utah.

DATED this 8th day of May, 1984

STATE OF UTAH
DIVISION OF OIL, GAS AND MINING


Marjorie L. Larson
Administrative Assistant

Herm Olsen
HILLYARD, LOW & ANDERSON
A PROFESSIONAL CORPORATION
ATTORNEYS AT LAW
175 EAST FIRST NORTH
LOGAN, UTAH 84321
TELEPHONE (801) 752-2610

Exhibit
A

PETITION FOR DESIGNATION OF EAST MOUNTAIN
AS AN AREA UNSUITABLE FOR SURFACE EFFECTS
OF UNDERGROUND COAL MINING ACTIVITIES

Pursuant to Volume 30 of the Code of Federal Regulations on underground mining regulations, and regulations pertaining to Surface Effects of Underground Coal Mining Effects (UMC 764), Edward S. Crawford hereby petitions the Office of Surface Mining of the Department of Interior and the Division of Oil, Gas and Mining for the State of Utah to designate East Mountain as an area unsuitable for the surface effects of underground coal mining activities.

Said Petition seeks to have the East Mountain area designated as "fragile lands", in that East Mountain (and particularly 302 acres owned by the Crawford family) contains "...natural, ecological, or esthetic resources that could be damaged or destroyed by surface effects of underground coal mining activities" [and] "...areas of recreational value due to high environmental quality..." See UMC 762.5.

Petitioner seeks consideration of East Mountain as a "natural hazard" area, and therefore unsuitable for surface effects of underground coal mining activities. Said natural hazard designation is appropriate because "...natural conditions exist which pose or...may pose a threat to the health, safety or welfare of people, property or the environment, including areas subject to landslides...and areas of unstable geology." See UMC 762.5.

The Petition is based on competent, scientifically sound data and other relevant information. Petitioner has an interest which has been, is, and may be further adversely affected by the underground coal mining activities of Wilberg Mine.

Petitioner further requests a hearing be held on the designation sought herein.

The following information is submitted in support thereof:

UMC 764.13: Petition to the State of Utah for Designating Lands Unsuitable for Surface Effects.

(b)(1) Name: Edward (Ted) Crawford

Address: 1809 Yale Crest Avenue, Salt Lake City, Utah

Telephone #: (801) 582-4092

(b)(2) Legal Description: N1/2 Sec 21 17S 7E (see attached map)

(b)(3) Description of Activities and Adverse Effects:

As noted in the applicants subsidence monitoring programs (Utah Power and Light 1981 and 1982), the practice of room and pillar mining within the Wilberg and Deer Creek Mines was replaced in 1980 with the practice of longwall mining. This new technique, which was established and implemented after January 4, 1977, has produced and will continue to produce substantial environmental impacts on the surface renewable resources. These impacts were not observed prior to the implementation of longwall mining and the subsequent surface subsidence. The petitioner believes that the subsidence on his property and adjacent lands will irrevocably damage the hydrological balance and therefore, the foreseeable beneficial use of these properties. It will diminish or destroy long-term maintenance & availability of environmental values.

(b)(4) Petitioners Interest:

Mr. Ted Crawford and his family are the surface owners of the property in question under which longwall mining is occurring. They feel that the

recreational potential (wildlife, esthetics, hydrologic balance and culinary) and other beneficial uses of the land will be damaged. This constitutes a critical adverse impact on short-term and long-term development potential of area for one (1) acre Mountain Cabin sites. (7) Supporting Evidence:

(i) Reclamation feasibility: It has been stated in UP&L's mining application (for both the Wilberg and Deer Creek Mines) under their reclamation plan (UMC 784.14) and the subsidence control plan (UMC 784.20) that "...it is still possible that the ground water systems will be altered. The normal downward movement of ground water may be interrupted when it intersects the mine workings..." (page 4-34 Deer Creek & Wilberg Mine applications) and "the springs on East Mountain above the Deer Creek Mine (Wilberg Mine) might be affected by subsidence due to mining. It is possible that some of the ground water flowing to springs would be diverted to different areas forming new springs or increasing the flow to existing springs. It also is possible that some water will be diverted from the surface downward along fractures caused by mining" (page 4-35 Deer Creek & Wilberg Mining applications).

The applicant agrees with their control plan, "...that renewable resources are present in the area in the forms of springs, water seeps, grazing land, timber and wildlife (page 4-41 Deer Creek and Wilberg Mining applications). Cabins in the area also use these springs as a major source of culinary water."

Under Section UMC 783.17 (Alternative Water Supply Information) and UMC 817.97 (Protection of Fish and Wildlife) it is stated that the loss of water will be mitigated in the following manner:

783.17 (page 2-99 Wilberg and Deer Creek Mining applications).
"The mining completed in the Deer Creek and Wilberg Mine may alter or disrupt the flow of water on the surface of East Mountain. Presently, these waters are put to limited use for livestock and wildlife, or in a few cases, for culinary water for cabins.

