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Trial Transcript, Vol. X, Morning Session

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BOX 117
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BOX 10

case # 4993

File # 117

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IN THE DISTRICT COURT FOR THE FIFTH JUDICIAL DISTRICT
WASHAKIE COUNTY, STATE OF WYOMING

IN RE:)
)
THE GENERAL ADJUDICATION)
OF RIGHTS TO USE WATER)
IN THE BIG HORN RIVER) Civil No. 4993
SYSTEM AND ALL OTHER)
SOURCES, STATE OF WYO-)
MING.)

BEFORE: The Honorable TENO RONCALIO, Special Master
Presiding.

~~FILED~~ _____
2/25 1981
Margaret V. Hampton CLERK
VOLUME 10 _____ DEPUTY

BE IT REMEMBERED that on this 9th day of
February, 1981, Federal Building, Courtroom 3, Cheyenne,
Laramie County, Wyoming, the above-entitled matter came
on for trial before the Honorable Teno Roncalio,
Special master Presiding, whereupon the following
proceedings were had, to wit:

PROCEEDINGS:

ORIGINAL

APPEARANCES

1

2

3

FOR THE STATE OF
WYOMING:

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MR. MICHAEL D. WHITE
Special Assistant Attorney
General
2900 Energy One Building
717 17th Street
Denver, CO 80202

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FOR THE UNITED STATES
OF AMERICA:

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MS. REGINA SLEATER
Attorney at Law
Land and Natural Resources
Division
Federal Building
Cheyenne, WY 82002

MR. TOM ECHOHAWK
Attorney at Law
Land and Natural Resources
Division
1961 Stout Street
Denver, CO 80294

MR. JOSEPH MEMBRINO
Attorney at Law
U.S. Department of Justice
Washington, DC 20006

FOR THE ARAPAHOE
TRIBE:

WILKINSON, CRAGUN & BARKER
1735 New York Ave., N.W.
Washington, DC 20006
BY: MR. R. ANTHONY ROGERS

FOR THE SHOSHONE
TRIBE:

SONOSKY, CHAMBERS & SACHSE
200 M. Street, N.W.
Washington, DC 20006
BY: MR. HARRY SACHSE

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Division
Federal Building
Cheyenne, WY 82002

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Attorney at Law
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1961 Stout Street
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FOR THE SHOSHONE
TRIBE:

SONOSKY, CHAMBERS & SACHSE
200 M. Street, N.W.
Washington, DC 20006
BY: MR. HARRY SACHSE

1 THE SPECIAL MASTER: Appearances, please, on
2 this February 9th.

3 (No response.)

4 THE SPECIAL MASTER: Appearances, please.

5 MR. ECHOHAWK: Tom Echohawk for the United
6 States.

7 MR. MEMBRINO: Joseph Membrino for the United
8 States.

9 MS. SLEATER: Regina Sleater for the United
10 States.

11 MR. SACHSE: Harry Sachse for the Shoshone
12 Tribe.

13 MR. ROGERS: Tony Rogers for the Arapahoe
14 Tribe.

15 MR. WHITE: Michael D. White for the State of
16 Wyoming.

17 THE SPECIAL MASTER: All right, Ms. Sleater,
18 proceed.

19 MS. SLEATER: Your Honor, at this time the
20 United States would like to call Mr. Al Kersich, and
21 Tom Echohawk, associated in this case with us, will
22 be presenting the witness.

23 THE SPECIAL MASTER: Thank you.

24 Would you raise your right hand, please.
25

ALBERT KERSICH

1 having been first duly sworn, was examined and testified
2 as follows, to wit:

DIRECT EXAMINATION

3 BY MR. ECHOHAWK:

4 Q Would you please state your name.

5 A A. T. Kersich.

6 Q Mr. Kersich, where do you reside?

7 A Billings, Montana.

8 Q And what is your current occupation?

9 A I'm the president and principal in charge of the
10 water resources section of H.K.M. and Associates.

11 Q And Mr. Kersich, how long have you been president
12 of H.K.M.?

13 A Approximately six years.

14 Q And would you give us a general -- the general
15 size of H.K.M.?

16 A Well, we vary from month to month, but it's about
17 100 employees on a year around basis.

18 Q Mr. Kersich, how long have you been with H.K.M.
19 or its predecessors?

20 A Since about, it will be 25 years in March.

21 Q Mr. Kersich, would you give us a brief over-
22 view of your work experience prior to the time

23 kersich-direct-echohawk
24
25

1 you joined H.K.M.

2 A Prior to joining H.K.M. I'd been employed by the
3 Bureau of Reclamation at various times, both
4 during my coop training in college -- I went to
5 the Coop Engineering University, and I was with
6 the Bureau at that time during my training periods.
7 And then I was in the service, and then I went
8 back to the Bureau for about a year, a year and
9 a third, a quarter, something like that.

10 Q What were your general duties when you were em-
11 ployed with the Bureau of Reclamation?

12 A During my Coop periods I spent training periods
13 within the various areas of the Bureau such as
14 irrigation designs section, the quality control
15 construction management, aerial photography, land
16 classification, things of this nature; 90-day
17 training periods in each of those sections. After-
18 wards, when I came back from the service, I was
19 with both -- I was with the Yellowstone District
20 Office which was headquartered in Billings, and
21 eventually moved to Cody, Wyoming. And during that
22 time I was involved in some of the investigation
23 work being done on the Clarks Fork River Project
24 for hydroelectric development and eventual damming,

25 kersich-direct-echohawk

1 potential damming of Clarks Fork Irrigation

2 Development down below.

3 Q Would you give us a brief background, educational
4 background.

5 A Yes. I have a Bachelor of Science Degree in Civil
6 Engineering from the University of Detroit, and
7 received that degree in June of 1952.

8 Q Mr. Kersich, do you have any professional registra-
9 tions?

10 A Yes, I am a registered professional engineer in
11 Montana, Wyoming, North Dakota, Utah and New
12 Mexico. I also hold a certificate from the National
13 Council of Engineering Examinors as to my
14 qualifications.

15 Q And are you a member of any professional societies?

16 A Yes. I am a member of a number of professional
17 societies, including American Society of Civil
18 Examiners, the American Society of Agricultural
19 Examiners, the International Conference of Irrigation
20 and Drainage, the National Council of Engineering
21 Examinors, which I serve now as president elect
22 of that particular group, There's some others I'm
23 sure I forgot.

24

25 END TAKE

* * * * *

1 Q (By Mr. Echohawk) Mr. Kersich, would you please
2 explain your duties with the National Council
3 of Engineering Examiners?

4 A Okay. As president-elect this year, I'm the officer
5 in charge of the Committee on Uniform Exam
6 Qualifications for Professional Engineers, and
7 basically the National Council's primary respon-
8 sibility is to furnish an exam for professional
9 engineers of the various state boards, to the
10 roughly 50 jurisdictions that we have now.

11 And, as part of our effort this year, we
12 are involved in the upgrading of the examination
13 process and the development of a new scoring
14 process for equating the exam to determine the
15 minimum competency level for engineers.

16 Q Mr. Kersich, what is your involvement in the case
17 that we are involved in now?

18 A My particular involvement in this case is that of
19 the team leader on the soils effort or the
20 determination of the irrigability of lands in-
21 volved within the various study lands.

22 Q Is that irrigability?

23 A Correct.

24 Q Would you please define irrigability or irrigable

25 kersich-direct-echohawk

1 as used in this particular study is defined as
2 those lands that can sustain long-term irrigation.

3 Q Mr. Kersich, how does the determination of
4 irrigability fit in the overall scheme that the
5 United States is putting forward?

6 A Basically, the claim is being developed on a
7 three-pronged approach. There are soils or the
8 determination of the irrigability of lands, which
9 is the base that the agricultural engineer would
10 study to develop or design various irrigation
11 systems and determine costs of those systems, and
12 then the final approach, of course, is the economics
13 or the projected returns from those lands and a
14 comparison of the returns versus the costs or the
15 final determination of irrigability.

16 Q Mr. Kersich, have you ever been involved in a
17 situation where a similar approach such as this
18 as you have just described has been used?

19 A Yes, I have.

20 Q And where is that?

21 A The name of that case is Arizona versus California.

22 Q And what's the status of that litigation?

23 A That is in litigation. There are two more weeks
24 of testimony slated and then the testimony will be

25 kersich-direct-echohawk

1 completed and Special Master Tuttle then intends
2 to have a report to the Supreme Court on that
3 by July of 1981 for whatever would be the next
4 term of the Court.

5 THE SPECIAL MASTER: What is this Special
6 Master's name?

7 MR. ECHOHAWK: Tuttle.

8 THE WITNESS: Albert Tuttle, sir.

9 MR. ECHOHAWK: And I think he's a senior
10 judge of that circuit.

11 THE SPECIAL MASTER: Are you asking him or
12 telling him?

13 MR. ECHOHAWK: No, I'm letting you know.

14 Q (By Mr. Echohawk) Mr. Kersich, what was your
15 responsibility in the preparation of that case?

16 A My responsibility in that case was as the
17 agricultural engineer. I was involved in the
18 design of the various systems and the costing of
19 those systems and then worked with the economist
20 on the determination of the irrigability.

21 Q Have you ever used a similar approach in any of
22 your other work?

23 A Well, this is the basic approach that we're using
24 in our other Indian Reservations, the one that I

25 kersich-direct-echohawk

1 described here on Wind River, yes.

2 MR. WHITE: Your Honor, could I ask the
3 witness to speak up just a little bit?

4 THE WITNESS: I'm sorry.

5 MR. WHITE: I didn't mean to interrupt, but
6 it sure would be helpful.

7 THE WITNESS: Okay. Just wave and I'll speak
8 up.

9 Q (By Mr. Echohawk) Mr. Kersich, would you please
10 describe for us your duties as the principal in
11 charge of the Water Resources Division of H.K.M.?

12 A Okay. There I'm involved in everything and in
13 various capacities on various jobs. Some jobs
14 I'm involved in the procurement of the work, the
15 development of the scope of the work, the drafting
16 of the contract provisions, the setting up of all
17 the repayment provisions, which is an important
18 part of my work.

19 On other jobs I work as a consultant to other
20 teams that are in the office. For example, I may
21 be brought in to be a devil's advocate, for
22 example, or on a review of a design being com-
23 pleted by some other people, or I may actually check
24 computations.

25 kersich-direct-echohawk

1 I go to the field many times, and we have
2 what we call a plan-in-hand review. I'm involved
3 in that where we actually take our plans before
4 they are completed, go to the field, review the
5 circumstances that are controlling our designs
6 and whether our designs are the answer to those
7 circumstances.

8 And in some jobs I just get right down and
9 do the work.

10 Q: And what type of people are employed within the
11 Water Resources Division?

12 A Within the Water Resources Division we have civil
13 engineers, agricultural engineers, hydrologists,
14 civils with a basic interest in hydraulics. We
15 have geologists; we have geotechnical engineers;
16 we have people with experience in hydrographic
17 studies for water rights determinations.

18 We have land classifiers. We have soils
19 scientists, and as an adjunct to the Water
20 Resources section, we have a chemical and phy-
21 sical testing laboratory where we can test materials
22 and chemically test materials, things of this
23 nature.

24 Q Mr. Kersich, would you give us kind of a brief
25 kersich-direct-echohawk

1 overview of the type of work that the Water
2 Resources Division does at H.K.M.?

3 A We have a number of contracts with various
4 Indian Reservations on projects similar to this
5 one here. We have worked for private clients,
6 private farmers, irrigation districts, con-
7 servation districts.

8 In Montana conservation districts are an
9 arm of the State. They are set up under State
10 law. We have worked for industrial clients. We
11 have done work for both Intake Water Company,
12 which is a wholly-owned subsidiary of Tenneco,
13 and Gulf Oil, and we have done work for the State
14 of Montana on water reservation hearings, irrigation
15 projects, redesign of dams, and dam safety pro-
16 grams. I think --

17 Q In the various aspects of the work that you've
18 described, is a portion of that work soils related?

19 A Yes, the work for one of our industrial clients
20 had a reconnaissance or land classification with it.
21 We have done land classification studies on our
22 BIA work on Reservations, and we have done -- it
23 really isn't land classification work when you work
24 for a private farmer because normally you are

25 kersich-direct-echohawk

1 talking about a small project, 1,000 or 2,000
2 acres, but we have done the attendant work that's
3 required to do the engineering.

4 Q How about for your industrial clients?

5 A Yes, I thought I had mentioned that, but we did
6 do a reconnaissance land study as part of the
7 water rights request for one of our industrial
8 clients.

9 Q Why don't we get into a little more of the BIA
10 work that you have done on the various Indian
11 Reservations? Would you give us the names of
12 the Reservations that you have worked on or are
13 working on?

14 A Okay. Not including Wind River Reservation, we
15 have also worked on the Crow Reservation, where
16 we have done a similar study. We have been
17 responsible for the determination of irrigability
18 of soils and the evaluation of storage sites
19 for potential reservoirs.

