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File 149
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Case # 4993

File # 149

4400

APPEARANCES

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FOR THE STATE OF
WYOMING:

HALL & EVANS
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BY: MR. JAMES MERRILL, Special
Assistant Attorney General,

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and

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MR. STUART RIFKIN and
MR. SCOTT KROB

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FOR THE UNITED STATES
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FOR THE SHOSHONE
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SONOSKY, CHAMBERS & SACHSE
200 M. Street, N.W.
Washington, DC 20006
BY: MR. HARRY SACHSE

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1 THE SPECIAL MASTER: We will please come to
2 order. Mr. Merrill.

3 MR. MERRILL: Thank you, Your Honor. If the
4 Rev. Falwell starts up next door, I'll do my
5 best to continue to speak up.

6 THE SPECIAL MASTER: Hopefully, hope that he
7 pursues his ordeal and we'll pursue ours.

8 MR. MERRILL: Maybe as quietly, Your Honor.

9 Q (By Mr. Merrill) Ross, at the close of
10 yesterday's discussion we were talking
11 about tract 7-19X, which appears on Exhibit
12 C-208, and I believe, correct me if I'm
13 wrong, you mentioned that infiltration
14 test for the tract might shed some more
15 light on how the SAR and equilibrium SAR
16 could effect its arability; is that correct?

17 A Yes. We ran a mechanical analysis on a
18 sample where that test was taken that
19 turned out to be a loam, which is a rela-
20 tively light texture.

21 Q Would you please describe for the Court
22 what an infiltration test is and what it
23 measures?

24 A Yes. Well, this test is a standard test in
25 this type of work. It's used to measure

1 how rapidly water will infiltrate into the
2 surface soil. It's performed by using an
3 ion ring. A constant head of water is kept
4 in that ring and the amount of water that
5 goes through a measured area, the area of
6 that ring into the soil is monitored over
7 a period of time. And this gives an infil-
8 tration rate.

9 Now, this test, which we're speaking
10 of, has quite a low infiltration rate,
11 which is indicative of the sodium that is
12 in the surface at this time. However,
13 through leaching it is felt that the infil-
14 tration rate will improve as the sodium is
15 leached out and the soil condition is im-
16 proved through amendments.

17 Q Is the infiltration test you're speaking of
18 the one referred to on Line 2 of Exhibit
19 SW-9?

20 A One moment here.

21 Q It's called the sample number INF6.

22 A Yes.

23 Q The one that has an SAR of 187.9.

24 A Yes, it is.

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1 Q Let me hand you Exhibit WRIRSW-6 and ask you
2 if that document includes a copy of the
3 infiltration test that was performed on tract
4 7-19X7

5 A Yes, it does. As I stated, the sodium has
6 definitely affected the infiltration rate of
7 the soil.

8 Q What is the infiltration rate of that soil as
9 a result of test number 6?

10 A .09 inches per hour. Now, this is the virgin
11 condition, if you will.

12 Q What do you mean by that?

13 A This is not the infiltration rate that would
14 exist after the sodium has been replaced and
15 leached out of the profile.

16 Q What is involved in leaching the sodium out of
17 the profile and replacing it?

18 A Okay. This is a two-step process. As I stated
19 before we were -- we would not even attempt this
20 type of thing in a heavy clay, say. It's a two-
21 step process, involves number one, replacing the
22 sodium ion on the soil particle. Number two,
23 leaching the salts through the profile and drain-
24 ing it out the bottom. The -- There are several

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1 ways to go about this. One of them is by using
2 gypsum. The gypsum -- Well, the calcium in the
3 gypsum, gypsum is calcium sulfate. The calcium
4 will replace the sodium on the soil particle.
5 The sodium will complex with the sulfate ion,
6 will separate out and is leached out of the
7 bottom of the profile.

8 The other common method in the Riverton
9 area is to use sulfuric acid. Now, what
10 happens here, there are a couple of beneficial
11 effects. The sodium on the -- on the soil
12 particle is replaced with the hydrogen ion,
13 and the -- the sodium complexes with the sulfate
14 and goes out the bottom, but a further advantage
15 is that the caustic carbonate iron is destroyed
16 in this reaction. It goes to carbon dioxide
17 and water.

18 This could cause a problem using sulfuric
19 acid in some soils because by replacing the
20 sodium ion with hydrogen, of course, you don't
21 have the calcium in the soil, which acts as a
22 flocculating agent.

23 Q As a what kind of agent?

24 A Flocculating.

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1 Q You might want to spell that for the court
2 reporter.

3 THE SPECIAL MASTER: F-l-o-c-c --

4 THE WITNESS: u-l-a-t-i-n-g.

5 However, in these soils the calcium content
6 is very high and it just is not a problem as
7 far as the flocculation, once the sodium is
8 gone.

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1 Q (By Mr. Merrill) If you were to add gypsum or
2 sulphuric acid to this land, that would be again
3 another soil amendment; is that correct?

4 A Yes, it would. Now, HKM, as I said yesterday,
5 recognized this problem. We looked at it quite
6 closely.

7 We did both a technical analysis and a
8 cost analysis for the reclamation of this land.

9 For this piece in question, we determined
10 that there was enough free gypsum in the soil,
11 a much more free gypsum than appears, and it
12 was determined that about one-half ton per acre
13 of sulphuric acid was all that was required to
14 reclaim this land due to the free gypsum in the
15 soil once the sodium is gone and once the soluble
16 salts are leached out of the profile.

17 Our analysis indicates that sulphuric acid
18 applied to the land in that area runs anywhere
19 between ten and fifty dollars an acre.

20 Now, the acid is essentially free to the
21 farmer. It's a matter of having a place to
22 store it and being willing to take it.

23 We used a cost of about \$30 an acre, so we
24 were somewhere in the middle of this range to use

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1 as an application cost.

2 So for this piece of ground, we are looking
3 at approximately \$15 an acre for amendments of
4 reclamation of this land.

5 Q You said \$30 an acre. Did you mean \$30 a ton --

6 A Pardon me, yes.

7 Q -- for your sulphuric acid?

8 A Yes.

9 THE SPECIAL MASTER: How is it applied?
10 Is it sprayed?

11 THE WITNESS: Yes, it's generally used with
12 a boom. It's sprayed on the surface.

13 Now, you don't plow it in. It's better to
14 use a tine, harrow, or something. You just want
15 it in the top -- essentially in the top foot at
16 first.

17 You want it to be where the water can get
18 at it so you can get the reaction, and it will
19 gradually work down through the soil as things
20 improve.

21 Q (By Mr. Merrill) How did you determine that you
22 could get sulphuric acid -- excuse me -- that
23 one-half ton per acre of sulphuric acid would
24 solve these problems we have been discussing?

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1 A It's based on the gypsum requirement. Let's see.
2 One ton of gypsum equals .57 tons of sulphuric
3 acid.

4 Q Did you somehow measure the average content
5 of the gypsum in the top soil?

6 A A gypsum requirement test was run on these soils.
7 In USDA Handbook 60, it's lab method 22-D. It's
8 the method used. It's a standard gypsum requirement
9 standard.

10 THE SPECIAL MASTER: Do you know if this
11 process has ever been used in the history of the
12 Wind River Indian Reservation?

13 THE WITNESS: Yes, it has. We had personal
14 communication with farmers in the area, in the
15 Riverton area, that do use this.

16 Q (By Mr. Merrill) Do you know if this is the
17 same type of process that's been used to try to
18 reclaim lands in the third division of the
19 Midvale Project that were once in production and
20 are no longer in production?

21 A As I mentioned before, we don't even attempt
22 to make an analysis -- this type of analysis on
23 heavy clay soils.

24 Now, many of the soils that went out of

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1 production were due to the clay content in the
2 soils.

3 For the most part, these type of lands are
4 not reclaimed because of the cost in practice.
5 However, we are talking about different types
6 of lands here.

7 Q Is the principal difference between the Midvale
8 Third Division lands and this particular tract
9 whether there's clay or sandy loam in the top
10 soil?

11 A That's in large part the difference. It isn't
12 the entire difference. We are dealing with
13 cobbly, gravelly soils. In the areas we are
14 talking about, we are dealing with cobbly, gravelly
15 soils that have a high permeability, and it's a
16 different situation entirely.