If the mining activities affect the surface waters, water from adjacent springs may be diverted to flow into the area where other springs may have stopped flowing. Many springs are present in the area which could be diverted.

If the springs on East Mountain were not an ample water supply to replace the disrupted water, then water could be pumped to the surface from the Deer Creek Mine, surrounding streams, or wells which could be developed on the property."

AND

817.97 (page 4-50 Wilberg and Deer Creek Mining applications).
"However, it is accepted that a potential for disturbance does exist; therefore, mitigation measures will be initiated if disturbance does occur.

Surface water will be replaced or repaired by the following methods:

1. Streams will be bridged across bedrock fractures by culverts until sediments fill the creek.

2. Springs and seeps flows lost to subsidence action will be replaced by guzzlers.

These methods require little maintenance and will provide a semi-permanent fix to surface water problems that can be attributed to subsidence and liability determined by courts."

It is our belief that the measures proposed above are not only totally inadequate for protecting or restoring surface waters but are technologically impossible for protecting or restoring the hydrologic balance, of which the surface water is only a portion.

The terrestrial community for the area in question is directly related to this hydrological balance, primarily the diffuse discharge of the ground water aquifers. If longwall mining is used, by the applicants own admission, subsidence will result with the potential concurrent loss of surface water and by inference the associated groundwater. The geologic structures housing/groundwaters cannot be repaired or replaced, with a consequent permanent loss of ground water resources.

(7)(ii)(C) Affect Renewable Resources by Reduction of Long-Term Productivity of Water:

Within the arid west, water is an extremely important commodity. In correspondence to the Utah Division of Oil, Gas and Mining, concerning the water resources on East Mountain, N.J. Carlile, geologist from the United States Forest Service noted that "Industry has a responsibility to protect the surface resources and to quantify the impacts associated with the

(mining) activity." He further states, "...the Forest Service concern is for perpetuating the present surface resources which are dependent upon the existing waters on East Mountain (Memo to Forest Supervisor through Forest Engineer. Manti-LaSal National Forest - August 18, 1980).

At the present time, in the Deer Creek Mine 4th, 5th, 6th and 7th East panels (Section 22) have been removed. Longwall mining started in this area in 1979 through 1981. In August 1981, longwall mining, through the Wilberg Mine has removed the lower coal seams (10th right). Surface subsidence over this area has reached five feet in depth. No springs are located in this area which is 1/4 mile west of the properties in question.

Furthermore, adjacent to the property of Ted Crawford (south side of Grimes Wash) longwall mining is removing two seams of coal (Deer Creek Mine panels 1st, 2nd, 3rd, 4th right; and the lower seam Wilberg 1st west to 3rd west). Because of the topographic changes in this area (800-1000 less feet of overburden) and the presence of springs, this area should be considered fragile lands. The applicant has stated that the discharge of the springs in the area are directly related to the previous precipitation. A re-analysis of the applicants data (UP&L Hydrological Monitoring Program Data Summaries, 1979, 1980, 1981 and 1982) has shown (Figure 1) that springs in the area which are discharging from the upper strata of rock (North Horn formation) are related to precipitation. However, the springs on Mr. Crawford's property, which are discharging from elevations 800 feet lower (Price River formations) than the previously mentioned springs, have been continuously decreasing in flow as longwall mining in the area has progressed. These springs which are adjacent to mining activity will be impacted to a greater

degree by subsidence because of their lower elevation relative to the coal seams (see Figure 3, page 4-44, Deer Creek, Wilberg Mining application) and because of their lack of seasonal recharge. The continual decrease in the springs discharge volumes indicate mining impacts presently occurring with mining adjacent to the properties. Once total mining has been completed, it is believed that the total hydrologic balance of the East Mountain environment will be severely altered, with a substantial reduction or loss of groundwater and surface waters. There is no doubt that this loss of water will reduce the long-term productivity of the properties.