20 On the Northern Cheyenne Reservation we have
21 done the evaluation of the soils for arability
22 as well as the hydrology and the preliminary
23 determination of potential storage sites.

24 We have done some work in New Mexico on
25 kersich-direct-echohawk

1 Jicarilla Apache Reservation, and there we were
2 responsible for the arability studies on soils
3 in conjunction with BIA. They had done quite a
4 bit of work prior to us becoming involved, so
5 we went in and reviewed their work and did our
6 work on additional lands.

7 There we also are involved with the
8 agricultural engineering. We are doing the
9 conveyance and project irrigation designs our-
10 selves, and in that particular instance the
11 economists are working as a subcontractor to us
12 for the determination of irrigability.

13 Water availability, I don't know whether
14 I mentioned that, but hydrology and water
15 availability are a portion of those studies also.

16 And on the Fort Berthold Reservation we
17 have done some semi-detailed land classifications.
18 to develop a block of land that could be used
19 for an eventual irrigation project.

20 Q Now, on the Crow and Northern Cheyenne Reservations,
21 you said you did some determinations there of
22 arability. Would that be land classification
23 work?

24 A That's correct, a similar program to what we
25 kersich-direct- echohawk

1 are talking about here on Wind River.

2 Q What level of study?

3 A It's called modified semi-detailed.

4 Q Do you recall the acreage amounts involved each
5 of those instances?

6 A I think our screening process eventually got us
7 down to about 200,000 acres, and then we did our
8 more intensive level of study on that 200,000
9 acres, and I'm not sure of the exact figures of
10 the arability, but it was about 100,000, I think.

11 Q Which Reservation was that?

12 A This was Crow.

13 Q And how about Northern Cheyenne?

14 A Northern Cheyenne is a much smaller Reservation.
15 I believe our study was around 50,000 acres, and
16 we're probably down around 30,000 on determination
17 of arable lands out of that.

18 Q What was your involvement or what is your involv-
19 ment in the Crow and the Northern Cheyenne and
20 Jicarilla Apache?

21 A Primarily the same as this. I was involved in
22 the development of the study program, field office
23 and land sections of that program, the land
24 standards that we are going to classify the lands

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toq and in the review of the work that's been performed todate, I have been involved in a field review and various office reviews of that, of the determinations made by the land classifiers in the field.

* * * * *

End 2

1 Q (By Mr. Echohawk) (Continued) Are those three
2 projects on-going or are they completed?

3 A Those are all on-going. They're going very
4 slowly, as a matter of fact. There's been
5 quite a bit of time spent getting to where
6 we're at today and no final conclusions have
7 been reached yet on any of those.

8 Q Okay. You mentioned earlier that you were
9 involved in Arizona vs. California. How many
10 reservations are involved in that?

11 A There are five, sir.

12 Q Would you name those?

13 A Yes. Beginning at Needle, California, we have
14 the Fort Mojave Reservation, Chemehuevi -- don't
15 ask me to spell that, please -- the Colorado
16 River Indian Reservation, The Fort Yuma Reservation
17 and Cocpah Indian Reservation.

18 Q You stated that when you did the --

19 THE SPECIAL MASTER: Just a minute.

20 If he can't spell them we better find somebody
21 who can for the reporter.

22 THE WITNESS: Tom, I think knows how.

23 (Off-the-record discussion.)

24 THE WITNESS: I'll check on those, sir,

25 kersich-direct-echohawk

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1 and give her the correct spellings.

2 Q (By Mr. Echohawk) I believe I asked you this;
3 you were involved in agricultural design on
4 that?

5 A That's correct. My job was as an ag engineer.

6 Q And would you call yourself an ag engineer then?

7 A Yes.

8 Q Mr. Kersich, in the design of agricultural systems
9 for those reservations, were you involved in
10 soils work at all?

11 A Yes, I was.

12 Q And how so?

13 A Well, my job was to review the soils work that
14 had been completed by another consultant and
15 see whether it gave us the information that we
16 required for the design of various systems on
17 those reservations. And as a consequence, it
18 was necessary for me to meet with the consultant,
19 first of all, read his report that was issued to
20 the BIA. He worked directly for BIA. My job was
21 to read the report, review it, determine if there
22 were any questions, which there were. Then later
23 I met with the soils consultant personally in
24 his office and at that time we reviewed the data

25 kersich-direct-echohawk

1 that he had accumulated, but had not been put in
2 a report, such things as logs, chemical testing
3 data, physical testing data such as analyses.
4 After that, after further discussions, why we
5 did develop a new program, where we did go back
6 to the field and did some additional visual
7 observations, chemical testing, soils testing,
8 things of this nature.

9 Q Why was it necessary to do additional work there?

10 A Well, we needed more information in some areas.
11 One step I forgot is that we actually went out on
12 the reservation with the people that were involved
13 in the study and viewed the plans that we were
14 going to work on. Sometimes you don't get all
15 the information on the logs or the aerial
16 photographs, and so we were able to stand there
17 and discuss it, discuss the limitations and
18 deficiencies, see if they were correctable or
19 possibly decide we couldn't work or change
20 classifications in some instances.

21 Q Mr. Kersich, in that situation did you always
22 agree with the classification assigned to the
23 various parcels?

24 A No, sir.

25 kersich-direct-echohawk

1 Q And what would happen when there was not an
2 agreement?

3 A A big argument: -- no, we would sit down and
4 discuss it. Many instances it resulted in
5 additional field work, additional laboratory
6 work and in some instances a final determination
7 was that there was a change in classification.

8 Q So in your opinion you think it's important for
9 the agricultural engineer to have close relations
10 with the soils program?

11 A Yes, very much so.

12 Q Why?

13 A There's an awful lot of things you have to worry
14 about in the ag engineering portion, and you
15 have to understand how the land classifier many
16 times arrived at his opinion, and how he delineated
17 the deficiencies in his mind at least. And knowing
18 that you can do a much better job than of designing
19 your systems to meet any deficiencies or to cover
20 lands you may have either overlooked or are not
21 giving due weight. So I think the two have to
22 have very good rapport and there has to be an
23 understanding of what each one is doing and how
24 it fits into the total plan.

25 kersich-direct-echohawk

1 Q Mr. Kersich, were you able to have some input
2 into the formulation of land classification
3 standards used in Arizona vs. California?

4 A Original land classification standards were those
5 that had been derived for the trial in the sixties,
6 as I recall. Those standards were used, and
7 then there was some modifications of those standards,
8 and I was involved in the modification of the
9 standards, yes.

10 THE SPECIAL MASTER: These are all still
11 on the California lands.

12 THE WITNESS: No, sir. These lands are
13 in three states. There's a small portion of lands
14 in Nevada, the largest portion of lands under
15 consideration are in Arizona, and the second
16 largest grouping would be those in California.

17 THE SPECIAL MASTER: Right.

18 THE WITNESS: The Colorado River
19 separates California and Arizona.

20 Q (By Mr. Echohawk) Mr. Kersich, I show you what
21 has been marked as United States Exhibit WRIR C-34.
22 Would you please describe for us what that is.

23 A Yes. This is a resume that I prepared for myself.
24 It covers my education, registration and experience

25 kersich-direct-echohawk

1 to date and the various work efforts that I've
2 been involved with.

3 MR. ECHOHAWK: I might note that on
4 page 2 there is the correct spelling of the
5 Chemehuevi Reservation.

6 O (By Mr. Echohawk) Mr. Kersich, is United States
7 Exhibit WRIR C-34 accurate?

8 A Yes, it is.

9 Q Mr. Kersich, how does land classification work
10 relate to agricultural engineering?

11 A Agricultural engineering is the designing of
12 systems, primarily -- both irrigation and
13 drainage, and this is work upon land, and land
14 classification studies are used as the basis
15 for determining the arability or whether the lands
16 can sustain irrigation, so it's the base of what
17 you do your design work on.

18 Q I'm not sure whether I asked you this a minute
19 ago, I'll try it again. Is it important to
20 have the agricultural engineer involved in the
21 determination of arability?

22 A Yes, I think so.

23 Q And why?

24 A Simply because many of the parameters that are

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used by the land classifier to establish the arability of lands are used in the design of these systems. For example, texture, surface texture, knowing what type the land surface textures are. The ag engineer can make a determination of infiltration rates and applications rates. And as you go through a set of land classification standards, there are some portions in each of those parameters that are of concern to the agricultural engineer, so you know what a person is going to look for or how it relates to his parameters, it makes it more simple and more concise as far as your design work.

Q Are-you, as an agricultural engineer, able to make arability determinations then?

A I am, predicated on the input I have to the program, yes.

THE SPECIAL MASTER: May I hear that last end of the last question? "Are you, as an agricultural engineer" qualified to what?

(Thereupon the last question (was read back as follows: " Q (Are you, as an agricultural (engineer, able to make arability (determinations then?"

THE SPECIAL MASTER: And your answer?

kersich-direct-echohawk

1 (Thereupon the last answer
2 (was read back as follows: " A
3 (I am, predicated on the input
4 (I have to the program, yes."

5 THE SPECIAL MASTER: May I ask this: Does
6 that include the economic feasibility of projects?
7 Are you concerned solely with the land classifications?

8 THE WITNESS: At this point in time, sir,
9 I'm talking just merely about the determination of
10 whether the land is arable or not.

11 THE SPECIAL MASTER: All right, fine.

12 THE WITNESS: The economics haven't
13 come into it yet.

14 Q (By Mr. Echohawk) You said, I believe, predicated
15 on your input into the program; is that right?

16 A Yes, that's correct.

17 Q Would you elaborate a little more on what your
18 input into the program is?

19 THE SPECIAL MASTER: I thought he said
20 other inputs not his. That's the reason I asked
21 the question.

22 THE WITNESS: What I meant is my own
23 personal input, sir, into the program.

24 THE SPECIAL MASTER: That determines
25 your ability to pass judgment on the arability,

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is your own research and not others?

THE WITNESS: No, no. That's what I'm getting to. It's the total review of the program. It's really a four-step process, the way I've designed it. If I might, if I might, I might explain it. Right now the first thing I feel, it's very necessary to have some input into land classification standards to make sure the parameters they use for determining arability of land in the field are those which I can use in my design work later on.

Secondly, I think it's terribly important to have input into the actual field and lab program so that we know what level of effort is going into the field work, how the information is being reported so it can be utilized by people in the office; what chemical information is gained and how it is reported also.

Thirdly, as an ag engineer in this particular instance I feel it's important to have input into the type of people that are working on the project. For example, in our office I made the final determination of who is going to be involved in the field land classification effort, what their

kersich-direct-echohawk

1 qualifications might be, and actually I
2 interviewed all of the people personally to
3 determine their qualifications.

4 And finally, and most importantly, is that
5 I'm involved in the final review where we take
6 the work that's been accomplished by the people
7 in the field and some of those people as well
8 as other land classifiers in our firm, drainage
9 engineers and others are involved in final
10 determination of land classification. So my
11 opinion is predicated on the opinion of these
12 people plus any information that they have given
13 me during the final review process.

14 Q (By Mr. Echohawk) Mr. Kersich, would you give us
15 an overall general description of how you and
16 HKM went about determining the arable lands
17 in this case?

18 A Well, the first thing that we do is compile all
19 the available information, but a number of studies
20 completed within this area not over each piece
21 of ground we were interested in, but on adjacent
22 tracts, things of this nature. So we compiled
23 from the Bureau of Reclamation, from the State of
24 Wyoming, from anybody that had done work in the

25 kersich-direct-echohawk

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area, we tried to develop a backlog of all that information, get some idea of the level of studies, the results of those studies, the methods under which those studies were conducted.

The second thing is take the reservation as one large element, one large land tract and go through a screening process to develop study areas that we could financially handle.

THE SPECIAL MASTER: What do you mean that "you could financially handle"?

THE WITNESS: Right, from the amount of money and the time that we had, sir.

THE SPECIAL MASTER: Your budget of the program?

THE WITNESS: To actually go in the field and put the level of effort in and it wasn't reasonable to expect to put the same level of effort on every acre of ground, and therefore we tried to select those areas which were most -- displayed the capabilities potentially of having the most chance of being declared arable. So we screened the reservation and developed study areas. At that point, really simultaneously, we developed land standards predicated on

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discussions with other people who had been involved in the area, land classification standards were then developed. We went to the field and coordinated our office and laboratory program. Those were, the results of those programs were long and noted on various aerial photographs, things of this nature. Then eventually all that information was put together and a final determination of arability was made.

* * * * *

kersich-direct-echohawk

1 Q. (By Mr. Echohawk) Mr. Kersich, would you give us
2 a little more detail on the initial process of
3 screening through the lands?

4 A. Here again we started out with basic information.
5 We had the study that had been completed by the BIA
6 in 1962, a very low-intensity reconnaissance level
7 study.

8 After reviewing that study we selected
9 characteristics that were noted in that study that
10 we could use in the screening process.