17 Q Ross, would you please take Exhibit SW-2, which
18 is a copy of the 1953 Bureau of Reclamation
19 standards, and turn to page Page 2.4.3-A?

20 A One moment, sir.

21 MR. ECHOHAWK: May I have that citation again?

22 MR. MERRILL: Yes, SW-2, Page 2.4.3-A.

23 A I apparently gave that back to Mr. Salazar.

24 Q (By Mr. Merrill) Let me see if I have got another
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1 copy.

2 (Whereupon, a copy was
3 handed to the witness by
4 (Mr. Merrill.

4 A What was the page number?

5 Q (By Mr. Merrill) 2.4.3-A. The top of the page
6 reads, "Factors of Land Classification."

7 A I don't care for the numbering system here.
8 "Soil Factor," yes.

9 Q Got it?

10 A Yes.

11 Q Okay. Let's move down to about the bottom third
12 of the page that begins with paragraph two.

13 Would you please consider the general
14 paragraph two in conjunction with 2-B and 2-C?

15 Your land classification standards don't
16 have any particular values or requirements for
17 infiltration, do they?

18 A No.

19 Q Is there a range of infiltration values that you
20 consider permissible or that you considered
21 permissible in classifying the historic lands
22 as arable?

23 A We like to have several tenths of an inch per
24 hour infiltration. However, we must realize

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1 for this type of work when we are talking about
2 lands that are to be reclaimed, it is a somewhat
3 slow process until enough of the sodium is
4 replaced, until the soil condition is improved,
5 enough to allow more rapid infiltration of water.

6 Now, this is why we don't -- excuse me --
7 why we do not deal with heavy clays. It just
8 cannot get the water through the profile, and
9 what we are talking about here is a relatively
10 thin layer of loamy, whatever, soils, below which
11 lies sands and gravels and cobbles, so we are
12 talking about merely changing the structure in
13 a relatively shallow layer of soil before we can
14 improve the soil measurably from the stand-
15 point of infiltration.

16 Q You stated that it's a slow process to transfer
17 these elements down to lower levels of the soil.

18 How long would it take in a tract such as
19 7-19-X?

20 A Slow is a relative term, of course. These things
21 are more an art than a science at the present
22 time as far as the actual timing.

23 Now, with a texture this light, if one uses,
24 say, sulphuric acid as opposed to gypsum, sulphuric

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1 acid works more rapidly than gypsum, which is
2 why one uses it oftentimes rather than gypsum.

3 A person can use sulphur, elemental sulphur,
4 and do the same thing, but it's very slow acting.

5 It depends, No. 1, on how much water you
6 are willing to put on it. It depends on how
7 your drainage is acting.

8 I can't say. We're certainly not talking --
9 you know, we are not talking ten years. We are
10 talking a couple of years. perhaps.

11 Now, it should be realized too that for this
12 type of land where we are talking pasture, many
13 grasses are more salt tolerant than are, say,
14 sugar beets, so we are not talking about reclaiming
15 the soil from a bad situation all the way to a
16 totally salt-free environment. That just isn't
17 the consideration here.

18 Q We are talking about getting it in shape for hay
19 or pasture; is that right?

20 A That's correct.

21 Q Isn't it true that during the process or the
22 period of time that you were trying to cure
23 this land by adding sulphuric acid or any other
24 soil amendments, that you are going to see less

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1 yield from that land until the top of the soil
2 profile is brought into the proper range of
3 standards?

4 A Certainly.

5 Q As a soils scientist, do you believe that it's
6 important to pass that kind of information such
7 as decreased yields in the first few years on
8 along to the project engineer and economist for
9 them to consider?

10 A Yes, sir, it is, and we did.

11 Q What was the form of the information that you
12 passed on to those people concerning tract 7-19-X?

13 A We sent a copy of the photo that included this
14 land. We sent the cost of reclamation. We sent
15 the amount of sulphuric acid or gypsum that was
16 required, that type of information.

17 Q I forgot to ask you earlier back on Exhibit SW-2 --
18 we were looking at Page 2.4.3-A. I hope you didn't
19 lose it.

20 A No.

21 Q And particularly Items 2-B and 2-C.

22 As a soils scientist, do you concur with the
23 statements in 2-B and 2-C concerning the
24 infiltration rate of arable land?

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1 A Well, not entirely. These must be looked at in
2 the context in which they were written.

3 No. 1, this document was prepared in 1953.
4 The primary method of irrigation in those days
5 was through gravity as mentioned in 2-C, and
6 rapid infiltration rate can be quite easily
7 handled through design of sprinkler systems.

8 It is not nearly the problem with a sprinkler
9 system as it is with a gravity type application
10 of water.

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1 THE SPECIAL MASTER: What is the condition
2 of droughtiness, d-r-o-u-g-h-t-i-n-e-s-s?

3 THE WITNESS: It's the condition when water
4 moves through the profile rapidly enough, so
5 rapidly that it is not available to the plant,
6 the soil does not hold as much water as --

7 THE SPECIAL MASTER: It's the opposite
8 condition from too much percolation? The
9 percolation brings it to the surface and the
10 droughtiness then brings it to the base?

11 THE WITNESS: No.

12 THE SPECIAL MASTER: That's not so?

13 THE WITNESS: No. It's simply a matter
14 of the soil not being able to hold large
15 amounts of water for long periods of time
16 because of the many things. These large pore
17 space in sands, lack of -- often times lack
18 of organic matter, these type things, things
19 that hold water.

20 Q (By Mr. Merrill) Ross, did the land classi-
21 fication standards you used, either table 1
22 or table 5, include some standards that would
23 address the water holding capacity of the top
24 of the soil?

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1 A Yes, they do.

2 Q Which standards would those be?

3 A They are included in table 1 and table 5 of both.

4 Q On what items would they -- In other words, what
5 specific parameters of the classification standards
6 would affect the water holding capacity of the
7 soil?

8 A It's primarily a function of texture and depth of
9 soil. It may -- There are certain parameters
10 that touch on this also, such things as lime in
11 the soil. The lime increases the effective
12 water holding capacity of the soil. Salt has
13 an effect. There's many things that are correlary.

14 Q We're talking about the factors of land classifi-
15 cation in Exhibit SW-2. Would you please move
16 down to 2E and tell the Court what factors you
17 considered to ensure that the lands you classi-
18 fied as arable are readily susceptible to cultural
19 operations?

20 A Well, we should look more closely at this.
21 Paragraph 2, the heading reads "The general soil
22 conditions required for profitable sustained
23 irrigation agriculture include the following".

24 Now, these -- these things are somewhat

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1 tied up with irrigability rather than arability.
2 If you would -- If you would care to give me a
3 cultural operation that you have in mind, I'll
4 be happy to tell you how we considered that opera-
5 tion.

6 Q I'll do my best. Paragraph 2 speaks in general
7 terms of the soil condition?

8 A Certainly, but when we start to talk about
9 cultural operations, these things aren't clear,
10 aren't clear cut boundaries.

11 Q What I'm wondering first, before we start talking
12 about specifics, is whether you consider the
13 specific soil conditions or whether that para-
14 meter was left to the consideration of the project
15 engineer or the economist?

16 A The deficiencies, the soil deficiencies, the
17 land deficiencies in general were passed on into
18 the agricultural engineer and the economist who
19 made determinations as to how to handle these
20 deficiencies.

21 Q How about the cultible -- excuse me, the cultural
22 operation of tilling the land, preparing it for
23 planting? Is that an operation that you would
24 have considered the suitability of each tract

25 waples-cross-merrill

1 of land for or is that something the project
2 engineer would look at?

3 A The land classifier made a determination in the
4 field. However, as the tracts were looked at
5 very specifically by the agricultural engineer,
6 the soil classifier provided a flag, as it were,
7 to the agricultural engineer that this was some-
8 thing to look at, something to consider.

9 Q Would you please turn to page 6 of your report,
10 which is Exhibit C-226, and take a look at the
11 standards for surface gravel and cobble, Class
12 3 and Class 4. If land is too stony for practical
13 cultivations, does that limit the uses to which
14 that land can be put?

15 A Certainly, it limits it to a nonharvest -- a crop
16 that is not mechanically harvestable, certainly.

17 Q What crops would those be?

18 A Hay and pasture.

19 Q Are those the only two?

20 A Yes. Now, to clear up something here, perhaps not
21 all Class 3 lands are too stony to cultivate.
22 This is merely a condition that may be encountered
23 and if these lands are stony but still provide
24 good hay, they may be Class 3.