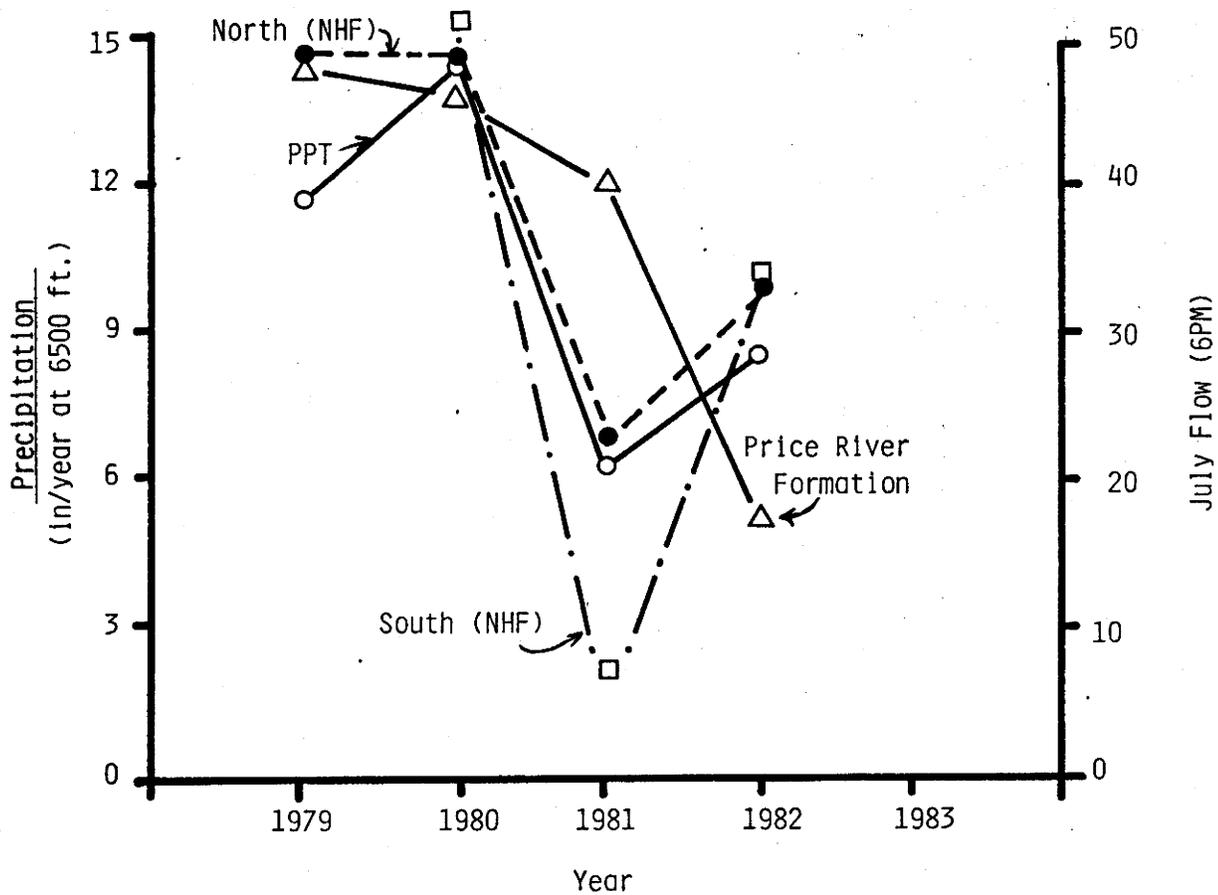
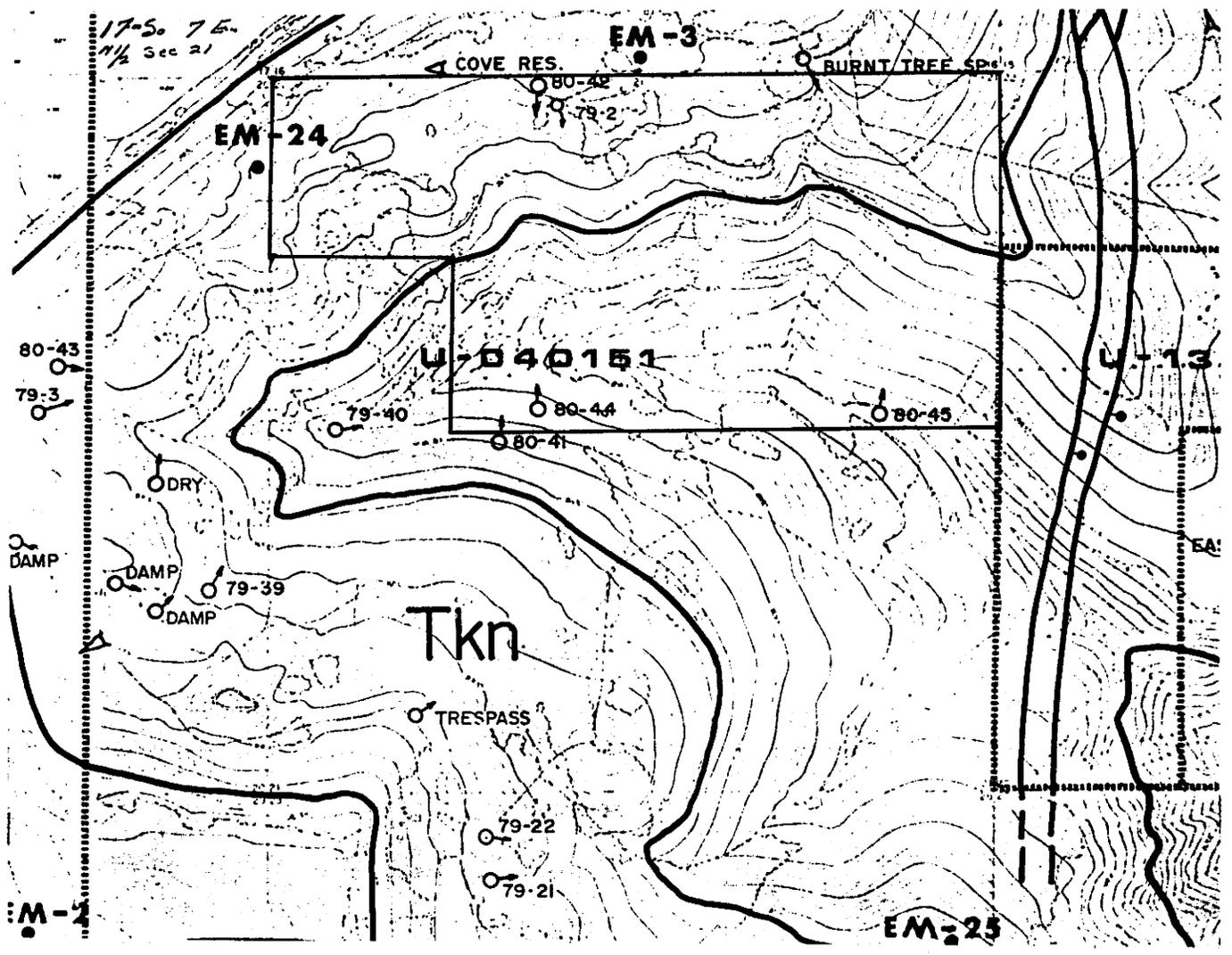