11 Some of the things we were concerned about
12 were soil texture, so we had textures that would
13 be applicable to farming; depth to barrier,
14 because of drainage problems in the area, we
15 established the criteria that covered that
16 predicated on the 1962 study; water holding capacity,
17 which would give you some idea of the texture of the
18 soil as well as the amount of times you would have
19 to irrigate that so your level of management would
20 be reasonable; the hydraulic conductivity for the
21 measure of how fast water flows laterally through
22 soils --

23 THE SPECIAL MASTER: Was any distinction made
24 between these studies and that which would come from
25 kersich - direct - echohawk

1 central pivot irrigation from deep wells as
2 distinguished from surface irrigation?

3 THE WITNESS: As far as the water source at
4 this point in time, sir, we didn't pay any
5 attention. We were looking at land characteristics
6 only.

7 A. (By the Witness) And the final one was slope,
8 and we took a percentage of slope that we felt
9 would be reasonable for the various types of
10 systems that we placed on it.

11 That resulted then in reducing the land base
12 that we were studying from the Reservation
13 boundary less the withdrawal area, or about
14 two and a half million acres, roughly down to
15 490,000 acres.

16 Q (By Mr. Echohawk) Mr. Kersich, I direct your
17 attention to what has been marked as United
18 States Exhibit WRIR C-34. Maybe this exhibit
19 will assist you in explaining the screening
20 process.

21 A. Okay. This exhibit is entitled, "Study Area
22 Land Base Map, Wind River Indian Reservation,
23 Wyoming," and the Reservation outline is
24 depicted in this broad black line, and within that

25 kersich - direct - echohawk

1 we have various areas colored in green, and some of
2 those areas are further enclosed by a red border,
3 and what this amounts to is that we screened the
4 entire Reservation, and the lands colored in green
5 are lands which met the five screening criteria
6 I mentioned previously.

7 In other words, the slope was 20 percent or
8 less. It has textures that fell within the ranges
9 that we were looking for. The depth to barrier
10 was at least 36 inches or greater.

11 This isn't the final design yet, but this
12 was all the information that was available to us
13 at the time of the screening, so all these areas
14 enclosed in black and colored in green are lands
15 which would have met the minimum screening criteria.

16 Okay. Now, it became quite obvious that some
17 of those lands were rather high. Cropping patterns
18 would have been very limited. Also the availability
19 of water was a problem, and the study eventually --
20 we reviewed these areas and tried to set up study
21 areas contained within these red boundaries that
22 had a reasonable chance of meeting the irrigability
23 criteria so there was some additional work done where
24 we looked at distance, lift, cost, things

25 kersich - direct - echohawk

1 of that nature that you might get into, and then
2 further confined our studies or intensive level
3 studies to those areas that are bounded in red.

4 Q And how many of these study areas did you come up
5 with?

6 A Okay. We eventually wound up with six study areas,
7 and they are Owl Creek, located on the northern
8 boundary of the Reservation; the North Crow Heart
9 area, which is located north of the withdrawal
10 area, and starting here at Crow Heart -- Crow Heart
11 is up in here (indicating); the Big Horn Flats,
12 which is due south of North Crow Heart; the South
13 Crow Heart area, which is on the south side of the
14 Wind River; and the Arapahoe area, which is located
15 between the Little Wind and the Big Wind, as I
16 recall.

17 Q Is there one additional study on the east side?

18 A Yes, I'm sorry. There's one here on the east side
19 of the Wind River called the Riverton East.

20 Q Mr. Kersich, after the screening process was done
21 and you arrived at the six study areas, I believe
22 you mentioned that you developed some land
23 classification standards. Would you give us a
24 little better description as to how that was done?

25 kersich - direct - echohawk

1 A Well, we were fortunate in this area in that the
2 Bureau of Reclamation had done a considerable
3 amount of work on land classification studies.
4 They had done work in 1947, '48, in the '50's,
5 some in the '60's, and some in the '70's, actually.

6 So we obtained copies of those land
7 classification studies that they had used to
8 determine arability, and we studied them. We
9 actually discussed how those standards had been
10 developed by people like Ray Pasco, who had
11 been the regional soils scientist during part of
12 this time.

13 We discussed them with the people who are
14 now -- Tom Casey, who I believe is now the
15 regional soils scientist, and we talked to some
16 of the BIA people involved in irrigation management
17 on the Reservation.

18 We actually went out and spent some time on
19 the Reservation and looked at some of the irrigation
20 systems they currently used, whether they were
21 using sprinklers or not, which they were beginning
22 to use or had been using, and from that we
23 eventually sat down and developed a dual system of
24 standards that would cover both sprinkler and gravity

25 kersich - direct - echohawk

1 irrigation.

2 Q Mr. Kersich, who at HKM was involved in setting
3 up these land classification standards?

4 A Basically again this was a team effort. I was
5 involved as the ag engineer and had the ag
6 engineering input. Chick Smith, who is our
7 chief land classifier and who had been with the
8 Bureau of Reclamation -- had been with the Bureau
9 of Reclamation for about 26 years on similar type
10 work was involved. Mr. Ross Waples, who is a soils
11 scientist and land classifier was involved. Robert
12 Toedter, who had been with the Bureau of Reclamation as
13 a drainage engineer and had been working with me for
14 about four years, was involved in the drainage aspects
15 of it, and Ron Billstein was involved since Ron is
16 the head of the Water Resources section.

17 Q Could you give us a little more detailed
18 description of Mr. Toedter's background?

19 A Yes, Bob Toedter is an agricultural engineer.
20 I believe he graduated from the University of
21 Idaho, and he spent considerable time with the
22 Bureau of Reclamation. I can't remember the exact
23 time, but roughly eight years, I'd say, working
24 in drainage engineering and primarily in the

25 kersich-direct-echohawk

1 Columbia River Basin and over in North Dakota
2 on the Garrison Project on the drainage studies
3 there and then eventually transferred to the
4 regional offices as a drainage engineer and then
5 eventually went to work for H.K.M., and his work
6 with H.K.M. has basically been in the field of
7 drainage and irrigation management.

8 Q Mr. Kersich, why is it important to have
9 individuals with these various backgrounds
10 involved in the formulation of land classification
11 standards?

12 A Well, I don't think that one person knows it all.
13 I think it's too complex to just go off and
14 depend on one person's opinion, and each one
15 of us have a little different view of what we want
16 to know about the project and so on, and I think
17 it's good to get all the people together and get
18 their collective thoughts and develop a set of
19 standards rather than to depend on just one person.

20 Q Can you give us an example of one characteristic
21 that's considered in these land classification
22 standards and how each of these individuals would
23 have some input into that?

24 A Well, let's talk about Bob Toedter, for example.

25 kersich-direct-echohawk

1 Bob Toedter would be concerned about the hydraulic
2 conductivity of soils. If the soils are real
3 tight and the water takes a long time to travel
4 through the soil, that would reflect on the
5 amount of drainage that he would have to put in
6 an area to keep the root zone free of water.

7 Another thing he would be concerned about
8 would be the depth to barrier, and that's another
9 design consideration. If barrier is close to the
10 surface, the attendant economics would be
11 different than if it was much deeper, and his
12 input resulted in the drainage portion of the
13 specifications where we discussed having a
14 minimum hydraulic conductivity of one-tenth of
15 an inch per hour and a distance to barrier of
16 six feet, and this was put in with another
17 economic consideration of drain spacing that if
18 those resulted in a drain spacing which was less
19 than 200 feet, we would automatically discard the
20 lands and not certify them as irrigable, and you
21 can go through each portion of this and the input
22 of the soil scientist or the land classifier
23 would relate to such portions of this standard.

24 Q And how does your background as an agricultural
25 kersich-direct-echohawk

1 engineer contribute to the formulation of land
2 classification standards?

3 A Some of the things I'm concerned about are
4 texture, infiltration rates. I wanted to know
5 how the soil will accept the water so that I have
6 some idea of what I would expect from evaporation
7 losses, what type of application rates I should
8 use. The depth of soils and the water holding
9 capacity gives me some idea of the irrigation
10 scheduling that's required, the number of times
11 that you'd have to get back on the land to be
12 able to keep your root zone properly filled.

13 I'm concerned about the drainage. They
14 work together with our work because deep percolation
15 is a function of drainage, that water that gets
16 away that the crop can't use.

17 Those are just some. Salinity and alkalinity
18 would be of concern to me.

19 Q And why would that be of concern?

20 A Well, if we get drainage problems, we can't get
21 the water out fast enough. If it's toxic, if
22 it's full of salts, the various salts that are
23 toxic to plants, we're going to have poor yields
24 and we are not going to be able to afford the

25 kersich-direct-echohawk

1 systems that we are designing there.

2 Q Mr. Kersich, are the plant classifications
3 standards that were developed by H.K.M. based
4 on large projects or small project development?

5 A Well, you normally need land classification
6 standards for large projects because you have
7 contiguous blocks of land, one of the problems
8 that can affect lands in different ways and, there-
9 fore, you develop the standards based on the idea
10 that they are going to be irrigated as a large
11 project.

12 Q Now, in the formulation of the land classification
13 standards, was all the work done in the office?

14 A No, no, sir. We went out and talked -- as I
15 mentioned previously, we had talked to people in
16 the field. We had talked to people in the
17 Riverton office of the Bureau of Reclamation.

18 We actually went out in the field. Mr.
19 Waples and Mr. Smith both went out and reviewed
20 the effects of some of the other land classification
21 work that had been done and got some idea how the
22 land was responding to irrigation.

23 Mr. Toedter did go to the field and look at
24 some of the drainage work that had been completed

25 kersich-direct-echohawk

1 in the Riverton area and discussed in depth the
 2 drainage problems in that particular area, and
 3 that was some of the input that brought in -- I
 4 was out in the field, of course, and had a
 5 chance to see the type of systems that were being
 6 used, the methods of irrigation, and all of us
 7 were certainly interested in the cropping patterns
 8 that were developed in the area.

end 4

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1 Q (By Mr. Echohawk) (Continued) Mr. Kersich, I show
2 you what has been marked as United States Exhibit
3 WRIR C-36. Would you please identify those.

4 A Yes. This exhibit is entitled Table 2, Land
5 Classification Standards Wind River Indian
6 Reservation, Wyoming 3-79.

7 Q Mr. Kersich, are these the standards that were
8 formulated by you and the others at HRM?

9 A They are.

10 Q Would you please give us a brief description of
11 how these classifications -- these standards
12 were or how they're used?

13 A Yes. First of all, we set up four potential
14 classes of land, class 1 being the class of land
15 or the type of land which would have the least
16 deficiencies, potentially no deficiencies and
17 would provide the best returns.

18 Class 2 lands were lands which exhibited
19 some type of deficiency, possible slope or
20 something of this nature which might make it
21 more expensive to bring into production.

22 Class 3 then had more deficiencies, and
23 finally Class 4 was the class which had the
24 most deficiencies but would still be arable under

25 kersich-direct-echohawk

1 limited cropping patterns.

2 THE SPECIAL MASTER: What relationship
3 is there of these four classes of irrigable lands
4 to the four classes of irrigable lands long used
5 in and classified by the Bureau of Reclamation?

6 THE WITNESS: They're isimilar, sir.

7 Q (By Mr. Echohawk) Do the standards developed by
8 HKM parallel the ones used by the Reclamation?

9 A That's right. We try to keep them as close as
10 possible except for updating for more modern
11 methods, things of this nature.

12 I might just say then that the various
13 parameters that we're looking for are located
14 on the left-hand portion of each sheet, and the
15 level or the acceptability parameter are shown
16 then under the class. For example, if I might
17 give one, Class 1 soil would normally be the
18 lands which would have the deepest topsoil, have
19 the most waterholding capacity. For example, if
20 you're examining soil depth to clean sand, gravel
21 or cobbles under Class 1, we would require that
22 36 inches of fine sandy loams or 42 inches of
23 sandy loams are textural classes that the land
24 classifier can identify.

25 kersich-direct-echohawk

1 Q Mr. Kersich, are these classification standards
2 broken down into three main areas?

3 A Yes.

4 Q What are they?

5 A We're concerned about the soil, topography and
6 drainage. And under drainage, it is both surface
7 and subsurface. And I've been talking mostly
8 about subsurface drainage.

9 MR. ECHOHAWK: Your Honor, I offer what
10 has been marked as United States Exhibit WRIR C-36
11 into evidence.

12 THE SPECIAL MASTER: All right. 36 A, B,
13 C or is this all 36?

14 MR. ECHOHAWK: Just 36. It should have
15 been stapled together.

16 MR. WHITE: May I inquire of the
17 purpose of the offer; is it for the truth of the
18 contents or to illustrate the standards used or
19 what is the purpose of the offer?

20 MR. ECHOHAWK: Both the truth of the
21 contents and that these are the standards that
22 they used.

23 MR. WHITE: Could I have just a moment,
24 I'd like to voir dire on this?

25 kersich-direct-echohawk

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THE SPECIAL MASTER: Of course.

You're offering 36 only?

MR. ECHOHAWK: That's correct.

THE SPECIAL MASTER: Yes, Mr. White.

MR. WHITE: Would the Tribes counsel want to voir dire on this?