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1 Now, it has been a fact, we were discussing
2 a moment ago the Hart Mountain project yesterday.
3 There were originally quite a few lands in that
4 project that were classified as totally nonarable
5 because of stones in the -- on the surface, in
6 the top foot or so. These lands were determined
7 to be nonarable because of the cost of picking
8 up the stones, but in practice many of these
9 lands are now being irrigated because of the
10 individual farmers, rather than spending large
11 amounts of money to pick these rocks, he used
12 his time to pick these rocks. So this is the
13 type of thing that can be improved, but we have
14 a certain set of standards that we must follow.
15 But it is not a totally noncorrectable deficiency.

16 Q So you're saying that if you're willing to spend
17 the money you can clear up the rocks, and if
18 you're not willing to spend the money you can
19 grow either hay or pasture on land that's too
20 practical for cultivation?

21 MR. SACHSE: Objection, Your Honor, that's
22 not what he said. He said if you're willing to
23 spend the money or the time. Counsel shouldn't
24 mistake the witness's --

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1 THE SPECIAL MASTER: If the farmer wants to
2 spend his time picking up stones he can sure im-
3 prove his land. In fact, most of the northern
4 France are made up of rows of hedge rows of rock
5 on which the trees are grown, as I remember.

6 Q (By Mr. Merrill) Mr. Waples, in considering a
7 piece of Class 3 or Class 4 land, how would the
8 project engineer know if it were too stony for
9 practical cultivation? Would he look at the
10 map you sent to him?

11 A He would do that for a start. If he had a specific
12 question he can look at the land.

13 Q He would have to do the same thing with respect
14 to evaluating the nonproject land; isn't that
15 correct?

16 A That's correct.

17 Q Would you please tell the Court what subsurface
18 hydraulic conductivity, as it's defined on page 3
19 of each of your two tables, represents?

20 A Yes, sir. It's lateral water movement into the
21 soil.

22 Q Is that in any particular depth of the soil?

23 Is that at the top or in the very bottom of the
24 root zone or any particular place?

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1 A It can be any where, but there are certain places
2 where it's more important than others.

3 Q Where is it most important?

4 A This is more in the providence of the drainage
5 engineer, but I'll answer it generally. You're
6 interested in the hydraulic conductivity through-
7 out the profile, but if we have gravels or other
8 highly permeable soil, somewhere below the root
9 zone, we are interested from four to ten feet, say.
10 The drains are often -- Well, are usually put in
11 that -- that depth, somewhere in that depth to
12 keep the top four feet free of water. So it is
13 important to have -- to know what the hydraulic
14 conductivity is throughout the profile, but
15 especially below the root zone.

16 Q In the soil samples and the tract that you studied
17 as part of this work, were the results of the in-
18 filtration tests typically higher or lower than
19 the results of the hydraulic conductivity tests
20 for the same piece of ground?

21 A I don't know.

22 Q Would you please turn to your work photograph,
23 that refers to Exhibit C-208. That would be
24 279-256.

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1 THE SPECIAL MASTER: Are you going back to
2 those 311 acres, Mr. Merrill?

3 MR. MERRILL: Yes, Your Honor, with respect
4 to essentially getting some information that's
5 not in Mr. Waples's report.

6 THE SPECIAL MASTER: I was going to observe
7 that we have been on it a pretty long time for
8 that amount of land, maybe we can move to the
9 next point, but you can go ahead.

10 THE WITNESS: Yes, sir.

11 Q (By Mr. Merrill) Would you please describe for
12 the Court what land classification symbol you
13 have on your map for tract 7-19X?

14 A Yes, sir, I will. In the fractional symbol it's
15 6STD with (4). In the denominator it's K with a
16 3 as a subscript, A with 6 as a subscript, U with
17 2 as a subscript and D with 2 as a subscript.

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1 Q (By Mr. Merrill) Would you please refer to the
2 map symbol code on Page 8 of your report,
3 Exhibit C-226?

4 Are there a couple of symbols that appear
5 in the land class symbol that you just read that
6 are not explained in figure one on Page 8?

7 A I don't think so, no.

8 Would you restate the question?

9 Q Yes. Let me try it.

10 I don't see, for example, a capital Q. .
11 Does that also refer to available moisture-
12 holding capacity even though it's capital?

13 I'm just trying to understand the symbols
14 that you used on that particular tract.

15 A There is no Q that I see in my soils symbol.

16 Q Let me take a look at your map, if I could.

17 (Off-the-record discussion.)

18 MR. MERRILL: Thank you.

19 Q (By Mr. Merrill) Would you please turn back to
20 SW-2 which we were looking at a little earlier,
21 Page 2.4.3?

22 A Yes.

23 Q And look particularly at Item 2-F at the bottom
24 of that page. Is Item 2-F the same acidity

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1 problem that we were discussing yesterday with
2 respect to tract 17-X?

3 A Part of it is. Part of it isn't.

4 You have to differentiate sodium and black
5 alkali. Black alkali is a complexing of sodium
6 with organic matter.

7 I see no indication in the log or elsewhere
8 that black alkali was a problem on this tract
9 of land.

10 As far as the high amounts of sodium, there's
11 no question that what we are talking about is
12 reclaiming that land, so that there will not be
13 the injurious amounts of sodium in the soil under
14 sustained irrigation.

15 Q Does Item 2-G refer to the problem you mentioned
16 yesterday of an accumulation of salts on the
17 surface of the land?

18 A Certainly it does.

19 THE SPECIAL MASTER: I wonder, Mr. Merrill,
20 if we haven't exhausted the subject matter
21 thoroughly in all porportions to the time of
22 cross-examination on the merits? Do you feel
23 that you may be coming close to that point?

24 MR. MERRILL: Yes, as a matter fact, I am,

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1 Your Honor.

2 THE SPECIAL MASTER: Okay. Very good.

3 THE WITNESS: Was there a question
4 outstanding?

5 MR. MERRILL: No, there isn't. I'm trying
6 to think of one.

7 Q (By Mr. Merrill) Would you please explain to
8 the Court how you would reverse an accumulation
9 of salts?

10 A Certainly. Soluble salts are quite easily
11 handled. There were merely leached from the
12 soil.

13 If we have positive drainage and a relatively
14 light textured soil, water is applied to this
15 land and the salts, since they are soluble,
16 they wash out the bottom of the profile.

17 Q Did you make any investigation of the lands you
18 classified as arable in order to ensure that
19 they meet the requirements of paragraph 2-H
20 concerning an adequate supply of plant nutrients?

21 A Plant nutrients in alluvial soils are not the
22 problem they are in some other soils. The problem --
23 the limitation was pointed out to the agricultural
24 economist and from there it was up to him to deal

25 waples-cross-merrill

1 with it.

2 Q When you say the limitation, are you speaking
3 of the one in paragraph 2-H?

4 A The nutrients. We all know that soils in the
5 West are not as high in plant nutrients as many
6 of the soils, say, in the Midwest. It's some-
7 thing that we recognize.

8 It's something that we can handle. The
9 lands all over the West with low nutrients have
10 been handled. We can look at the sandy lands
11 in Arizona, very low initial fertility. This
12 is something that is not a permanent deficiency.

13 As organic matter builds up in the soil,
14 it provides a substrate to which the nutrients
15 attach themselves. As the land is farmed in
16 general, the fertility condition improves as
17 long as the land is managed with some degree of --

18 THE SPECIAL MASTER: Respect for rotating
19 crops and so on?

20 THE WITNESS: Yes, and competency, yes.

21 Q (By Mr. Merrill) Would you please turn to the
22 next page of Exhibit SW-2, and I'll ask you about
23 the last item in that list under 2, which is
24 No. 2-I.

25 waples-cross-merrill

1 What determination did you make that the
2 lands you classified as arable would resist
3 excessive erosion under economical irrigation
4 practices?

5 A Here again, such things as steep slopes -- very
6 steep slopes in the standards with pasture is
7 required. It is up to the agricultural engineer,
8 the economist, and the land classifier to, if
9 you would, come to a consensus concerning any
10 lands.

11 What we are talking about here is just again
12 good irrigation management practices.

13 One does not plow up and down steep hills.
14 One rotates crops. One keeps the organic matter
15 up through rotation of alfalfa, this type of
16 thing.