Figure 1. The comparison between the springs whose sources are from different geologic strata in the Grimes Wash area. NHF represents the North Horn Formation, North Springs and South Springs. The springs from the lower Price River Formation are also shown. 1979 data for Price River Springs from Dannielsen et.al. 1981.

Attached to Ex. A.



September 6, 1979

Memo to Coal File:

RE: Utah Power & Light
Wilberg Mine
ACT/015/018b
and
Deer Creek Mine
ACT/015/018a
Emery County, Utah

On August 2, 1979, an on-site inspection of Mr. E.S. Crawford's East Mountain property in Emery County was performed by State and federal officials and Utah Power and Light Company representatives at Mr. Crawford's request. Jim Smith, Reclamation Soils Specialist, represented the State Division of Oil, Gas and Mining and Tom Ehmett, Reclamation Specialist, represented the Region V Office of Surface Mining. Utah Power and Light Company personnel present were Chris Shingleton, Director of Services; John Bootle, Senior Mining Engineer, Rodger Fry, Exploration Geologist; and Ed Agoston, Exploration Geologist and Hydrologist. Also present, besides Mr. Crawford, were Vince Lamarra, Professor of Limnology at Utah State University, and Dan Black, a graduate student from Utah State University. Mr. Lamarra is also Mr. Crawford's son-in-law.

Mr. Crawford owns the surface of approximately 300 acres of land above Utah Power and Light Company's underground Wilberg and Deer Creek Coal Mines. The purpose of the visit was to view surface damage, specifically subsidence, which Mr. Crawford claims is a result of Utah Power and Light's underground mining operations.

The area of immediate concern is adjacent to Mr. Crawford's north property line of Section 21, Township 17 South, Range 7 East. The area is just below the highest elevation on a relatively steep south facing slope with the predominant vegetation being an aspen community. According to Mr. Agoston this was the top of the North Horn Formation.

Upon inspection of the disturbance it was determined that the damage was not due to subsidence, but was a soil slump about 150 feet long which had naturally taken place. The dead trees were probably the result of root shearing as the soil moved down the slope. The area is naturally unstable due to a combination

Memo to Coal File
Utah Power & Light
September 6, 1979
Page Two

of many factors such as the geology and the unconsolidated surface material, the soil characteristics, the steep slope, and climatic conditions. The instability of the area was evidenced by older slides in the vicinity and the characteristic curving of the tree trunks.

According to Mr. Bootle, ^{They are under now.} the nearest mining activity under Mr. Crawford's property is approximately one-half mile east and longwall operations are not anticipated under this area until sometime around 1989. The depth of overburden from the top of the lower coal seam to the surface is in excess of 1,000 feet.

Mr. Crawford indicated some concern regarding mining in the fault zone, but Mr. Bootle stated that the fault would not be mined and that a buffer zone approximately 150 feet wide would be left. Other concerns of Mr. Crawford which were discussed dealt primarily with the identification and monitoring of springs in the area, his water rights, and Utah Power and Light Company's plans to handle any water problems which may arise due to their underground mining operations and possible subsidence. One additional item which Mr. Crawford felt was a problem concerned a drill pad on adjacent Forest Service land that had not been reclaimed to his satisfaction. He was advised to consult with the Forest Service regarding this matter.

Mr. Lamarra also indicated that they (the Crawfords) were planning to construct a 10,000 square meter pond on the property near the cabin and stock it with trout. The pond would be 5 to 6 feet deep and would be fed by Mary Ann Spring.