MR. ROGERS: No, I was on another matter.

MR. ECHOHAWK: Do you want the podium, Sandy?

MR. WHITE: Yes, please.

THE SPECIAL MASTER: While Mr. White is getting his voir dire, let me ask a question or two.

THE WITNESS: Yes, sir.

THE SPECIAL MASTER: You're designing engineer work to which you have alluded includes engineering for a source of water for these specific lands?

THE WITNESS: You mean in the past, sir?

THE SPECIAL MASTER: No, sir.

THE WITNESS: Under this project here?

THE SPECIAL MASTER: Yes.

THE WITNESS: No, we're not doing any of the engineering with regard to water sources.

THE SPECIAL MASTER: Question two, did kersich-direct-echohawk

1 an actual irrigation project ever get constructed
2 and results, successful operation from any of the
3 various programs you've worked on on the other
4 reservations or other matters which are contained
5 in your Exhibit 34 which you testified to?

6 THE WITNESS: Not on reservations. These
7 have been mostly litigation work. We have done
8 private work for individuals or for irrigation
9 districts that resulted in irrigation, yes, sir.

10 THE SPECIAL MASTER: Are you familiar with
11 expansion of irrigation districts on the Pole
12 Mountain Reservoir or -- I mean the Pole Cat Bench?

13 A On Pole Cat Bench, I have a familiarity with that
14 because that's one of the projects I worked on
15 back in the late '50's for the Bureau of Reclamation,
16 but that's been a long time ago.

17 THE SPECIAL MASTER: Are you familiar with
18 the Eden Valley, Farson or Big Sandy Reclamation area
19 of western Wyoming?

20 THE WITNESS: No, sir.

21 THE SPECIAL MASTER: Problems in
22 alkalinity, salinity and the failure over the
23 decades and decades?

24 THE WITNESS: No, sir, I'm not familiar

25 kersich-direct-echohawk

1 with that particular project.

2 THE SPECIAL MASTER: Okay, go ahead,
3 Mr. White.

4 VOIR DIRE EXAMINATION

5 BY MR. WHITE:

6 Q Mr. Kersich, are you absolutely certain that
7 WRIR C-36 were the standards which you used
8 throughout your arability analysis?

9 A These were the final standards, sir.

10 Q Were all your determinations of arability based
11 on those standards or were other standards used
12 during earlier parts of your studies?

13 A We had a sentence or two in the other standards
14 that eventually came out and these were the
15 standards that the final determination was made
16 on, to the best of my knowledge, and I used these
17 in my final review.

18 Q Do you recall your deposition on January 6th of
19 this year?

20 A Yes, sir, I do.

21 Q I hand you what's been marked as Plaintiff's
22 Exhibit WRIR SK-2 and ask you if you recognize
23 that?

24 (Brief pause.

25 kersich-voir dire-white

1 Q Do you recognize those?

2 A Yeah, I'm just checking them, okay? May I have
3 a minute, please?

4 Q You bet.

(Brief pause.)

5
6 A Yes, I recognize them.

7 Q Are those the standards which I just handed you
8 being Exhibit SK-2 identical to C-36?

9 A No, there is one difference.

10 Q And what is that difference?

11 A It's under Class 3, there's a sentence that says
12 on the WRIR SK-2 that says "There must be at least
13 2 inch per hour permeability in the top two feet
14 when SAR exceeds twenty."

15 THE SPECIAL MASTER: Where are you
16 reading from, which page?

17 MR. WHITE: First page, Your Honor.

18 THE WITNESS: I'm --

19 THE SPECIAL MASTER: You're not
20 reading under drainage, you're under soil and
21 texture?

22 THE WITNESS: I'm reading under alkalinity
23 of soil.

24 THE SPECIAL MASTER: Which column?

25 kersich-voir dire-white

1

THE WITNESS: Under class 3, sir.

2

THE SPECIAL MASTER: All right, thank you.

3

Q (By Mr. White) I believe you've marked that out on SK-2 during your deposition; is that correct?

4

5

A That's correct.

6

Q How about the footnotes on the third page, those are different aren't they? Doesn't footnote 2 in C-36 apply to something besides drainage?

7

8

9

A That's correct.

10

Q Doesn't footnote 2 in SK-2 apply to drainage?

11

A Wait a minute. The footnotes are exactly the same in the two.

12

13

Q Look where they appear in the text.

14

A Subsurface hydroconductivity under WRIR C-36 has footnote 3 and soil depth to barrier has footnote 3, yes. There was an error there that I didn't mark.

15

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17

18

Q Which one is correct?

19

A The 3 is correct, yes, sir.

20

Q So it should be 3?

21

A That's correct.

22

Q I notice on page 2 under class 3 for gravity, irrigation pattern and field size there's a

23

24

footnote 2 on SK-2. Is that the same, does that

25

kersich-voir dire-white

- 1 appear appropriately on C-36? Do you want
2 to have a 2 there instead of 3 or is that correct?
- 3 A I'm confused.
- 4 Q I'm sorry. Let's start over again on C-36.
- 5 A Okay.
- 6 Q Class 3.
- 7 A Yes.
- 8 Q Gravity irrigation pattern of field size, there's
9 a footnote 2.
- 10 A Um-hum.
- 11 Q Should that be footnote 2 or footnote 3?
- 12 A It should be footnote 2.
- 13 Q Okay. So we ought to jettison the footnotes in
14 the narrative portion or in the tabular portion
15 on SK-2 and adopt the footnotes that are in C-36?
- 16 A Let me say that C-36 is final land classification
17 standards that were used.
- 18 Q Did you change the standards that Mr. Toedter
19 developed?
- 20 A What do you mean?
- 21 Q Did you change the land classification standards
22 that Mr. Toedter developed?
- 23 A He didn't develop any land standards on his own;
24 he used the land classification standards in his
25 kersich-voir dire-white

1 determinations that are shown in WRIR 36.

2 Q I hand you what's been marked for identification
3 as Plaintiff's Exhibit WRIR SK-3.

4 Why don't we go ahead and turn to the last
5 page. Do you see footnote 4 there?

6 A Yes, I do.

7 Q Was that or was that not included in your land
8 classification standards?

9 A I believe on the undeveloped lands that was not
10 included. I'd have to check that, but to my
11 knowledge, it was not simply because these standards
12 were being, I believe when he gave his deposition,
13 he was modifying these standards for use on those
14 lands which had a historic record of irrigation.
15 And I'd have to check his deposition to make sure
16 he wasn't talking about that particular thing at
17 the time this was put in.

18 Q You're welcome to check the deposition. I'm
19 just curious to know whether or not you did or
20 did not have a drainage requirement for Class 4
21 lands because that's what the footnote says, no
22 drainage requirement is necessary for these lands.

23 A Well, the thing that puzzles me about this at the
24 same time is that it says we still show the same

25 kersich-voir dire-white

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parameters for the hydraulic conductivity and depth to barrier, and I'd have to feel that we used those in the final determination of any class 4 lands that were put in the undeveloped lands program, sir.

* * * * *

kersich-voir dire-white

1 Q (By Mr. White) So the final standards which
2 you used then, which are C-36, did not include
3 Footnote 4; is that correct?

4 A To the best of my knowledge, they did not on the
5 undeveloped lands.

6 Q How would you find out for sure?

7 A Well, I guess I would have to talk to Bob Toedter
8 about that.

9 Q I see on the top of C-36 there's a date with the
10 numbers 3-79. Is that the date on which those
11 were adopted or not? Is that March, '79?

12 A Yes, I think that would be the date that these were
13 finally --

14 Q So these weren't changed since that time?

15 A To my knowledge, no.

16 Q Who would know for sure?

17 A Well, it would have to be me, but no one has
18 discussed any changes of these standards with me.

19 Q So it's your testimony then that these are the
20 standards that were adopted in March of '79 and
21 have not since then changed; is that correct?

22 A Yes.

23 Q Now, would you please take a look at Footnote 2
24 of C-36? During your previous testimony you have
25 kersich - voir dire - white

1 gone to great pains to distinguish between
2 irrigable and arable.

3 THE SPECIAL MASTER: He has? I didn't
4 know that.

5 MR. WHITE: I'm sorry. Maybe I should ask
6 him if he did that.

7 THE SPECIAL MASTER: Would you do that,
8 please?

9 Q (By Mr. White) Is there any difference between
10 irrigable and arable?

11 A Yes, there is from my definition, yes.

12 Q And has your investigation that you've described
13 during your testimony so far applied to arable land?

14 A Arable land.

15 Q A-r-a-b-l-e?

16 A That's correct.

17 Q And could you explain to the Court very quickly the
18 difference between arable and irrigable land?

19 A From my standpoint?

20 Q For the purposes of your studies.

21 A Arable is a determination of lands which physically
22 and chemically sustain long-term irrigation.

23 Irrigable are those lands that meet the tests of
24 economics and design and the other portions of the

25 kersich - voir dire - white

1 study that we are talking about.

2 Q So arable is the large base that you begin with and
3 then after the application of engineering and economic
4 determinations it's reduced to irrigable?

5 A Irrigable, that's right.

6 Q Now, I see in Footnote 2 you have the word irrigable.
7 Why is that irrigable rather than arable?

8 A That's a mistake on my part.

9 Q Should that be arable?

10 A That's correct.

11 Q So where the word irrigable appears, both times
12 in Footnote 2, that should be arable, or only on
13 the first time?

14 A Arable.

15 Q Both times?

16 A We are trying to block up lands that can be reviewed
17 for irrigability -- wait a minute. Maybe I misspoke.
18 Could I read that again?

19 Q That's why I asked you about the both times that
20 it appeared.

21 A Well, irrigable at this point might suffice. If
22 you have a small portion of arable land that's
23 located in land that's presently being irrigable
24 or being irrigated or would be irrigated, you may

25 kersich - voir dire - white

1 attach this to it. The final determination would
2 not necessarily be mine in this instance.

3 Q So it would be irrigable rather than arable in
4 Footnote 2?

5 A Yes, to give it the broadest definition of the
6 term, I would say yes.

7 Q And you still use the irrigable concept when you
8 apply Footnote 2 to the irrigation pattern and
9 field size for gravity irrigation for class 3?

10 A We talk about five-acre minimum size there, and
11 if we are adding five acres on to something as
12 a little extension or something, yes, it could be
13 determined. If the other portion is determined
14 irrigable, then we know the land is there and if
15 it's possible to pick it up, it might be picked up.

16 Q So you made irrigability determinations as well as
17 arability determinations?

18 A Not from the standpoint of --

19 Q Or you made irrigability determinations as well
20 as arability determinations in the application of these
21 standards with respect at least to class 3 lands?

22 A Not really from an economic or engineering sense,
23 more from a sense that if we had a large tract
24 of land with a small adjacent piece to it, it may

25 kersich - voir dire - white

1 have been left as arable so that the final
2 determination could be made by the ag engineer
3 and the economist.

4 Q But in order to make Footnote 2 work, you made a
5 determination of irrigability; is that correct?

6 A No, that's not what I said, and I think if -- if
7 you have, as the designer -- let me look at it from
8 the way I would look at it, okay?

9 Q Yes.

10 A If I were designing an engineering project and I
11 had a large block of land here that it turns out
12 to be serviced and if there were some arable lands
13 located contiguous to it that were small, I would
14 look at those then -- I would want to have that
15 knowledge so I could look at those and determine
16 whether they are worthwhile putting a system on,
17 and that's the interpretation that we made to try
18 and assist him in his final determination.

19 Q Let's see if I have it straight then. You made
20 determinations with respect to irrigability only
21 with respect to adjacent lands in order to apply
22 Footnote 2; is that correct?

23 A That's correct.

24 THE SPECIAL MASTER: Do you want to take a
25 kersich - voir dire - white

1 little break?

2 MR. WHITE: I'm just about done, Your Honor,
3 and you may rule on this one.

4 Q (By Mr. White) And as I understand your testimony,
5 you would need to check with Mr. Toedter with
6 respect to whether or not you had drainage requirements
7 for class 4 lands as shown on --

8 A. That's correct.

9 MR. WHITE: Your Honor, we would reserve
10 any objections which we might have until Mr. Kersich
11 is able to talk with Mr. Toedter and find out
12 about the drainage requirements for class 4 lands.

13 THE SPECIAL MASTER: Any other voir dire?

14 MR. ROGERS: None, Your Honor.

15 THE SPECIAL MASTER: Who said that?

16 MR. ROGERS: I did, Your Honor.

17 THE SPECIAL MASTER: All right. With the
18 reservation of the offering, Exhibit WRIR C-36
19 is admitted. I understand there's a reservation
20 for some further inquiry regarding the matters on
21 which the voir dire was conducted.

22 Mr. Echohawk?

23 MR. ECHOHAWK: Would this now be an appropriate
24 time for a break?

25 kersich - voir dire - white

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THE SPECIAL MASTER: All right. If you would like one, we'll have a ten-minute break.

(Thereupon a 10-minute recess was had.)