17 It tends to be more of a management
18 consideration than an out-and-out soils condition,
19 unless we have a specific condition that would
20 lead us to think otherwise, such as very sandy
21 soils.

22 THE SPECIAL MASTER: How does one keep from
23 contributing to the deterioration of the water
24 quality as he might to his own land not properly

25 waples-cross-merrill

1 cared for by continual discharge of salts to
2 the point the downstream users can ultimately
3 have no value in that water?

4 I'm speaking now of certification of the
5 Colorado River with international -- this could
6 be intrastate.

7 THE WITNESS: This is somewhat out of my
8 province. The water quality in general is very
9 high on the Wind River Reservation, so we are
10 not starting out with very salty water to begin
11 with.

12 If one looks at the water quality in Boysen
13 Reservoir below all of the irrigated lands --

14 THE SPECIAL MASTER: Was that HKM's
15 responsibility in its work in this case, do you
16 know, or was it not, or was water quality not
17 a concern or a consideration? Do I have to ask
18 someone else that question?

19 THE WITNESS: You should ask someone else,
20 Your Honor. I would note that the water quality
21 in Boysen below all of the irrigated land is still
22 very high. There's always a certain amount of
23 degradation whenever you irrigate lands in the
24 return flows, but it has not been serious in this

25 waples-cross-merrill

1 range.

2 Q (By Mr. Merrill) Ross, I'm going to shift gears
3 a little bit and talk for awhile about the
4 integration of your work with that done by the
5 economist and the engineers just so I don't
6 catch you offguard.

7 Would you please turn in your Exhibit SW-2,
8 the 1953 standards, to 2.2.1?

9 THE SPECIAL MASTER: Page beginning with
10 the word "Objectives"?

11 MR. MERRILL: Yes, Your Honor.

12 Q (By Mr. Merrill) When you formulated the arable
13 land base for the areas you studied, did Mr.
14 Toedter or Dr. Mesghinna or Mr. Dornbusch
15 participate in the formulation of that arable
16 base?

17 A No, sir, they did not.

18 Q I direct your attention to the six items at the
19 bottom of the page that are numbered A through F.

20 As I understand your testimony -- please
21 correct me if this is not a fair characterization --
22 you folks at HKM performed the study that
23 integrates Items A through D ending with application
24 of the land classification specifications?

25 waples-cross-merrill

1 A Just one moment and I'll read them.

2 Q Yes. Please take your time and read it over.

3 (Brief pause.

4 A Now your question is did we, in fact, do the

5 items A through D?

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1 Q (By Mr. Merrill) Yes.

2 A Not -- not exactly, no.

3 THE SPECIAL MASTER: Not by their
4 definition?

5 THE WITNESS: That's correct.

6 Q (By Mr. Merrill) Did you at any time modify
7 the classification you made of the arable
8 land base as a result of engineering or
9 economic information that you obtained?

10 A Yes. This tract on Exhibit C-208, tract 7-19X
11 that we've been discussing in some detail,
12 that would have been nonarable land had not
13 this additional analysis been done. That's
14 a case in point.

15 Q What type of additional analysis was performed
16 with respect to that tract?

17 MR. ECHOHAWK: Objection, Your Honor, asked
18 and answered.

19 THE SPECIAL MASTER: I think it has, Mr.
20 Merrill, has it not? I thought it was.

21 MR. MERRILL: May have been, Your Honor.

22 THE SPECIAL MASTER: Read the question again.
23 I must admit my mind was going out to the crowds
24 with the Reverend Falwell.

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(Thereupon the following question was read back as follows: "Q What type of additional analysis was performed with respect to that tract?"

THE SPECIAL MASTER: I think he's been through it quite clearly. I'm going to sustain it.

Q (By Mr. Merrill) Approximately how many tracts did you modify your classification of as a result of special economic or engineering studies?

A There were, off the top of my head I can think of three tracts such as this that we dealt with. Now, there may have been others.

THE SPECIAL MASTER: Gentlemen, we've been at it almost an hour, why don't we take a ten minute recess.

MR. MERRILL: That's a good idea.

(Thereupon a ten minute recess was taken.

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waples-cross-merrill

1 THE SPECIAL MASTER: Is everybody ready?

2 Okay. Let's resume.

3 MR. ECHOHAWK: Mr. Merrill, before we
4 resume, I'd like to bring up one point.

5 THE SPECIAL MASTER: On or off the record?

6 MR. ECHOHAWK: On the record.

7 During the break, I was informed by Mr.
8 Rifkin that it was the intention of Wyoming's
9 experts, who are going to the Reservation this
10 week, to work through the weekend and continue
11 on with their work or whatever.

12 This causes a great hardship on the BIA
13 escorts and also on the BIA budget in having
14 these people work overtime.

15 I think it's somewhat unreasonable. If
16 we could keep it to business days, it would be
17 most helpful, especially in light of the
18 additional 15 days that we gave Wyoming.

19 THE SPECIAL MASTER: I appreciate that and --

20 MR. MERRILL: Your Honor, if I could
21 respond just briefly, the main reason we made
22 that request is it takes a day just to get your
23 folks and your equipment up there, and our folks
24 hope to be able to get done in one fell swoop
25 and get out of the Reservation.

1 THE SPECIAL MASTER: Are they working
2 Saturday but not Sunday? Are they going to
3 use both days?

4 MR. MERRILL: I'm not sure that would solve
5 Mr. Echohawk's problem.

6 MR. ECHOHAWK: In the past we have received
7 several, I guess, complaints by the BIA of this
8 sort of thing, and the budget is very limited
9 as it is, and they have a hard time paying those
10 people overtime.

11 THE SPECIAL MASTER: Let the BIA know that
12 I considered trying to do something to save
13 them this additional expense, and under the
14 circumstances I believe it's in the best interests
15 of the Reservation and of the Indians that we
16 proceed and let them go through the week's work,
17 so if they will bear with us and have some
18 indulgence and put out the escorts this weekend,
19 I hope I can help them with whatever budgetary
20 problems there are or at least I will send letters
21 for appropriations or consideration in paying,
22 but let them know we have to do it this way.

23 MR. ECHOHAWK: That will be Saturday and
24 Sunday?

25 MR. MERRILL: That's correct, Your Honor.

1 THE SPECIAL MASTER: Yes.

2 MR. ECHOHAWK: I'll call them.

3 THE SPECIAL MASTER: All right. Thank you
4 very much, Tom.

5 I don't know what else I can do, frankly.

6 Okay, Mr. Merrill.

7 MR. MERRILL: Thank you, Your Honor.

8 Q (By Mr. Merrill) Ross, I direct your attention
9 to Exhibit C-188, which I have put up on the
10 easel over the break, and particularly to tract
11 1-60-X.

12 A 1-60-X?

13 Q Yes.

14 A May I get the photo?

15 Q You bet.

16 A Okay.

17 Q While you have got your photograph, I'm going
18 to hand you what's been marked for identification
19 as Exhibit WRIR SW-11 and ask you to identify that,
20 please.

21 A Yes, sir. That's a log form that was filled out
22 for a hole that was augered on photograph 14-179-67
23 by myself.

24 Q So this soil log, SW-11, is your own work; is
25 waples-cross-merrill

1 that correct?

2 A Yes, sir, it is.

3 Q Does it relate to a hole that was augered on
4 tract 1-60-X?

5 A Yes, it does.

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1 Q (By Mr. Merrill) Okay.

2 THE SPECIAL MASTER: 1-26-X?

3 MR. MERRILL: Sixty X, Your Honor.

4 THE SPECIAL MASTER: All right, thank you.

5 Q (By Mr. Merrill) Ross, would you please explain
6 what that soil log shows for the Court?

7 A Yes, I will. The cause for concern, I believe
8 here is the fact that the caliche was encountered
9 by 36 inches below the soil.

10 THE SPECIAL MASTER: What is caliche?

11 THE WITNESS: It's a salt deposit that varies
12 in hardness from a calcium carbonate zone to
13 an exceedingly hard formation. It's water
14 deposited.

15 This oftentimes, caliche is not
16 in irrigation studies, arability studies. It's
17 encountered oftentimes on many places in the
18 West. It is handled very readily, depending
19 on how hard it is. This says it was too hard
20 to auger, that's true in its dry state. There's
21 two mitigating factors here which is why the
22 lands were left arable for pasture. No. 1, as
23 water is put on this type of formation it usually
24 softens up and leaches out the bottom.