JWS
JAMES W. SMITH, JR.
RECLAMATION SOILS SPECIALIST

JWS/te

cc: Mr. E.S. Crawford ✓
Mr. Murray Smith, O.S.M.
Mr. Chris Shingleton, U.P. & L.

DEPARTMENT OF THE INTERIOR

DRAFT

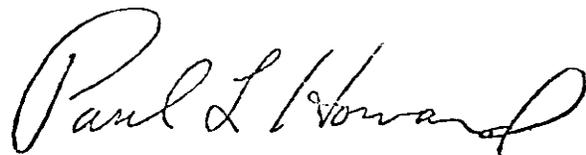
ENVIRONMENTAL STATEMENT

EMERY POWER PLANT

Prepared by

BUREAU OF LAND MANAGEMENT
DEPARTMENT OF THE INTERIOR

June 14, 1976



State Director, Utah State Office

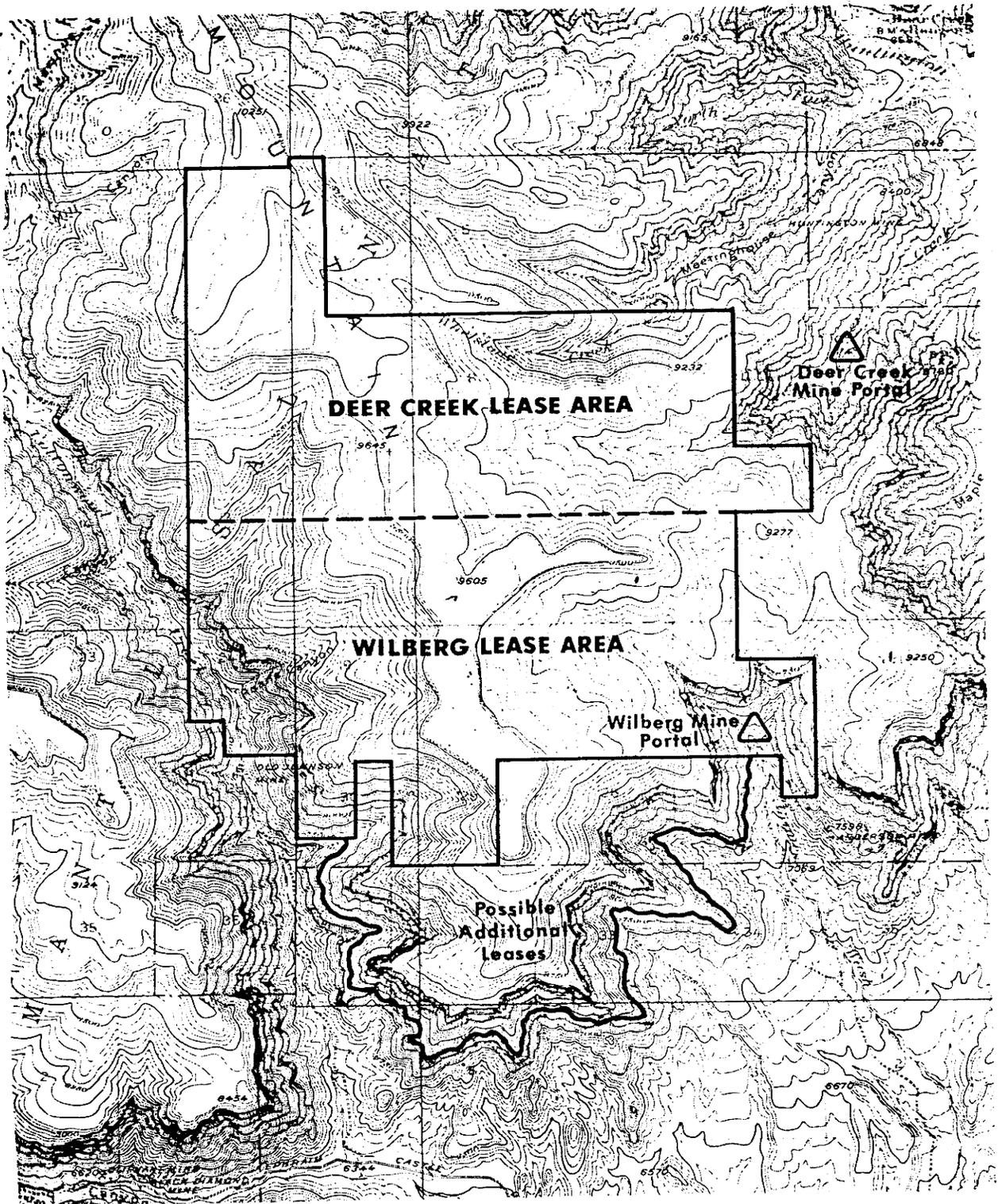


FIGURE 2-6

**SURFACE TOPOGRAPHY IN THE WILBERG
AND DEER CREEK MINE LEASE AREAS**

CHAPTER 3

THE ENVIRONMENTAL IMPACTS OF THE PROPOSED ACTION

A. INTRODUCTION

This chapter summarizes the various environmental impacts that would be expected from construction and operation of the proposed power plant. Impacts are identified as to cause and effect. Where impacts appear to be significant, the magnitude, incidence, and duration of the impact are discussed. Whether the impact has national, regional, or local significance is also indicated. (page 3-7)

D. GEOLOGY AND TOPOGRAPHY

1. Mine Site

On East Mountain, above the coal mine, subsidence (sinking) could occur on 4,658 acres (Table 2-13) which is the area covered by the coal lease (USGS, 1976). The location where subsidence would be expected to occur is shown in Figure 2-6.