* * * * *

1 Q (By Mr. Echohawk) (Continued) Mr. Kersich,
2 before we go any further, I think there's
3 some things we need to clear up. In working on
4 this project with the land classification work,
5 is that generally the whole area that you worked
6 on is just the land classification?

7 A Primarily the work I did in this project was
8 involved with land classification, yes.

9 Q What I'm getting at is you or anyone else at HKM
10 did not design the irrigation designs to fit
11 the arable lands, did they?

12 A We have done no irrigation design, no.

13 Q And you've done none of the final economic
14 determination; is that right?

15 A None of the final -- none of the final economic
16 determinations are being done by anyone in our
17 office.

18 Q Okay. Now, also there was a question raised
19 by Mr. White as to the difference between how
20 you all have used the term "irrigable" and
21 "arable". Maybe you could probably clear that
22 up as to how that term has been used in the past
23 by HKM.

24 A Well, those terms sometimes have been used

25 kersich-direct-echohawk

1 interchangeably. What we tried to do on this
2 project to make sure there was a distinction
3 in what we were trying to show and what other people
4 were trying to show was declare that those lands
5 that are capable of sustaining irrigation, subject
6 to further review then by other persons would be
7 called arable lands. Then when the results of
8 the ag, econ and the ag engineering were completed,
9 those lands would be called irrigable lands.

10 Q Mr. Kersich, after the land classification standards
11 were formulated, what would be the next step?

12 A One of the next steps was to develop some kind
13 of symbol or shorthand code that the land
14 classifiers could use to identify the lands in the
15 field and to be able to mark their notes down in
16 a reasonably clear manner.

17 Q Mr. Kersich, I show you what's been marked as
18 United States Exhibit WRIR C-37. Mr. Kersich,
19 I ask you to identify Exhibit C-37, please.

20 A C-37 is entitled Figure 1 the map symbol code,
21 and underneath it it has a numerator and denominator.
22 The numerator defines the class that is put on the
23 land and any soils, topography or drainage
24 deficiencies. And the class, by the way, is for

25 kersich-direct-echohawk

1 both gravity and sprinkler.

2 The denominator gives you the soil types and
3 the top twelve inches and the next three feet.
4 The drainage deficiency, if any, topography, if any,
5 and soil deficiency, if any. This can be used
6 then to identify what the land classifiers saw,
7 what the chemical results are, at least an alert
8 to some chemical problems if they showed up and
9 so on.

10 Q Where are those map symbols used?

11 A They're used in the -- first of all in the field
12 by the person actually classifying the land, and
13 that time he places a preliminary class on the
14 particular tract that he's reviewing. Along with
15 that he notes if there are any deficiencies under
16 either soils, topography or drainage. And then if
17 it's possible for him to ascertain the deficiencies
18 he notes that in the denominator as well as the
19 texture of soil that he's viewed and this is the
20 beginning of the surface of going down up to ten
21 feet, although the textures we refer to here cover
22 basically the top four feet or the root zone.

23 Q Where were the symbols recorded?

24 A They're recorded on the aerial photographs that
25 kersich-direct-echohawk

1 he's using at the time he's classifying the lands.

2 Q Now, in this land classification program field work,
3 can you give us the list of people that were
4 involved in that program from HKM?

5 A Yes. We hired some people that had retired from
6 the Bureau of Reclamation. One of them was
7 Lyle Olson, Reed Hanson. We had Chick Smith from
8 our office, we had Ross Waples from our office.
9 They're full-time employees with us, and another
10 fellow by the name of Richard Oper, who is a
11 soils trainee.

12 Q Mr. Kersich, do you know how much experience in
13 land classification work Mr. Hanson has?

14 A Mr. Hanson has in excess of thirty years of
15 classification experience. He began with the
16 Bureau about thirty some odd years ago.

17 Q That would be the Bureau of Reclamation?

18 A Yes, Bureau of Reclamation.

19 Q And once again, how much experience, land
20 classification experience did Mr. Smith have?

21 A Mr. Smith had twenty-six years with the Bureau,
22 and he's had about four more years with us.

23 Q And how much land classification experience
24 did Mr. Waples have?

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1 A Mr. Waples has one year with the Bureau of
2 Reclamation, and then about four or five years
3 with us, I can't remember exactly.

4 Q How about Mr. Olson?

5 A Mr. Olson has somewhere between thirty-five and
6 forty years of land classification experience.

7 Q Mr. Kersich, when was the field work conducted?

8 A Done over two field seasons. It was done in the
9 late summer and fall of 1978, and then it began
10 sometime in the summer of 1979 and continued
11 through the late fall or early winter of '79,
12 I can't remember exactly.

13 Q Can you give us briefly what was involved in the
14 field program? What type of work did they do?

15 A Basically their work was to take aerial photographs
16 and various equipment -- or that a land classifier
17 takes, go out in the field, go on the tracts,
18 visually observe the tracts, determine rough
19 boundaries of particular areas that they considered
20 to be worth studying. Then they would put down
21 the various auger holes to various depths. They
22 would determine the soils profile from those holes.
23 They put down further probes where the -- they might
24 have a question about whether the land form or the

25 kersich-direct-echohawk

1 land profile, soils profile was the same. In
2 some instances they samples the auger holes that
3 they drilled and samples were sent to the labs
4 then for review and testing. Finally they noted
5 any potential defects or if there was a need
6 further in their finds, further investigations
7 by drainage people, they would note that on there,
8 either their log form or many times with a d which
9 is the symbol for drainage, and that would be on
10 the aerial photograph. Then they would assign
11 a preliminary classification to that particular
12 tract that they were on at that time.

13 Q Mr. Kersich, what was the level of detail of the
14 land classification study?

15 A We call it modified semi-detailed study.

16 Q What does that mean?

17 A There are three levels of classification intensity
18 that the Bureau of Reclamation uses, and just
19 for simplicity is it all right if I just call
20 it Bureau instead of talking about WPRS because
21 they were the Bureau at the time we were working.

22 THE SPECIAL MASTER: You're testifying.

23 THE WITNESS: Sure, okay. And those
24 are reconnaissance and the semi-detailed and

25 kersich-direct-echohawk

1 detailed. We tried to get to the semi-detailed
2 level of intensity. Each of them by their name
3 has a little more work involved in doing, in
4 field work, a little more lab work for the type
5 of level of investigation. Semi-detailed is
6 described in the Bureau manual, I don't recall
7 all the different definitions, but they require
8 so many holes be drilled and that the traverse
9 that the land classifier makes is spaced about
10 a half a mile apart. There's a certain scale
11 of mapping, and one of the reasons we called
12 ours modified is that the scale of maps or
13 aerial photographs that we were able to obtain
14 to do this project were different than what the
15 Bureau would call for. Semi-detailed, they, I
16 believe they use five inches to the mile and we
17 were only able to obtain four inches to the mile
18 photographs at that time.

19 So a semi-detailed is a relatively high
20 level of intensity, more than a reconnaissance
21 but still not as much, as much information is
22 gathered under a detailed study. A detailed
23 study, from the Bureau, from my understanding,
24 are normally used for definite planned reports,

25 kersich-direct-echohawk

1 Q Mr. Kersich, you mentioned that when the land
2 classifiers were in the field they would record
3 certain information on the aerial photos.

4 A That's correct.

5 Q Would they also record information elsewhere?

6 A Yes. They were furnished log forms, and these
7 log forms they would put down the soils profile
8 that they had examined, the results of their
9 examination, the position of the tract with
10 regards to where it sits on a terrace or where
11 it sits on a creek bottom, river bottom, things
12 of this nature, any potential problems they may
13 have for surface and subsurface drainage both.
14 There's a field test they conducted to determine
15 texture that gives them some idea of the amount
16 of clay that might be present which might alert
17 them to drainage problems.

18 They record the color of the soil. All this
19 information is placed on a log form.

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kersich-direct-echohawk

1 Q (By Mr. Echohawk) Mr. Kersich, I show you what's
2 been marked as United States Exhibit C-38. Would
3 you describe that exhibit for us?

4 A WRIR Exhibit C-38 is a soil texture triangle that
5 was used by the land classifiers to determine
6 textures, and it's a graphic representation of
7 the different sizes of particles that may be located
8 in a soils matrix, and it's a method of identifying
9 those soils by common names, the development, its
10 origin and source, what was -- it was developed
11 by the United States Department of Agriculture
12 for us in this type of work, any type of soils
13 work.

14 Q So whenever we are referring to the various textures
15 such as sand or loamy sand, that information is
16 basically derived from the soils triangle?

17 A Well, if you know the percentages of soil in the
18 sample that you are considering, know the percentage
19 of silt, know the percentage of clay, you could
20 locate your triangle and determine textural
21 classification, yes.

22 Q Mr. Kersich, I show you what's been marked as
23 United States Exhibit C-39. Will you please
24 describe for us what that exhibit is?

25 kersich - direct - echohawk

1 A. Yes, Exhibit C-39 is a composite of a number of
 2 aerial photographs put together into one township,
 3 and this particular township happens to be Township
 4 4 North Range 2 West, the unit -- this particular
 5 township is located in the North Crow Heart Unit,
 6 and on there there is certain information that was
 7 put on by the land classifier.

8 The legend is supplied on the lower right-hand
 9 corner of that particular exhibit that explains what
 10 some of the marks are, what the notations are on
 11 each particular section within that township.

12 Q. The particular markings on the aerial photographs
 13 were put on there by whom?

14 A. The land classifier.

15 Q. Mr. Kersich, I show you what's been marked
 16 United States Exhibit C-40. Would you please
 17 describe for us what that is?

18 A. Exhibit 40 is a copy of one of our log sheets,
 19 and this particular log sheet relates to Section
 20 13, Township 4 North, Range 2 West, and so you could
 21 find the location of this hole by examining
 22 C-39.

23 THE SPECIAL MASTER: You said "find this hole,"
 24 did you say?

25 kersich - direct - echohawk

1 THE WITNESS: Yes, this is a log of a hole
2 that was drilled by Mr. Olson in Section 13,
3 Township 4 North, Range 2 West, sir.

4 Do you want me to locate that on there?

5 Q (By Mr. Echohawk) Which is depicted on United
6 States Exhibit C-39?

7 A That's correct.

8 Q Yes, if you want to explain where that is on there.

9 A Okay. This hole -- this is Section 13. The
10 location of the hole in the field is found up here
11 (indicating), and it shows a number 4, and it's
12 circled by two small circles.

13 If you look at the legend, that indicates
14 that that's a log that was made by one of the HKM
15 classifiers, and that particular sample was -- and
16 that particular hole was sampled. In other words,
17 samples were taken - and sent to the lab for
18 analysis.

19 THE SPECIAL MASTER: How many holes per township
20 were made like this?

21 THE WITNESS: I don't have the record per'
22 township right here with me, sir. I do have -- we
23 drilled a total of 671 holes. We had 357 holes
24 which were five feet or less, 197 which were five
25 kersich - direct - echohawk

1 to ten feet, and then we had 117 holes which were
2 33 feet or less.

3 A. (By the Witness) Then the information that the
4 land classifier developed in the field was put on
5 here. One of the first things he was concerned
6 about was slope, so he made a note here that the
7 slope of this particular parcel went from three
8 to seven percent, was a predominant gradient, but
9 some was under.

10 To give you some idea what the surface was,
11 it was gently undulating and rolling. There was
12 alluvium and alluvial sand at the foot of a slope.
13 The surface drainage was medium.

14 In other words, there was some surface drainage
15 there, no particular problems.

16 Those surface fragments weren't of any concern
17 so we didn't show anything about that. The present
18 land use was sagebrush and grasses.

19 Then, as I said, he drilled the hole, and as he
20 went through different textures, he would assign a
21 depth of that particular texture so that he had --

22 THE SPECIAL MASTER: Was that a pounding well
23 or a drilling rig or rotary --

24 THE WITNESS: This is a hand auger, a land

25 kersich - direct - echohawk

1 classifier's auger. It's about eight inches in
2 height, as I recall. It has a six-foot rod, and
3 you muscle power it down.

4 A. (By the Witness) All right, so then this particular
5 hole he logged to 60 inches, and he had loam from
6 zero to eleven inches. He had fine sandy loams
7 from eleven to 24 inches. From 24 to 40 inches,
8 he had fine sandy loam, and from 40 to 60 inches
9 he had fine sandy loam.

10 There were some changes in the colors, and
11 these colors would be used primarily, from my
12 standpoint at least, to determine if we had any
13 potential drainage problems there.

14 He analyzed the structure of the soil, how
15 the soil was aggregated, and in this particular
16 instance it was in the first -- for example, in
17 the first eleven inches, it was weak structured
18 granular to platy. The consistency of the soil
19 when wet -- he takes a small sample in sand, and
20 he wets it down to determine the consistency of
21 the soil and the texture, and the consistency was
22 nonplastic, and it was slightly sticky.

23 In other words, it didn't have very much
24 in it from his standpoint.

25 kersich - direct - echohawk

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The lime efflorescence he determines by taking a ten percent solution of hydrochloric acid, dropping some on the soil sample and seeing how it burns it or effloresces.