25 waples-cross-merrill

1 No. 2, deep plowing often can be used,
2 ripping, to rip this up and it's no longer a
3 problem. It's encountered, certainly not in
4 the majority of cases in arable lands, but it
5 certainly is encountered and it can be handled.

6 Q (By Mr. Merrill) I hand you what's been marked
7 for identification as Exhibit SW-13 and ask you
8 to turn to Page 3 of that exhibit after you've
9 identified it for the record.

10 A Yes. That is a "Glossary of Soils Science Terms"
11 published by the Soils Science Society of
12 America, SW-13. Page 3?

13 Q Right.

14 A Okay.

15 Q Do you find the definition of caliche on Page 3?

16 A Yes, sir, I do.

17 THE SPECIAL MASTER: Well, I commend you
18 on your off-the-top-of-your-head definition
19 compared to this one.

20 THE WITNESS: Thank you.

21 MR. MERRILL: Awfully good, isn't it, Your
22 Honor?

23 Q (By Mr. Merrill) Isn't it true that caliche
24 can be a barrier to roots or the passage of

25 waples-cross-merrill

1 water?

2 A Certainly it is, which is not to say that all
3 caliche is a barrier to roots and water nor is
4 it to say as I just discussed, nor is it to say
5 that it cannot be handled.

6 As you can see, this was considered as
7 Class 4. We looked at this, we looked at it
8 quite carefully.

9 Q Is it true that caliche contains a fairly high
10 amount of calcium?

11 A Yes, sir.

12 Q Isn't it also true that the higher calcium levels
13 present in caliche would require higher phosphate
14 fertilizer to correct?

15 A That's a possibility. Oftentimes high amounts
16 of calcium carbonate salt tie up phosphates in
17 the soils, yes.

18 Now, that's another thing that has been
19 pointed out to the agricultural engineer and the
20 economist. This has been discussed with them at
21 some length.

22 Q Going through them before I even get to the
23 questions.

24 Did you determine how much, if any, additional
25 waples-cross-merrill

1 phosphorus fertilizer over the normal amount
2 would be required for these lands?

3 A I don't have -- I don't have any numbers.
4 As I say, the -- the possibility or the need for
5 additional phosphate fertilizer was considered,
6 and I believe monies were included in the
7 budget for this type of thing.

8 Q For special amendments, are you saying?

9 A For fertilizer, yes.

10 Q What information did you pass along to the
11 project engineer and the project economist
12 specifically with respect to any additional
13 fertilizer that might be needed for this tract?

14 A Well, if I may expand my answer just a little
15 bit.

16 Q Please do, please do.

17 A We have, in general, soils in this country that
18 are high in calcium carbonate. It is not a
19 limitation. In fact, in some cases it helps
20 other limitations of the soil such as water
21 holding capacity because it, in effect, in
22 effect makes the texture more similar to the
23 finer type soils as opposed to the sands.
24 You're able to keep more water in that soil.

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1 So we don't consider it a limitation, the fact
2 that we do have, in some soils, quite a lot of
3 calcium carbonate, as I say, was pointed out
4 to the agricultural engineer and the economist,
5 and given them information as to people to
6 discuss this problem with and see how it is
7 handled. Most of the irrigation on virgin lands
8 in the West is on calcium dominated soils.
9 It is no big problem, it can be handled, it's
10 handled every day.

11 Q Are we talking about calcium dominated soils or
12 are we talking about caliche or are they one
13 and the same?

14 A We're talking about -- Well, I'm not sure what
15 you're talking about. I'm talking about calcium
16 dominated soils, which in some cases are simply
17 a lime zone or can be a case such as this where
18 we have caliche.

19 Q Did you do any other drilling or augering or
20 testing for tract 1-60-X?

21 A No, sir. A deep hole was augered a little bit
22 to the East. It's in the same type of formation,
23 It was determined that this was not the barrier.

24 Q May I look over your shoulder at your map?

25 waples-cross-merrill

1 I don't have ours with us.

2 MR. CLEAR: The record should reflect we
3 have a heavenly choir accompanying Mr. Waples'
4 testimony.

5 THE WITNESS: The tract -- We're looking at
6 aerial photo 14-179 -- excuse me, 67, the soils
7 copy.

8 THE SPECIAL MASTER: That's the base for
9 188?

10 THE WITNESS: Yes. We're looking at -- on
11 188 the tract we're discussing is 1-60-X, which
12 is adjacent to 1-62-X.

13 THE SPECIAL MASTER: Yes.

14 THE WITNESS: Now, the same type of deposit,
15 except not as -- not as --

16 THE SPECIAL MASTER: Thick?

17 THE WITNESS: Well, perhaps as thick, but
18 not as indurated, not as hard, occurs in this
19 other tract. Now, a deep hole was drilled in
20 that piece of ground and some determination was
21 made.

22 THE SPECIAL MASTER: At what depth was this
23 incurred?

24 THE WITNESS: If I can go to my logs?

25 waples-cross-merrill

1 often it's softened through water application,
2 it is a potential problem as it lies, it can
3 be handled.

4 Q Do you know how thick the strata of caliche
5 is in that tract?

6 A Well, perhaps I should look at the deep hole that
7 was augered. It might give us some indication.

8 Q Please do.

9 THE SPECIAL MASTER: While Mr. Waples is
10 searching for that document, I want to take a
11 few minutes to ask you, Mr. Clear, now that
12 you've had your first week of experience in this
13 lawsuit or your prior baptism of fire, and you
14 Mr. Merrill, as two of the attorneys of the
15 principal parties in the litigation, to give
16 some thought to the possibility that you two
17 might have some type of conference with other
18 attorneys and with your technical people on both
19 sides to see if you can arrive at figures on which
20 you could stipulate are the arable acreage figures
21 for the various classifications on the
22 Reservation, and furthermore, even to meet to
23 see if you could stipulate on those figures that
24 would be then recommended to the experts or

25 waples-cross-merrill

1 economists and other who would pass judgment
2 on whether they can become irrigable acreage
3 or not.. I know you're not going to agree on
4 the total amount of water for that acreage,
5 that's my job and I intend to, you know, fulfill
6 it. But you could save us several weeks, maybe
7 even a month of trials if such a stipulation
8 and agreement could be arrived at. Both sides
9 have seen now what an excellent minute job of
10 checking of every witness has been done by the
11 State, and there have been some challenges to
12 classification that have been with merit, there
13 have been others that maybe were not as meritorius
14 but you two can almost be the judge of what can
15 be subtracted and what can be added to these
16 acreage figures. If you think it's worth an
17 effort next week since we're not having trials
18 next week to try and get together and try to come
19 to some stipulation? What are your thoughts on
20 this, Mr. Clear?

21 MR. CLEAR: Your Honor, I think we can try,
22 I don't know if I'm -- if I have enough information
23 at this time. I think we are losing sight of one
24 point here at this stage. Here we're talking
25 about the arable acres and upon that we will build

1 we would cut that down, I think, to come up
2 with irrigible acres.

3 THE SPECIAL MASTER: That's right.

4 MR. CLEAR: So I think perhaps --

5 THE SPECIAL MASTER: We're premature?

6 MR. CLEAR: Well, I think, as I understand
7 it, and I may be wrong, is that some of these
8 arable acres will not fit the criteria of the
9 economist and the agricultural --

10 THE SPECIAL MASTER: I see.

11 MR. CLEAR: So that they will not be
12 irrigible, and I don't know whether Mr. Merrill
13 has an idea of what those things are or I have
14 an idea.

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1 THE SPECIAL MASTER: Your thought is that
2 my suggestion might be premature?

3 MR. CLEAR: My feeling right now is a
4 stipulation as to arable acres may be kind of
5 irrelevant.

6 THE SPECIAL MASTER: I see your point.

7 MR. CLEAR: But maybe I'm wrong in that.
8 I would rather discuss that with my co-counsel
9 because I'm just finding out what a water duty
10 is, Your Honor, so I'm not sure --

11 THE SPECIAL MASTER: All right. I wanted
12 to make my thoughts known in the event they
13 might be of some savings of time.