Subsidence occurs as the roof collapses into the spaces created after coal is mined. Using a general formula for predicting subsidence (Brauner, 1973), maximum subsidence on East Mountain would be 1 to 5 feet. Since the Wilberg coal seam that would be mined under lease extends approximately 800 acres (USGS, 1976) under the Deer Creek Mine (which is being mined at this time), 800 acres of the 4,658 acres would be subject to a maximum subsidence of 5 to 10 feet. The exact location of the 800 acres cannot be determined at this time (USGS, 1976). The actual surface area affected by subsidence would extend beyond the coal lease area. However, it is estimated that the peripheral zone that would experience subsidence is less than 100 feet (USGS, 1976). (page 3-30)

Subsidence following mining operations could intercept ground water aquifers above the mining areas. This disturbance of geologic formations could alter both the ground water and surface water regimes. Springs, including nine that have been measured, could be affected with the possible loss of over 180 acre-feet per year of surface discharge. This subsidence could also eliminate stream flow in reaches of Roan Canyon, Deer Creek, and in the headwaters of Grimes Wash. Estimates of the magnitude of impacts are unavailable for these three drainages. Similarly, water levels at Snow and Flag lakes might change because of mine subsidence. Predictions of whether water levels would be raised or lowered by the changes cannot be substantiated.

Reduction or changes in water sources could affect livestock grazing which is dependent on these waters. (page 3-44)

CHAPTER 5

ANY ADVERSE IMPACTS WHICH CANNOT BE AVOIDED SHOULD THE PROPOSAL BE IMPLEMENTED

A. INTRODUCTION

This chapter summarizes adverse impacts which would affect the human environment and which cannot be avoided should the proposal be implemented. The mitigating measures in Chapter 4 have been subtracted from the total impacts described in Chapter 3. The remaining adverse impacts are set forth herein.

It should be clearly understood that many of the impacts identified here can be avoided, but because of lack of regulations, policies, or other incentives they most likely would not be. (pages-3)

D. GEOLOGY AND TOPOGRAPHY

Subsidence may occur on 4,658 acres of land above the Wilberg Mine as an estimated 70 percent of the coal is removed. The estimated depths of subsidence would be from 1 to 5 feet for about 3,858 acres of the leased area. About 800 acres of the seam being mined from the Wilberg portal lies beneath the seam being mined from the Deer Creek portal (USGS, 1976). Subsidence would be expected to double above this tract, at approximately 5 to 10 feet, as both seams are mined. A relatively narrow peripheral zone around the leased area would also experience some subsidence, but this would be hardly discernable. There are presently insufficient data to estimate the extent of occurring surface cracks, bulges, and sinkholes. (Page 5-8)

2. Specific

Subsidence following mining operations could intercept ground water aquifers above the mined areas. Springs, including nine that have been measured, could be affected with the possible loss of over 180 acre-feet per year of surface discharge. This subsidence would also eliminate stream flow in reaches of Roan Canyon, Deer Creek, and in the headwaters of Grimes Wash. Estimates of the magnitude of impacts are unavailable for these three drainages (impacts could affect as many as 500 cattle on summer range). Similarly, Snow and Flag lakes might experience changes in water levels because of mine subsidence. Predictions of whether water levels would be raised or lowered by the changes are unavailable. (Page 5-11)

CHAPTER 6

THE RELATIONSHIP BETWEEN LOCAL SHORT-TERM USES OF MAN'S ENVIRONMENT AND THE MAINTENANCE AND ENHANCEMENT OF LONG-TERM PRODUCTIVITY

A. INTRODUCTION

This chapter discusses the extent to which the proposed Emery project involves trade-offs between short-term commitments of resources, and the long-term maintenance and availability of environmental values. The chapter will also establish the reduction of long-term opportunities resulting from short-term use.