From his standpoint, the surface permeability was slower although he had slowed to -- and I don't get what the next number should be here.

* * * * *

kersich - direct - echohawk

1 A (Continued) On the lower left-hand corner he
2 had sample numbers that were assigned or put on
3 the sample sacks; the soils are put in sacks for
4 identification for lab work. The lab work -- it
5 was worked up in the lab and then the results
6 of that lab work are reported on this log here
7 on the lower -- on the left-hand side of the
8 sheet and in this first 11 inches, for example, the
9 soil had a ph of 8.6 under a one to five dilution
10 we call it, and 7.8 under a calcium chloride
11 solution. This is just two different ways of
12 determining the ph of the soil or the acidity
13 of the soil. Settling volumes which are used to
14 determine amount of sodium that might be present
15 to give you problems were indicated underneath
16 the ph's and so, for example, in the first 11
17 inches that particular sample of soil had a
18 settling volume of 21.

19 The electroconductivity, which is a test of
20 the salts that might be present in the soil, are
21 reported on the right-hand side of the log. If
22 you go down, there was just a trace of salt in
23 the upper zones. As we get into it, more salts were
24 present. Then what they call a sodium absorption

25 kersich-direct-echohawk

1 ratio test was run to determine the ratio of
2 sodium to magnesium and calcium and what potential
3 problems, if any, might result there.

4 THE SPECIAL MASTER: Is that what the figure
5 4.3 on the bottom --

6 THE WITNESS: That's correct, that's the
7 sodium absorption ratio, yes.

8 Q (By Mr. Echohawk) Mr. Kersich, is the standard
9 soil profile log used by H.K.M. in their various
10 land classification work?

11 A Yes, it is.

12 Q Were these type of logs filled out on all holes
13 drilled on the Reservation?

14 A No. As I said before, in some instances probes
15 were made to just ascertain that the information
16 that had been collected on the log was similar
17 and that there had been no change, no large change
18 in soil profile or any of this type of thing.

19 Q And were all these soil profile logs subsequently
20 sent on to the agricultural engineer that designed
21 the irrigation system?

22 A Copies of these profiles and township maps that
23 are on Exhibit C-39 were sent to the agricultural
24 engineer.

25 kersich-direct-echohawk

1 Q Mr. Kersich, were any infiltration tests run of
2 the various lands within the six study areas?

3 A Yes, we made 11 infiltration tests and there were --
4 an infiltration test, if I might define it, is a
5 test made to determine the capability of the
6 surface soils to absorb water. That's information
7 the Ag engineer needs.

8 Q What, were the results of those tests then sent
9 onto the agricultural engineer?

10 A Yes, they were.

11 Q Okay, you mentioned in, I think it is, the third
12 section of this land classification standard that
13 deals with the topic of drainage; was specific
14 work done by H.K.M. concerning drainage?

15 A Yes, we had a specific program that was developed
16 to give us answers as to the problems with internal
17 drainage, and let me differentiate at this point,
18 that when I'm talking about drainage there are
19 two types of drainage and we've got the surface
20 drainage, the lay of the land type of things,
21 things of this nature and then we've got to worry
22 about the internal drainage, the problem with the
23 soil getting -- soil profile getting full of water.
24 And for what I'll be describing now, will be the

25 kersich-direct-echohawk

1 internal drainage.

2 Q Okay. Now the drainage work done by H.K.M. is
3 just -- is that merely an input into the land
4 classification standard?

5 A Yes.

6 Q H.K.M. did not design any actual drainage systems,
7 did they?

8 A No.

9 Q Could you describe for us what type of work went
10 into this, into the drainage considerations?

11 A Basically what we wanted to do was to determine
12 what the hydraulic conductivity of the soils were
13 and what the depth to barrier is. And depending
14 on information given to us by the land classifier,
15 the drainage engineer went out in the field and
16 drilled various areas to determine where a barrier
17 might be. And now when we talk about barrier, we
18 are not talking about just a rock formation, we
19 are talking about something which may have a
20 hydraulic conductivity one-tenth or less of the
21 weighted average of the soils above it. So if you
22 were to, in a soils profile for example, have a
23 sand, sandy loams or loamy sands, then all of a
24 sudden come upon a clay layer or a loamy -- or a

25 kersich-direct-echohawk

1 clayey loam and find though that's it's hydraulic
2 conductivity was less than one-tenth or less than
3 the materials above, we consider that a barrier,
4 it inhibited the flow of water.

5 So he did two things then, he drilled holes
6 some as I said were land classification estimates,
7 some were his review of the geological maps of
8 areas that indicated there may be some problems,
9 and some based on his own knowledge of land forms
10 on this type of work to try to determine where
11 the barrier was.

12 Now, he didn't get to barrier at all times,
13 sometimes he got to barrier very quick. In other
14 words, he found there were sandstone barriers,
15 things of this nature which occurred and created
16 a serious problem. Then the other thing that he
17 did along with this, he logged each hole. Each
18 one of these holes was logged and they were
19 drilled by the way, with a power auger. We are
20 talking about a different drilling f-

21 THE SPECIAL MASTER: A power auger or a power
22 drill?

23 THE WITNESS: Power drill. We refer to them
24 as an auger because they are auger-type drills.

25 kersich-direct-echohawk

1 A But anyway. They were all logged and he determined
2 the textures that might be potential problems
3 for him. Later on we went back and tested a
4 number of different soils textures for hydraulic
5 conductivities and, I believe, we ran 22 hydraulic
6 conductivity tests and that test is a field test
7 where you drill the hole, you isolate the particular
8 zone that you're concerned about and then you put
9 water in the hole because in this particular
10 project we didn't have, as I recall, I don't recall
11 one log that we had a groundwater problem. In
12 other words, there isn't any groundwater out there
13 within the distance we were checking. So then the
14 hydraulic conductivity tests were taken and
15 certain hydraulic conductivities were assigned to
16 various soils classifications.

17 Q Soils classifications?

18 A I mean soils textures. One thing, each of the
19 holes where we textured, as I recall, we did a
20 mechanical analysis to confirm the textures.

21 Q Now, was there any drain spacing analysis run?

22 A Yes, and --

23 Q And why was that necessary?

24 A Well, earlier I testified about there were three
25 kersich-direct-echohawk

1 things we were concerned about with drainage:
2 Number one we were concerned about depth to
3 barrier, the hydraulic conductivity and the
4 potential spacing of drains and the drain spacing
5 is primarily an economic factor. So for these
6 specifications we used a minimum drain spacing
7 of 200 feet. In other words, if our log or our
8 studies of an area indicated that we had a
9 hydraulic conductivity fairly low, a depth to
10 barrier where the barrier was fairly high, then
11 we would need drain spaces closer than 200 feet.
12 Then we threw that land out as potentially arable.
13 It wasn't given any further consideration then.

14 THE SPECIAL MASTER: You threw it out because
15 it was not potentially arable?

16 THE WITNESS: Oh, let me -- may I say that --

17 THE SPECIAL MASTER: You just said we threw
18 it out as potentially arable.

19 THE WITNESS: Yes, we didn't consider it any
20 further as far as arability. It was not arable.

21 THE SPECIAL MASTER: Very good.

22 Q (By Mr. Echohawk) Now, Mr. Kersich, does that
23 cover generally all of the work done in the
24 drainage portion of the land classification?

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1 A Other than the work that would have been done
2 in the office where these results would have
3 been then plotted against the various land
4 classifications to see whether drainage was indeed
5 a problem, and if it was the classification may
6 have been changed.

7 Q You mentioned that previously, that certain soils
8 were sent to the laboratory for work on certain
9 samples. Could you please briefly describe for
10 us the testing program?

11 A Okay. We have five basic tests that we used in
12 this endeavor. Number 1, we were concerned about
13 the ph or the acidity of the soil, whether it is
14 acid or basic, and Number 2 we were concerned
15 about the electroconductivity which was a test
16 of the salts that were present. Number 3, we
17 had what I call sodium absorption ratio, we
18 determined a ratio of those salts, you make a
19 ratio of the sodium versus the calcium and mag-
20 nesium and that will give you some idea of the
21 permeability problems you may get into. The
22 forth test -- that is the forth one, I believe,
23 was settling volumes and this is a test that is
24 used to determine the amount of fines and the

25 kersich-direct-echohawk

1 dispersable sodium that you might have present
 2 in a soil matrix and a final test that we did,
 3 a mechanical analysis which determined the
 4 particle size of the matrix and what texture it
 5 is actually.

6 Q Mr. Kersich, where were the laboratory tests run?

7 A They were run in our own laboratory in ~~Billings~~.

8 Q Would you, in your opinion, say that that's a
 9 reliable lab?

10 A Yes.

11 Q And how do you know that?

12 A Well, one of the things we do to -- I had some --
 13 this project, I ran some samples, I took samples
 14 from the samples that we kept -- we keep all of
 15 those samples until the project is completed. So
 16 we randomly selected some samples and I had them
 17 retested and basically it is just quality control.

18 Q Mr. Kersich, were the results of the laboratory
 19 tests sent to the agricultural engineer?

20 A Yes, and they were also placed on the log book
 21 that I described previously.

22 Q Mr. Kersich, now let's see, we have accumulated
 23 the field data for the land classification, the
 24 drainage information, and the laboratory tests.

25 kersich-direct-echohawk

1 what was done with all of this information?
2 A Basically, the first place the information went
3 was to the land classifier to Chick Smith, as
4 Chick served as our chief of party on this
5 particular project, and then a review was made of
6 the particular classifications that person had
7 placed on tracts predicated on all of the other
8 information that had been developed. At that
9 point in time, changes may have been made in
10 boundaries or lands classed -- the land class may
11 have went up, it may have went down, or it may
12 have went to nonarable.. This was all put on these
13 particular -- it was put on the photographs and
14 these township plats that I referred to previously.
15 After that, then the results were as I said, mapped
16 and tabulated. We planimetered the various tracts
17 and then tabulated the class 1, 2, 3, 4, soils
18 and then finally there was additional reviews that
19 were ongoing through the summer of '80 and this
20 fall, where we went out and checked some of the
21 results of the land classifier's work and reviewed
22 the maps and tried to make sure that the maps,
23 that the information we had collected represented
24 the information that was out in the field.

25 kersich-direct-echohawk

1 Q And were you personally involved in any of the
2 review process?

3 A Yes, I was.

4 Q And how so?

5 A Well, I went through all of the logs, I went
6 through the maps, I went out in the field with, in
7 this particular instance, Ross Waples because
8 Chick was having some other problems and I even
9 put down a half dozen or so probes myself to see
10 whether the information was accurately represented
11 on the logs.

12 Q And what was done with the information once the
13 land classification was finally arrived at?

14 A Well, basically we arrived at what is a final
15 concensus of everyone's opinion on these various
16 tracts, a final classification was established
17 and that information then in final form, was all
18 put together and sent to the agricultural
19 engineer for work in his designs.

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21 END

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1 MR. ECHOHAWK: Your Honor, could we take a
2 brief recess so I could get two larger maps?

3 THE SPECIAL MASTER: Very well.

4 MR. ECHOHAWK: They're just out in the hallway.

5 (Thereupon a five-minute
6 recess was taken.)

7 THE SPECIAL MASTER: Proceed.

8 Q. (By Mr. Echohawk) Mr. Kersich, I direct your
9 attention to the large maps leaning against the
10 wall there. I think those are United States
11 Exhibit WRIR C-41 and 42. Would you please
12 describe those exhibits for us.

13 A. WRIR C-41 is an exhibit entitled Arable Sprinkler
14 Lands in Selected Study Areas. What's depicted
15 on this particular exhibit is the outline of the
16 Reservation, the outline of the study areas, the
17 lands that were found to be arable within each study
18 area predicated on sprinkler irrigation and the
19 classification of the various tracts of lands.
20 The classification can be determined by looking at
21 the legend in the lower left-hand corner where
22 Class 1 lands are depicted in yellow, Class 2 lands
23 are green, Class 3 lands are in blue and Class 4
24 lands are in brown.

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1 WRIR Exhibit C-42 is entitled Arable Gravity
2 Lands in Selected Study Areas, and basically they
3 portray lands that were found arable under gravity
4 methods of irrigation in each study area.

5 THE SPECIAL MASTER: Would you distinguish for
6 me on each two of these exhibits, distinguish what
7 constitutes a piece of land that you determine is
8 arable on C-41 that's sprinkler land and make it
9 different from that land that was classified as
10 arable land on the gravity exhibit 42.

11 THE WITNESS: Okay, sir. One -- they were
12 classified under two sets of standards, there were
13 a dual set of standards. And the standards for
14 sprinkler irrigation, for example, in the slope are
15 more relaxed, it's easier to irrigate deeper lands
16 with sprinkler systems than it is with a gravity
17 system, and consequently lands were found arable
18 in many instances under sprinkler irrigation that
19 were not arable under gravity irrigation because
20 they might have been too steep.