14 Do you have any suggestions or thoughts
15 on my observations?

16 MR. CLEAR: I'm not suggesting a meeting
17 would not be --

18 THE SPECIAL MASTER: I appreciate that.
19 Your point is well taken, and that is we are
20 on arability now and not irrigability, and there
21 is a difference.

22 Mr. Merrill, do you have any thoughts on
23 my observation?

24 MR. MERRILL: Yes, Your Honor, I do.

25 First, we are not ready for such a meeting

1 in that the State's experts are just now in
2 the very process of developing their version
3 of the arable land base for the Reservation
4 which, as Mr. Clear has pointed out, will
5 ultimately be carved down to irrigable land
6 base, so as you can see, we are still a little
7 bit away from the process.

8 Once we have determined an arable land
9 base, we are going to be providing that to the
10 United States, either through formal or informal
11 discovery, whichever avenue they choose to
12 obtain it, and I think that once that's the case,
13 we will all have our cards on the table, so to
14 speak, as to the arable land base, and at that
15 point we'll be ready to begin some sort of a
16 dialogue, but up to this point, there has simply
17 been no use, and that's why we haven't bothered
18 one another with it because it wouldn't be
19 productive.

20 THE SPECIAL MASTER: I appreciate that, but
21 I wanted to make the observation, hoping that
22 it might serve a good purpose down the road.

23 All right. We are back to the document
24 on that depth --

25 THE WITNESS: Okay. The deep hole was augered,

- 1 approximately in here (indicating) --
- 2 Q (By Mr. Merrill) Now, you are indicating the --
- 3 A Excuse me.
- 4 Q -- the dot in the center of tract 163-X?
- 5 A That's correct.
- 6 Q Okay.
- 7 A To get things straight on the record.

8 Now, when that hole was augered, not
9 enough caliche was encountered to even be
10 noted on the log. It was soft enough that it
11 was not even noted worth -- or deemed worth
12 noting.

13 THE SPECIAL MASTER: In feet or in yards,
14 how much to the east is that hole from the one
15 that had been put in on the parcel to the left
16 of it?

17 THE WITNESS: We are -- I don't know.
18 Perhaps a third of a mile. I don't know. They
19 are -- it is the same type of land.

20 Now, furthermore, in that same -- again in
21 parcel 1-63 there was another land classification
22 hole that went to 72 inches without encountering
23 the caliche which indicates that this -- that's
24 why 1-60 was separated out from the other lands

25 waples-cross-merrill

1 because it does have these limitations. It's
2 not widespread,, and there again it can be
3 handled. It was looked at quite carefully.

4 Q Do you not have a log entry on the hole you
5 were discussing in tract 163-X, the deep hole?
6 I take it you don't have any logged entries
7 which show the indication of caliche?

8 A That's correct. Now, that indicates to me that --

9 THE WITNESS: I may have misspoke, Your
10 Honor. I was looking at the wrong one.

11 A (By The Witness) No, there was no mention of
12 the caliche. This hole was augered to ten
13 feet, and it was not significant enough to
14 mention. Evidently, it's a very thin lens.
15 It was not easily determined. It was not
16 easily defined by the drilling program.

17 Q Would you please tell the Court what the
18 equivalent was used to drill that hole near
19 the dot in the center of 1-63-X?

20 A I didn't do that drilling. Mr. Toedter would
21 have to speak to that. It was a power auger.

22 Q Do you know if the auger was equipped with what's
23 commonly known as a rock bit?

24 A Not having drilled the hole, I just don't know.

25 waples-cross-merrill

1 Q Is this tract 1-60-X one in which you obtained
2 special input from either the engineers or the
3 economists in determining its arability?

4 A No, the limitations to that land were pointed
5 out to the agricultural engineer and agricultural
6 economist just as they were for other tracts
7 of land.

8 Q Would you please direct your attention to
9 tract 1-63-X, which also appears on C-188?

10 MR. SACHSE: Your Honor, I want to object
11 at this point to further cross-examination
12 tract-by-tract with this witness. I think cross-
13 examination has gone far enough to expose the
14 competence of the witness, the program that
15 was done.

16 The data tract-by-tract is given in the
17 reports and the logs that have already been
18 supplied.

19 It seems to me that at some point cross-
20 examination has to end.

21 Mr. Merrill told us yesterday he would be
22 finished with his cross-examination by the end
23 of the day yesterday, and I don't see how this
24 case is ever going to end if we just keep going

25 waples-cross-merrill

1 tract-by-tract over everything every witness
2 did.

3 THE SPECIAL MASTER: Mr. Merrill, you know
4 I'm inclined to agree with the objection. I
5 have been concerned about this and have been
6 abiding in your patience since you stated it's
7 almost there.

8 I presume you are just about at the
9 conclusion of your cross-examination.

10 MR. MERRILL: Your Honor, this is my last
11 tract, and I have only cross-examined
12 witness with respect to three or four specific
13 tracts that I selected in order to give the
14 Court the types of feelings and assumptions and
15 judgments made by the witness.

16 THE SPECIAL MASTER: Your having assured
17 the Court that this is your last tract, I will
18 let you proceed with your question.

19 Q (By Mr. Merrill) Do you have that tract 1-63-X
20 located, Ross?

21 A Yes, sir, I do.

22 Q Does your land classification symbol for that
23 tract contain a small P in the demonination?

24 A Yes, sir, it does.

25 waples-cross-merrill

1 Q Would you please tell me what a small P in the
2 demonination of the symbol means?

3 A That was simply there for my own use and for the
4 drainage engineer's use. It means that in the
5 field there was some question about the
6 permeability because -- we have been over this
7 caliche layer. We were concerned about it
8 potentially as a barrier and potentially as a
9 permeability problem.

10 Now, as I have stated, this later turned out
11 not to be the case.

12 Q So the small P is sort of an internal flag, if
13 you will, to check or perhaps recheck for
14 permeability problems?

15 A That's correct.

16 Q Okay. I hand you what will be the last of the
17 soil logs I'm going to hand you, that has been
18 marked as SW-12, and ask you if you can identify
19 that, please?

20 With the Star Spangled Banner playing in
21 the background, would you please describe for
22 the Court what that log shows?

23 A Yes, sir, I will. It's a log for Hole 8,
24 photo 14-179-67, which is again the basis for
25 waples-cross-merrill

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Exhibit C-188.

It lies in tract 1-63-X with a log prepared by myself in the type of land where we were discussing, the caliche area, the same land.

It shows -- I assume what Mr. Merrill is getting at -- I don't know what Mr. Merrill is getting at.

It shows the hole is 72 inches deep to gravel.

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waples-cross-merrill

1 THE SPECIAL MASTER: What does it show
2 after the word "Heavy"? In the 72 inches to
3 gravel which is the far right, "Heavy M.O."

4 THE WITNESS: Mottling. This indicates,
5 these are spots of iron or magnesium or some
6 other metal that have oxidized, they're colored
7 blotches in the soil, if you will.

8 Q (By Mr. Merrill) Could the mottling in the
9 land also indicate high groundwater?

10 A Mottling in general is indicative of a fluctuating
11 water table. The water comes up, wets these
12 minerals, it falls back down and they oxidize,
13 they rust, if you will.

14 It indicates that drainage may be a
15 requirement in this land is all it indicates.

16 THE SPECIAL MASTER: Is this an alluvium --

17 THE WITNESS: Yes, sir.

18 THE SPECIAL MASTER: -- land? Is it near
19 a river?

20 THE WITNESS: Yes.

21 THE SPECIAL MASTER: Half mile, quarter mile
22 or so?

23 THE WITNESS: Right, from the Little Wind
24 River.

25 waples-cross-merrill

1 Q (By Mr. Merrill) In classifying that tract of
2 land as arable, Class 3, you determined that
3 it would be possible to drain that tract?

4 A I did not make the final drainability analysis,
5 if you will, on that tract.

6 Q Did Bob Toedter make that analysis?

7 A Yes, sir.

8 Q Do you know if any special input was either
9 received by the project engineer or the
10 economist with respect to the potential problems
11 of draining tract 1-63-X?

12 A I have not seen the latest or looked at, in
13 detail recently, the latest drainage and layout
14 designs. They're brand new. Concerning this
15 tract, if the agricultural engineer or economist
16 felt they couldn't make it work, it wouldn't
17 show up on the -- on their layouts. I certainly
18 can't speak for them.