Short-term is to be understood in this context as the lifetime of the generating complex; long-term is that period beyond. *page 6-3)*

C. GEOLOGY AND TOPOGRAPHY

Subsidence of from 1 to 5 feet on 3,858 acres and from 1 to 10 feet on an additional 800 acres above the Wilberg Mine could occur and would represent an irreversible change to geologic formations on some 4,658 acres. *(page 7-4)*

The possible disruption of ground water aquifers, resulting from coal mining activities and subsequent subsidence in mined-out areas, could result in the loss of over 180 acre-feet per year of surface discharge. The loss of this surface discharge would be an irretrievable commitment of water resources. *(page 7-6)*

58.5 Million gallons.

ECOSYSTEM RESEARCH INSTITUTE

314 North Main
Logan, Utah 84321
801-752-2580

December 23, 1981

Mr. Edward Crawford
1809 Yalecrest
Salt Lake City, Utah 84108

Dear Mr. Crawford:

As per your instructions, our firm has undertaken a survey of Grimes Wash located on your property (Township 17 South, Range 7 East, Section 21; south half of the north half of Section 21). The enclosed Table 1 summarizes our findings. In general, a quantitative sample indicated seven species of aquatic insects with a density of 1988 individuals per meter squared. The life history of these species indicates a complex trophic structure with herbivores (those organisms which eat algae), detritivores (those organisms which eat terrestrial leaves), and predators. The organisms have univoltine (one generation per year) and multivoltine (many generations per year) life cycles. It is apparent that all of these insects require flowing water the entire year in order to complete their life cycles.

In our opinion, the stream ecosystem located on your property is extremely pristine. The community that existed on October 24, 1981, indicated that the stream has flowed continuously for an extended period of time. It is our opinion that the stream can support a recreational salmonid fishery if managed properly. A report will be forthcoming on that subject as you requested. If you have any questions, please do not hesitate to contact us.

Sincerely,



Dr. Vincent Lamarra
President

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Enclosure

Table 1. The taxa and numbers/m² of insects collected on October 24, 1981, at Grimes Wash, located at Township 17 South, Range 7 East, Section 21; south half of the north half of Section 21.

<u>Taxa</u>	<u>Numbers/m²</u>
Ephemeroptera	
Heptagenidae	11
Baetidae	555
Caenidae	11
Plecoptera	
Perlodidae	1100
Trichoptera	
Limnephilidae	156
Diptera	
Psychodidae	33
Chironomidae	122
Totals (#'s/m ²)	<u>1988</u>