21 Now, to put this in relationship, as I recall,
22 without looking at the standards directly under
23 gravity, I believe we could go only up to about
24 an eight percent slope maximum. Let me check that
25 kersich - direct - echohawk

1 if I might.

2 That's correct. Class 3 and 4 lands we had
3 a maximum slope of eight percent. Under sprinkler
4 application we had a maximum percentage of 20 percent
5 under those lands. So let's say that the soil
6 characteristics were reasonable, there were no
7 chemical problems, there were no drainage problems.
8 The only difference was the slope of the ground, if
9 it exceeded eight percent it may have met the
10 sprinkler classification.

11 THE SPECIAL MASTER: Did you input from other
12 specialists, bear on whether or not there was any
13 water under the lands that you think are sprinkler
14 arable?

15 THE WITNESS: No, sir, not at this time.

16 THE SPECIAL MASTER: It doesn't do very much
17 for strengthening your exhibits, in my opinion.

18 THE WITNESS: These are two different questions.

19 THE SPECIAL MASTER: I appreciate that.

20 Q (By Mr. Echohawk) Mr. Kersich, perhaps we should
21 clear up this point.

22 A. Okay.

23 Q Now, in the land classifications that are reflected
24 on exhibits, I think they are 41 and 42, your

25 kersich - direct - echohawk

- 1 determination of arable lands based on sprinkler
 2 standards, now, is that land classification only?
 3 A. That's land classification only, that's correct.
 4 Q. And as far as a subsequent determination of
 5 irrigability that is to be made on certain parcels,
 6 that was not done by you, was it?
 7 A. That's correct.
 8 Q. And such things as method of obtaining water or
 9 getting water to the land was information or a
 10 topic addressed by an additional expert for the
 11 United States?
 12 A. That's correct. Water availability, method of
 13 application, things of this nature are addressed
 14 by others.
 15 Q. So it's only whether or not the lands will support
 16 or sustain long-term irrigation?
 17 A. That's the question here, yes. This is the answer
 18 to the question.
 19 Q. Is that the only thing that you address on your
 20 arables -- arability determination?
 21 A. Within the study areas, that's correct, yes. We
 22 established study areas, that's correct.
 23 Q. Mr. Kersich, have you prepared a report as a
 24 result of the land classification work done on
 25 kersich - direct - echohawk

1 the six study areas that we've discussed today?

2 A. Yes, I have.

3 Q Mr. Kersich, I think you have a copy of United
4 States Exhibit C-43.

5 A. Yes, I do.

6 Q Would you please identify that for us.

7 A. This is a report entitled Land Classification of
8 North Crow Heart Unit, South Crow Heart Unit,
9 Big Horn Flats Unit, Riverton East Unit, Owl
10 Creek Unit and Arapahoe Unit. And it's the
11 report of the work that we accomplished, the
12 description of the methodology and the tabulation
13 of the results.

14 Q Mr. Kersich, does land classification that's
15 reflected within this report, Exhibit C-43 and
16 on the maps contained therein, is this land
17 classification work only on undeveloped lands?

18 A. This is correct. This study only covers those
19 lands which are trust lands and have not been
20 irrigated or are not being irrigated. These lands
21 are basically in raw range form at this time.

22 Q Mr. Kersich, do you know whether or not later on
23 in this trial testimony will be presented regarding
24 land classification of areas that have been

25 kersich - direct - echohawk

1 irrigated in the past?

2 A. There will be, yes.

3 Q. So there will be additional land classification
4 information presented?

5 A. That's correct.

6 Q. Mr. Kersich, I direct your attention to Exhibit,
7 United States Exhibit C-43. I believe there's two
8 tables located near the back that would be found on
9 page 26 and 27, I think.

10 MR. WHITE: Your Honor, I would object to the
11 witness testifying from the exhibit until it's been
12 offered and admitted. If he is doing it just to
13 identify what it is, I have no objection.

14 THE SPECIAL MASTER: Let's hear what the
15 question is going to be.

16 Q. (By Mr. Echohawk) Mr. Kersich, would you please
17 indicate what information is reflected on Table 7
18 found on page 26?

19 THE SPECIAL MASTER: Go ahead.

20 THE WITNESS: Okay?

21 THE SPECIAL MASTER: Yes, he can tell us what
22 he thinks it is.

23 THE WITNESS: All right. This exhibit or this
24 table is called or defined as arable lands by class,

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1 and there are two methods that we identify classes.

2 THE SPECIAL MASTER: You can't go into
3 methodology -- you can tell what it is -- until we
4 get it admitted.

5 THE WITNESS: All right, sir.

6 THE SPECIAL MASTER: Just tell what it is like
7 you were asked.

8 THE WITNESS: And it shows the total that we
9 found in the various classes under each system of
10 irrigation.

11 Q (By Mr. Echohawk) That would be sprinkler and
12 gravity?

13 A. Sprinkler and gravity, that's correct.

14 Q And that shows the total for each method?

15 A. It shows a total by unit and then eventually
16 the total for each method, yes.

17 Q And I direct your attention to table 8 found on
18 page 27. Would you tell us what is found on that
19 table.

20 A. Okay. On Table 8, it's entitled Summary of Arable
21 Lands by Class. It's broken down into gravity systems,
22 additional sprinkler and total arables.

23 Now, additional sprinkler are those lands
24 which we have found to be, that weren't covered by

25 kersich - direct - echohawk

1 any gravity system but could be irrigated by
 2 sprinkler system. So -- And then the final right-
 3 hand columns are the total arable lands by class
 4 by unit and eventually we come to a total of arable
 5 lands of all the units that we were considering
 6 under this study.

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1 Q (By Mr. Echohawk) Within Table 7 and 8, do those
2 reflect the acreage results of your land
3 classification studies?

4 MR. WHITE: Objection, Your Honor.
5 Testifying from the exhibit, not telling what it is.

6 THE SPECIAL MASTER: Well, is there
7 a column on these exhibits regarding total acreage?

8 THE WITNESS: Yes, there are.

9 THE SPECIAL MASTER: All right. What
10 they contained is --

11 Q (By Mr. Echohawk) Mr. Kersich, found in the back
12 of the report I believe are a series of maps; is
13 that correct?

14 A That's correct.

15 Q And what type of maps are those?

16 A These maps are smaller versions of the various
17 exhibits we have been discussing.

18 We have a map, for example, of the North
19 Crowheart Unit that shows the locations of the
20 class of lands within that unit under gravity
21 land classification. We would have a similar
22 map that would show the location and the various
23 classes we put on the land for the sprinkler
24 classification system for the North Crowheart

25 kersich-direct-echohawk

1 Unit, and then we can go through each one of
2 the units that are described on the large exhibits
3 and a copy of what appears on that appears in
4 scale here showing the location of the lands
5 within the unit and the classification of those
6 particular lands.

7 Q And this information is broken down by particular
8 study area such as the North Crowheart Unit?

9 A That's correct. They are by study area and by
10 both gravity --- there's a map for gravity and a
11 map for sprinkler system classification.

12 Q Mr. Kersich, I direct your attention to United
13 States Exhibit C-44. Would you please describe
14 for us what this exhibit is?

15 A C-44 is a depiction of the North Crowheart area,
16 gravity land classification map. It is basically
17 a large scale blowup of the information that would
18 appear on C-42, which is entitled, "Arable Gravity
19 Lands(In Selected Study Areas)."

20 This is taking the North Crowheart area out
21 by itself. It's locating the arable lands on that
22 map and then breaking down the arable lands by the
23 various classes that were placed upon it, 1, 2, 3,
24 or 4.

25 kersich-direct-echohawk

1 THE SPECIAL MASTER: You say 1, 2, 3, or
2 4 in classes. I see that the yellow is Class 1;
3 is that right?

4 THE WITNESS: Yes.

5 THE SPECIAL MASTER: And the green is
6 Class 2; is that right?

7 THE WITNESS: That's correct.

8 THE SPECIAL MASTER: Those that you have
9 painted in as blue you call Class 3; is that right?

10 THE WITNESS: That's right, sir.

11 THE SPECIAL MASTER: Show me some Class 4
12 on that map. You are going to have to have a
13 magnifying glass? Now, you are going to go up
14 and point to some minute sections right here?

15 THE WITNESS: No sir, just this one
16 right here (indicating).

17 THE SPECIAL MASTER: Would you call that
18 a minute section?

19 THE WITNESS: Yes sir, but it wasn't here
20 and there.

21 THE SPECIAL MASTER: What is the percentage
22 of that land to the rest of the land --

23 THE WITNESS: There's six acres there
24 that is Class 4.

25 kersich-direct-echohawk

1 THE SPECIAL MASTER: What is the total
2 acreage on that exhibit, 46,649? Six of which is
3 4, and you give it the benefit of a separate
4 classification and put it on the map?

5 THE WITNESS: We weren't sure where
6 this particular boundary was at the time we
7 were out classifying lands and at the time there
8 was a large block of --

9 THE SPECIAL MASTER: I don't care for
10 your classifications. The exhibit speaks for itself.

11 Q (By Mr. Echohawk) Mr. Kersich, Exhibit C-44, is
12 that merely an enlargement of the individual map
13 contained in the back of the report?

14 A That's correct.

15 Q And similar maps have been prepared on this same
16 scale; is that correct?

17 A Similar maps have been prepared for each unit, yes.

18 Q And for gravity and sprinkler?

19 A And for gravity and for sprinkler.

20 Q Now, Mr. Kersich, before we offer United States
21 Exhibit C-43 into evidence, I direct your attention
22 to I believe it's Page 22. Do you have a correction
23 to be made on Page C-22?

24 A Yes, I do. At the top of the page in the second
25 kersich-direct-echohawk

- 1 line there's a figure of 84,579 undeveloped acres.
2 That figure should be corrected to 84,469.
- 3 Q Mr. Kersich, in the past couple of weeks have
4 you conducted a final review process of the
5 maps and the areas that were classified --
- 6 A Yes, I have.
- 7 Q And were certain corrections to those maps and
8 classifications given to the State of Wyoming?
- 9 A To the best of my knowledge, they were, yes.
- 10 Q Now, is there one additional correction that was
11 probably not given to the State of Wyoming?
- 12 A That's correct.
- 13 Q And is that in the Arapahoe Unit?
- 14 A That's in the Arapahoe Unit.
- 15 Q Could you please tell us what that correction is
16 and point out where it is?
- 17 A Okay. In the review process we found one piece
18 of land that had been included as arable of 110
19 acres, and in my determination, it was not arable
20 and, therefore, we changed the totals to reflect
21 110 acres less in that particular unit and removed
22 that parcel from our maps and our exhibits.
- 23 Q Mr. Kersich, then each of the maps prepared,
24 by HKM reflecting the overall reservation and each
25 kersich-direct-echohawk

1 individual unit, do they reflect the acreages and
2 the classifications for each?

3 A Well, at the scale we are working, they are as
4 close as possible to the actual acreages, yes.

5 Q Are these acreage figures accurate to the best
6 of your knowledge?

7 A To the best of my knowledge, they are, yes.

8 Q Do they reflect the land classifications done by
9 the people at HKM Associates working under you?

10 A Yes, they do.

11 Q Do these maps and tables reflect your professional
12 opinion regarding arable lands depicted thereon?

13 A Yes, they do.

14 MR. ECHOHAWK: Your Honor, I move United
15 States Exhibits 34, 35, 37, 38, 39, 40, 41, 42, 43,
16 44, 45, 46, 47, 48, 49, 50, 51, --

17 THE SPECIAL MASTER: You lost me after
18 44. I haven't seen 45, 46, 47, and 51 yet.

19 MR. ECHOHAWK: Excuse me. My mistake.

20 THE SPECIAL MASTER: I would kind of like
21 to make sure we have got what we have. Why don't
22 you go back to the beginning, Tom, and I'll drop
23 each one as you talk about it? It began with 34.

24 MR. ECHOHAWK: 34 would be the resume.

25 kersich-direct-echohawk

1 THE SPECIAL MASTER: Okay. 34.

2 MR. ECHOHAWK: And 35 would be the map
3 entitled, "Study Area Land Base," the large map
4 that was --

5 THE SPECIAL MASTER: That's behind there?

6 MR. ECHOHAWK: That's right.

7 THE SPECIAL MASTER: All right. Exhibit 35.

8 MR. ECHOHAWK: I believe 36 was admitted.

9 THE SPECIAL MASTER: 36 was the three-page
10 land classification study, and that was admitted.

11 MR. WHITE: I think it was admitted subject
12 to some reservation.

13 THE SPECIAL MASTER: Okay, two items in
14 it, okay.

15 MR. ECHOHAWK: 37 would be the single sheet
16 showing the map symbols.

17 THE SPECIAL MASTER: The map symbol code.

18 MR. ECHOHAWK: 38 would be the soil
19 triangle. 39 would be the composite aerial
20 photograph.

21 THE SPECIAL MASTER: Yes. You don't
22 have copies of these except as they are contained
23 in the jacket of 43; is that right?