19 Q I'm asking you only with respect to the arable
20 land base and not the irrigible land base.

21 A Okay. I guess you'll have to ask your question
22 again.

23 Q Okay. Let me try another run at it.

24 Are you saying that you consulted with Bob
25 waples-cross-merrill

1 Toedter concerning the drainage problems of
2 this tract before you classified it as arable?

3 A Well, the initial, initial arability determination
4 was made, then drainage analysis was done to
5 verify that or throw it out. These two type
6 studies work together.

7 Q Hand you what's been marked for identification
8 as SW-14 and ask if you would identify that,
9 please.

10 A Yes, sir. That is another chemical laboratory
11 form, the type used by HKM. It has certain lab
12 data, I assume relative to the tract we're
13 discussing.

14 THE SPECIAL MASTER: Off the record

15 (Off-the-record discussion.)

16 MR. MERRILL: May we go back on the record,
17 Your Honor?

18 THE SPECIAL MASTER: Yes, I beg your pardon.

19 Q (By Mr. Merrill) Ross, I direct your attention
20 to the chemical analysis data shown under Hole 8,
21 which I believe is the second hole described on
22 Exhibit SW-14. Isn't it true that that chemical
23 analysis shows an SAR of approximately 20.2 in the
24 surface horizon, the study you took from Hole 8 --

25 waples-cross-merrill

1 of the sample you took?

2 A Yes, it does. As I said, we looked at this
3 parcel quite -- quite extensively. The textures
4 are not clays. It goes -- It just wasn't
5 considered to be a problem. It was a problem,
6 a limitation, if you will that could be handled.

7 Q Would an SAR of 20 also have been injurious
8 to crops that would have been grown on that
9 land?

10 A Depends on what crops we're discussing, Mr.
11 Merrill.

12 Q How about native hay and pasture hay?

13 A The principal concern with a high SAR is the
14 physical condition of the soil. Before sodium
15 becomes toxic we're talking a very high level,
16 I won't hazard a guess, but it's very high
17 before the sodium ion starts causing injury
18 to the plant.

19 So what we're concerned with primarily is
20 the physical condition of the soil, which
21 deteriorates when large amounts of sodium are
22 present.

23 As I say, we looked at this, it was
24 determined not to be a problem for the type of
25 waples-cross-merrill

1 crops that would grow there. Certainly hay
2 and pasture -- Well, perhaps I can explain
3 it best this way: Right now there's a quite
4 healthy stand of grass on that land.

5 Q Were you considering any other crops in
6 classifying that land as arable?

7 A I didn't make that determination. It's Class 3,
8 that's as far as I went with it.

9 MR. MERRILL: Your Honor, I misspoke
10 myself. I do have one more tract, and I would
11 ask the Court's indulgence in letting me
12 cross-examine the witness with respect to that
13 tract.

14 We were talking yesterday generally about
15 tracts within the future lands which might
16 surround a nonproject land classified by Mr.
17 Waples. I was unable at that time to point
18 out a specific example of such a tract to provide
19 a more concrete basis for cross-examining the
20 witness. I have located such tract and would
21 ask the Court to allow me to cross-examine on
22 this one last tract. It is my last page of
23 cross-examination.

24 THE SPECIAL MASTER: I'll give you a couple
25 waples-cross-merrill

1 minutes; go ahead.

2 MR. MERRILL: Thank you.

3 Q (By Mr. Merrill) Ross, would you please pull
4 out photo "11" -179-166?

5 THE SPECIAL MASTER: Can you ask him about
6 it or does he have to have the photo?

7 MR. MERRILL: He's going to need the photo-
8 graph because it contains information not
9 depicted on these exhibits.

10 THE WITNESS: "11"-166?

11 MR. MERRILL: Yes.

12 MR. ECHOHAWK: One sixty-six?

13 MR. MERRILL: Yes.

14 (Brief pause.)

15 Q (By Mr. Merrill) I direct your attention to
16 tract 25-3-X, which is a 400, roughly 400-acre
17 parcel of land classified 3 gravity, 2 sprinkler.

18 A Yes, sir.

19 Q Would you please consult photo "11" -179-166
20 and tell the Court whether this tract of land
21 lies both below and adjacent to new project lands
22 shown in Exhibit C-48?

23 A Okay. If I may, let's see, I'm looking at
24 Exhibit C-48 in Section 13.

25 waples-cross-merrill

1 Q Of Township 2 North, Range 3 West?

2 A That's correct.

3 Okay. I believe, someone can correct if
4 I'm wrong, I believe Mr. Kersich discussed
5 this tract of land. This lies adjacent to the
6 Gurna Tewon, Ditch, T-e-w-o-n. This is a tract
7 classified at two different times. It was
8 classified in historic and the future programs.
9 There was some confusion at the time as to
10 which -- which program it would end up in, and
11 as a result, a portion of this ends up in both
12 programs.

13 Now, as I said, I believe this was noted
14 in Mr. Kersich's testimony, that this was the
15 only overlap that we knew about. I believe if
16 we look at this closely, part of what we're
17 saying is adjacent lands is in fact this overlap.
18 If we can look at the photograph it will become
19 obvious that the future lands that are adjacent
20 to the historic lands is a very, very small parcel
21 that would have no effect on the future lands.

22 Perhaps I could show this to Counsel.

23 Q Let me ask you a couple of questions about it,
24 Ross.

25 waples-cross-merrill

1 A Okay.

2 Q Directing your attention to Exhibit C-48, which
3 is the gravity land classification map for the
4 Big Horn Flats area, which I believe was
5 testified to by Mr. Kersich, and directing
6 your attention more specifically to Township 2
7 North, Range 3 West, Sections 13 and 14, isn't
8 it true that Mr. Kersich classified two tracts
9 of future arable land extending within those
10 two sections as Class 2 and Class 3 gravity?

11 A Certainly, but what I'm saying -- Go ahead,
12 I'm sorry.

13 Q Now, what I'm asking you is does the tract that
14 you classified on Exhibit C-175 fit into the
15 little niche to the east, if you will, of those
16 two tracts classified by Mr. Kersich, with
17 perhaps some overlap?

18 A Quite a lot of overlap. As I said, if we could
19 look at the aerial photo this matter will be
20 cleared up.

21 Q Okay. My question goes to the land classification
22 standards, which of the two, the project or the
23 nonproject that you used to classify that tract
24 of land fitting in between, which is shown as

25 waples-cross-merrill

1 tract 25-3-X on Exhibit C?

2 MR. ECHOHAWK: Objection. I don't believe
3 that's quite the case. I believe Mr. Waples
4 said it doesn't quite fit in between these,
5 there's a major overlap.

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waples-cross-merrill

1 THE SPECIAL MASTER: Well, yes, you could refer
2 to it without --

3 MR. MERRILL: Your Honor, we are happy to agree
4 that there is an overlap.

5 THE SPECIAL MASTER: To an opening that you
6 referred to on C-48, but I'm sure there is no ques-
7 tion about what land he is talking about in the wit-
8 ness' mind, is there?

9 THE WITNESS: No, there isn't.

10 THE SPECIAL MASTER: Okay, would you answer
11 that?

12 A. Okay. These lands were classified with the nonproject
13 standards. Now, I should point out again, as I did
14 concerning another tract or two, for this case there
15 really was no significant difference in the two.

16 We did not have a depth to barrier problem.
17 We did not have severe cobbles or gravels in the
18 surface. They essentially become the same -- the
19 standards are essentially the same for this type of
20 land, but even more importantly, all we have that
21 was included in the future is a very small sliver
22 of land --

23 THE SPECIAL MASTER: In acreage, how much does
24 it encompass?

25 waples - cross - merrill

1 THE WITNESS: The future?

2 THE SPECIAL MASTER: No, the inclusion that
3 went in both, the lands that went both into future
4 and your historic.

5 THE WITNESS: That, sir, I do not know.

6 THE SPECIAL MASTER: Would you throw a ballpark
7 figure at it? Are you talking about 10 acres or 100
8 acres?

9 THE WITNESS: Well, let's see. This entire
10 parcel is 400 acres.

11 THE SPECIAL MASTER: 399.9, but I meant that
12 part that was included in both.

13 THE WITNESS: Sure. This entire parcel except
14 perhaps -- well, from looking at the photograph, 30
15 acres maybe.

16 THE SPECIAL MASTER: That's good enough. That
17 gives me some indication of the measure of what we
18 were talking about yesterday and the 90-percent
19 accuracy.