Certified by: Dr. Vincent Lamarra, President



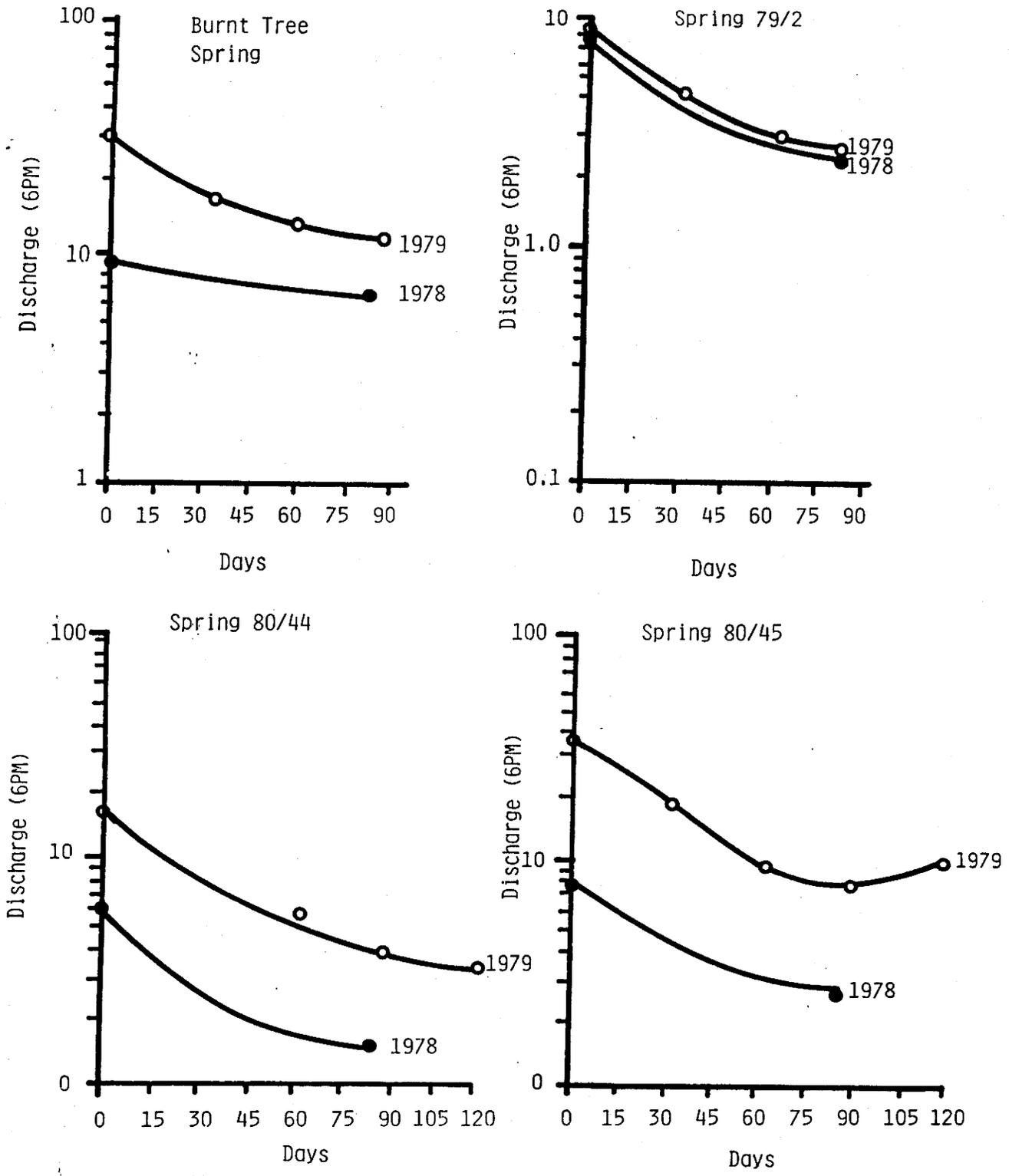


Figure The discharge regression curves for selected springs on East Mountain. Data from Danielson et. al. 1981.

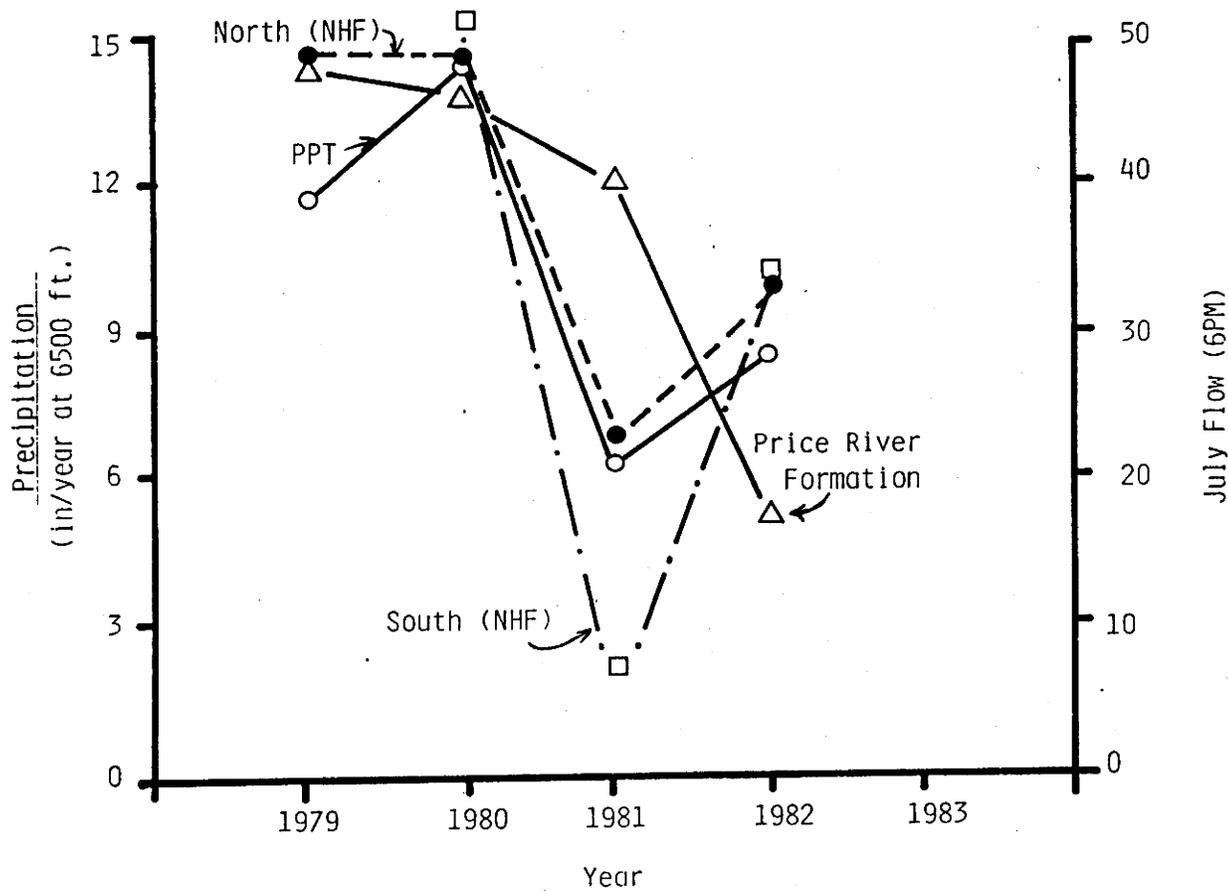


Figure 1. The comparison between the springs whose sources are from different geologic strata in the Grimes Wash area. NHF represents the North Horn Formation, North Springs and South Springs. The springs from the lower Price River Formation are also shown. 1979 data for Price River Springs from Dannielson et.al. 1981.