24 MR. ECHOHAWK: That's right.

25 kersich-direct-echohawk

1 THE SPECIAL MASTER: Okay, Tom. Go
2 ahead.

3 MR. ECHOHAWK: Exhibit 40 would be the
4 individual soil log.

5 THE SPECIAL MASTER: All right.

6 MR. ECHOHAWK: Exhibit 41 would be the
7 large map there leaning against the wall entitled,
8 "Arable Sprinkler Lands, Selected Study Areas."

9 THE SPECIAL MASTER: 41 and 42. I see
10 42 is arable gravity lands.

11 MR. ECHOHAWK: Right, Exhibit 43 would
12 be the report entitled, "Land Classification of
13 North Crowheart Area, South Crowheart Area, Big
14 Horn Flats, Riverton East, Owl Creek, and Arapahoe
15 Units." And then Exhibit 44 that we identified
16 is the large individual map of the North Crowheart
17 gravity.

18 THE SPECIAL MASTER: Okay. That's all
19 that's been offered so far and identified.

20 Do you want the voir dire now?

21 MR. ECHOHAWK: What I need to do is we
22 prepared individual exhibits such as this that
23 have been numbered in sequence for each of the
24 individual units for gravity and for sprinkler,

25 kersich-direct-echohawk

1 and those are the same maps that are found in the
2 back of Exhibit 43. Did you want me to go through
3 each one of those?

4 THE SPECIAL MASTER: Do you want to offer
5 those now in evidence?

6 MR. ECHOHAWK: Yes, I do.

7 THE SPECIAL MASTER: Proceed. We'll have
8 a --

9 MR. ECHOHAWK: Do you want me to identify
10 each particular --

11 THE SPECIAL MASTER: I would like you
12 to identify anything beyond 44.

13 MR. ECHOHAWK: All right. Exhibit 45
14 would be --

15 THE SPECIAL MASTER: And I would like
16 to see it.

17 MR. ECHOHAWK: All right.

18 MR. WHITE: I think the witness ought
19 to identify the exhibit if it's going to come in
20 through him.

21 THE SPECIAL MASTER: I suppose he will
22 if we give him a chance, but you're right.

23 Q (By Mr. Echohawk) Mr. Kersich, would you identify
24 Exhibit 45 for us, please?

25 kersich-direct-echohawk

1 A Exhibit 45 is the North Crowheart area, sprinkler
2 land classification map, and depicted on that is
3 the boundaries of the North Crowheart study area
4 and located within that map are various tracts
5 of land that we classified and assigned a
6 classification to.

7 The same legend is on this map that is on the
8 others. The same color designation of each class
9 of land is the same as on the others and the only
10 difference is that this is the result of the
11 sprinkler land classification program and the
12 previous exhibit, 44, was the result under the
13 gravity land classification program.

14 THE SPECIAL MASTER: Once again, I think
15 I can comment on the fact you are in a rut. Once
16 again, you end up in Class 4 where you still have
17 six acres out of a total of 44, 382 acres.

18 Why do you bother with a classification of 4?

19 THE WITNESS: Well, sir, engineers are
20 precise, and I assumed that when we go out and
21 do something, if we found it, we report it.

22 THE SPECIAL MASTER: Engineers are precise,
23 but land is land, and there's massive amounts and
24 also textures, and you are testifying as an expert

25 kersich-direct-echohawk

1 that there are 2,555 acres of land that fit the
2 definition and the criteria of Class 3 land as
3 you have described what it is in your exhibits and
4 you offered for evidence?

5 THE WITNESS: Yes.

6 THE SPECIAL MASTER: And yet you insist
7 that none of that could be Class 4 lands under
8 your class for distinction? You want reasonable
9 men to believe that?

10 THE WITNESS: That's the results of the
11 work that we did in the field, sir.

12 THE SPECIAL MASTER: Okay. I hear what
13 you say. Go ahead.

14 MR. ECHOHAWK: May we have Exhibit 46?

15 THE SPECIAL MASTER: Reasonable men
16 and women, since this is a society -- take that
17 out, please. We have enough troubles in the record.

18 A (The Witness) This map is entitled, "South Crowheart
19 Area, Gravity Land Classification Map." It depicts
20 the South Crowheart study area, and located within
21 that study area it shows the location of tracts
22 that are irrigable, and again the land is classified
23 as 1, 2, 3, or 4. The same color scheme is used
24 to denote the various classes of land on the legend

25 kersich-direct-echohawk

1 and within the tracts.

2 Q (By Mr. Echohawk) And this is Exhibit C-46?

3 A Right, it's entitled C-46, WRIR C-46.

4 MR. ECHOHAWK: Could we have Exhibit C-47?

5 A (The Witness) This is a map that -- this exhibit
6 is entitled WRIR C-47. It's the South Crowheart
7 area and it depicts the lands that were classified
8 in the sprinkler classification system -- basically,
9 it depicts the same as the other map or the other
10 exhibit, the previous exhibit. It shows the study
11 area outlined, and it shows the lands that were
12 deemed arable under the sprinkler land classification
13 system, and those lands are colored by the class
14 that was assigned to the lands.

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1 Q Could we have Exhibit C-48? Would you please
2 describe our exhibit for us?

3 A Exhibit C-48 is an exhibit of the Big Horn Flats
4 study area and it is the gravity -- it is the
5 results of the gravity lands classification pro-
6 gram within that study area. It contains the
7 tracts of lands located where they were examining
8 the area -- or where they are located in the
9 area and the various colors are used again to
10 describe the class of lands or the results of
11 the classification program. and the class of lands.

12 Q Exhibit C-49?

13 A Exhibit C-49 is the Big Horn Flats study area
14 once more. It is the sprinkler land classification
15 results. Again, it depicts study areas and it
16 depicts the lands found within those areas to be
17 arable and the classification of the lands or
18 the class of lands is found by the same color
19 legend that we had used previously.

20 Q Would you please describe United States Exhibit
21 C-50 for us?

22 A Exhibit C-50 is entitled Riverton East. It is
23 the Riverton East study area, it is the results
24 of the gravity land classification system study

25 kersich-direct-echohawk

1 within that area. The lands that have been
2 judged arable have been located within the area
3 and the class that was assigned to them by us,
4 again, is by the same color scheme that we used
5 on the other exhibits.

6 Q Would you please describe for us United States
7 Exhibit C-51?

8 A C-51 is the Riverton East area. Again, it's the
9 results of the sprinkler lands classification
10 study. The tracts of land found arable are located
11 within that area. And the classification assigned
12 to each tract of land is as per the color methods
13 for identification that we used previously.

14 THE SPECIAL MASTER: Would you lift that
15 last one again? Let's look again for a minute,
16 please.

17 Yeah. Thank you for that.

18 Q Exhibit C-52.

19 A Exhibit C-52 is the Owl Creek area study area,
20 and it's the sprinkler land classification map
21 for that area. It depicts the lands that were
22 declared arable or deemed arable in the area
23 and they are described by classification by the
24 same color system used on the other exhibits.

25 kersich-direct-echohawk

1 Q Mr. Kersich, was there a gravity land class-
2 ification map prepared for the Owl Creek study
3 area?

4 A No, there was not.

5 Q Why not?

6 A Simply because we didn't find any land that met
7 the land classification standards as far as gravity
8 systems.

9 Q All right. Would you please describe Exhibit C-53,
10 please?

11 A C-53 is the Arapahoe area. It's the results of
12 our gravity land classification study. It depicts
13 the study area located within that study area,
14 the various tracts of land found arable under
15 those standards and the classification of the
16 lands is given the same color scheme that I
17 described on the other exhibits.

18 Q And finally, would you describe Exhibit C-54 for
19 us?

20 A C-54 is the Arapahoe area also. It is the results
21 of the sprinkler land classification study. It
22 depicts the area, the outline of the area, and
23 it gives the location of tracts of land within
24 that area that were found to be arable and the

25 kersich-direct-echohawk

1 classification of those lands is given by the
2 same color system that we used on the other
3 exhibits.

4 THE SPECIAL MASTER: I am going to find it
5 difficult to abstain from commenting on the fact
6 that if all of the irrigable, by sprinkler lands
7 which you have testified, which from earlier
8 evidence of other experts we find in the alluvium
9 of the Wind River, were to be irrigated by the
10 sprinkler systems that you say they can be, because
11 they are arable, the river will be dried up in a
12 matter of a few decades, if not at most a century
13 or so. Because the testimony is that in order to
14 stay alive and be charged, the alluvium of the
15 Wind River must have a live river in its -- passing
16 down. Without the live river, it dries up the
17 alluvium; and if all of this were to be put under
18 sprinkler system, to which you have testified,
19 there will be no more Wind River. I know that's
20 not your department, although you do say it is
21 arable and the irrigable lands, but I've got to
22 pull all this together in my little head one of
23 these months and I'll welcome from all parties some
24 evidence assimilation of certain expertise now

25 kersich-direct-echohawk

1 coming into this case.

2 MR. SACHSE: Your Honor, may I -- I suppose
3 the time will come soon when the Tribes are
4 able to voir dire on these, but I wanted to --
5 I suppose this is -- perhaps I should wait to
6 voir dire. I have a comment I want to make and a
7 question.

8 MR. ECHOHAWK: Would you --

9 THE SPECIAL MASTER: Tom wants you to wait.

10 MR. ECHOHAWK: I have some further questions.

11 THE SPECIAL MASTER: I could not resist making
12 that observation. The trial is coming to an end,
13 thank God, and we're coming into the integration
14 of these very important evidences and sooner or
15 later we have to have those things, I know.

16 MR. SACHSE: May I respond on your observation?
17 I just wanted to respond to your observation. I
18 think there is a misunderstanding that, as I under-
19 stand Mr. Kersich's testimony, and I hope this will
20 be straightened when he says something is possible
21 by sprinkler irrigation, that does not infer that
22 it would be irrigated from groundwater. A great
23 deal of sprinkler irrigation is done from surface
24 diversions.

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1 THE SPECIAL MASTER: Well, that is an
2 important matter.

3 MR. SACHSE: There has been no assumption
4 that sprinkler means groundwater --

5 THE SPECIAL MASTER: My first question this
6 morning was, on a center pivot sprinkler, and
7 there's only one kind of center pivot sprinkler
8 that I know of in this day in society, that is a
9 deep well with a pump in it that pumps -- now,
10 if that's in error, we better correct it right
11 now.

12 MR. ECHOHAWK: Your Honor, perhaps through
13 the witness --

14 THE SPECIAL MASTER: All right, Mr. Witness,
15 would you clarify what I just said?

16 THE WITNESS: Sure.

17 THE SPECIAL MASTER: Or correct it.

18 THE WITNESS: The water source for the center
19 pivot sprinkler can be ditches, it can be gravity
20 diversion from the river, anything of this nature.

21 THE SPECIAL MASTER: All right.

22 THE WITNESS: In fact, most of them, what
23 they are, as a matter of practice in the Wyoming
24 area, there are some that I saw out there a week

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1 ago, not quite a week ago, that were irrigated
2 from wells, wells located right along side the
3 ditch. So I expect what they are really doing is
4 drawing water right out of that ditch, but they
5 are drawing it through groundwater methods, but
6 I would say of all of the work we have done, and
7 we have done about 10,000 acres of sprinkler lands,
8 there are only two, about 1,200 acres that we
9 irrigated from groundwater, the rest of them were
10 from pumping like a source like the Yellowstone
11 River, if you're familiar with our country up
12 there at Hysam we pump out of the river there,
13 pump about 190 feet to the bench located directly
14 above the river and then canal the water to
15 various pumps where we pressurize it or pump it
16 back through a pipe and up through a pivot.

17 THE SPECIAL MASTER: Then you again pump it
18 for the sprinkler --

19 THE WITNESS: Yes, sir, that's right.

20 THE SPECIAL MASTER: That's called efficient
21 irrigation?

22 THE WITNESS: Well, the type of lands that
23 they are using there is very good land.

24 THE SPECIAL MASTER: We'll come to that.

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1 THE WITNESS: And the returns are there, sir.

2 THE SPECIAL MASTER: I suppose the economics
3 is in the crop and its yield.

4 THE WITNESS: That's correct.

5 THE SPECIAL MASTER: All right. I'm glad
6 we're going to enter this because it eliminates
7 one area of conflict in my mind, and that was that
8 I heretofore I had always felt that a center
9 pivot sprinkler, in Wyoming, was groundwater only --
10 was groundwater only and not surface water, and you
11 have made that distinction that that's not necessarily
12 so. It can be either.

13 THE WITNESS: It can be either.

14 THE SPECIAL MASTER: All right. Thank you all
15 for that.

16 MR. ECHOHAWK: Your Honor, perhaps it would
17 help me if we went ahead and took the lunch break
18 now and then I could see if there's anything else
19 I need before we turn it over to Mr. White.

20 THE SPECIAL MASTER: All right. Is 1:30
21 still satisfactory for the lunch break?

22 MR. ECHOHAWK: That's fine.

23 THE SPECIAL MASTER: All right. We'll stand
24 in recess until 1:30.

25

end 12

(Morning session recessed at
11:54 a.m.)