20 MR. MERRILL: Your Honor, the purpose of bring-
21 ing this one up wasn't to cross-examine the witness
22 with respect to overlap because we will planimeter
23 that difference and present it as part of our case
24 in chief.

25 THE SPECIAL MASTER: All right.

1 MR. MERRILL: My questions to the witness con-
2 cerned the justification for the piece of nonproject
3 land that's adjacent to what may be future irrigated
4 lands.

5 THE WITNESS: And, sir, the answer is that the
6 fact that there is a very small amount of future lands
7 adjacent to this tract -- it's just a small sliver.
8 It will have no effect upon the nonproject historic
9 lands we are discussing.

10 Q (By Mr. Merrill) Isn't it true that the future lands
11 lie uphill of the Tract 25-3-X?

12 A Yes, it is, but it's of no consequence if the acreage
13 is small as it is here.

14 Q Is it true that the water would be contributed from
15 those uphill tracts to 25-3-X?

16 A Very little water is going to be contributed from a
17 -- whatever a 30-acre parcel -- this is not a reason-
18 able concern.

19 Q I think that will ultimately be for the Court to
20 decide.

21 MR. MERRILL: Your Honor, I have no further
22 cross-examination of Mr. Waples, but I would like
23 to offer as exhibits several of those that I have
24 used in cross-examination.

25 waples - cross - merrill

1 And also in response to the Court's concern
2 yesterday about duplicative exhibits, I will point
3 those out as well and perhaps we can eliminate a
4 little bit of paperwork.

5 I used as an exhibit in aid of cross-examination
6 Waples' SW-2, which is, indeed, the same exhibit as
7 Mr. White used in the cross-examination of Mr. Ker-
8 sich, and in his cross-examination it was labeled
9 SK-4.

10 THE SPECIAL MASTER: SW-2 is the same as SK-4?

11 MR. MERRILL: That's correct, Your Honor.

12 Also Waples' SW-30, as Mr. Echohawk suggested,
13 is the same as SK-5.

14 And, finally, Waples' Exhibit SW-1, which I
15 believe was an excerpt of the Phase II report is
16 identical to an exhibit Mr. White used, SK-8.

17 THE SPECIAL MASTER: SK-8?

18 MR. MERRILL: 8, Your Honor.

19 Since the Court has already admitted the three
20 corresponding Kersich documents into evidence, I
21 will not offer SW-1, SW-2, and SW-30.

22 I would offer for purposes of cross-examination
23 and impeachment the following exhibits, and I will
24 give for Mr. Salazar's convenience, Your Honor, the
25 exhibit number and some short description of what

1 the exhibit is.

2 The first one is Exhibit SW-6, which is a copy
3 of the infiltration report for Hole No. 6 on the 312-
4 acre tract we have been discussing both yesterday
5 afternoon and today.

6 MR. ECHOHAWK: Is that 7-19?

7 THE WITNESS: Yes.

8 MR. MERRILL: I believe so, Tom. I'm not sure.

9 THE WITNESS: Yes, it is.

10 MR. MERRILL: I would offer Exhibit SW-7, which
11 is a report on chemical analysis of soils, for Holes
12 14 and 15, also for the same photographing tract.

13 I would offer for the same purposes Exhibit SW-8,
14 which is a copy of the soil profile log for Hole No.
15 15, also drilled on the same tract.

16 And I would offer SW-9, which is another report
17 on chemical analysis for soils, for Photo 279-256.
18 That's the one that shows the 187.SAR.

19 And those are all of the exhibits that pertain
20 to that particular photo and tract, Your Honor.

21 THE SPECIAL MASTER: Are those all the exhibits
22 you are offering now?

23 MR. MERRILL: No, Your Honor, I have just four
24 more, I believe.

25 THE SPECIAL MASTER: All right.

1 MR. MERRILL: The first one is SW-11, which is
2 a soil profile log for Hole No. 9, and I have forgot-
3 ten the tract number, Your Honor.

4 Let me look at my notes.

5 That's for Tract 1-60-X, Your Honor, on Exhibit
6 C-188.

7 THE SPECIAL MASTER: Okay.

8 MR. MERRILL: I would offer Exhibit SW-12, which
9 is again another soil profile log for Hole No. 8, and
10 this refers to Tract 1-63-X, also on Exhibit C-188.

11 I would offer SW-13, which is an excerpt from
12 a glossary of soil scientist terms. I would offer
13 that for purposes of cross-examination and impeach-
14 ment.

15 And, lastly, I would offer Exhibit SW-14, which
16 is a report on chemical analysis on soils, which also
17 relates to Hole 8, which is also in Tract 1-63-X,
18 which is in Tract 1-63-X on Exhibit C-188.

19 That concludes my offer of exhibits in aid of
20 cross-examination, Your Honor.

21 That also concludes my cross-examination of Mr.
22 Waples.

23 THE SPECIAL MASTER: Thank you very much, Mr.
24 Waples.

25 Mr. Sachse, or Mr. Echohawk, do you have any

1 objection to the introduction of any of these?

2 MR. ECHOHAWK: May I have one moment, Your
3 Honor?

4 (Brief pause.

5 MR. ECHOHAWK: Your Honor, we make the same
6 objection that we made before at the close of Mr.
7 Kersich's examination to documents offered for the
8 purpose of impeachment; that we have no objection
9 to the documents offered for whatever they may
10 show, but we certainly don't believe that they have
11 impeached Mr. Waples, and that is for argument of
12 the lawyers at a later time.

13 THE SPECIAL MASTER: I think that's obvious.
14 If anyone does bring in anything by way of such
15 things, for example, as the definition of -- I
16 have forgotten the term --

17 MR. MERRILL: Caliche.

18 THE SPECIAL MASTER: Well, I'm not altogether
19 sure that would add anything to impeaching anyone's
20 testimony, but they are certainly not sufficient to
21 warrant a denial of using this material in evidence.
22 So I hereby will admit into evidence SW-6, -7, -8,
23 -9, -11, -12, -13, -14, which have just been offered
24 by Mr. Merrill, and they are admitted into evidence.

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(Whereupon Exhibits SW-6, SW-7,
(SW-8, SW-9, SW-11, SW-12, SW-13,
(and SW-14 were received in
(evidence.

THE SPECIAL MASTER: We have competed this
morning with the Reverend Jerry Falwell and managed
to hold our own. I wonder if we might not take a
break now, or would you like --

MR. ECHOHAWK: We have a brief redirect, Your
Honor. If I could have a few moments to --

THE SPECIAL MASTER: You may take all the time
that you need. Proceed with your redirect, Mr. Echo-
hawk.

MR. ECHOHAWK: If I could have a few moments
to get my exhibits?

MR. MERRILL: Why don't we take a few minutes'
break for Mr. Echohawk?

(Whereupon a recess was taken.

* * * * *

1 THE SPECIAL MASTER: We will convene, please.
2 Mr. Echohawk, please proceed with your redirect.

3 MR. ECHOHAWK: All right.

4 REDIRECT EXAMINATION

5 BY MR. ECHOHAWK:

6 Q Mr. Waples, I direct your attention to United States
7 Exhibit WRIR C-188, which is on the easel before you.
8 We've had some discussion during Mr. Merrill's cross-
9 examination of certain parcels that were saline or
10 sodic, had saline or sodic soils, and there was some
11 discussion as to the soil amendments and by HKM as
12 to costs and amounts. Did you determine soil amend-
13 ment requirements for any parcels on Exhibit C-188?

14 A Yes, 1-63-X had a requirement of 1.5 tons per acre
15 of sulfuric acid, which came out to be approximately
16 \$45 per acre.

17 Q Was that information transmitted to the economist
18 and agricultural engineer working on this project?

19 A Yes, it was.

20 Q I direct your attention to what's been introduced
21 as C-210. Is there any determinations made as to
22 additional soil amendments required for any parcels
23 depicted on C-210?

24 A Yes, there's a trace labeled 7-3-X, 150 acres.

25 waples - redirect - echohawk

1 There again, the requirement for sulfuric acid
2 was determined to be about one half ton per acre.
3 There again, cost of \$48 per acre, roughly.

4 MR. MERRILL: Your Honor, I would object to the
5 question and ask that the answer be stricken. I did
6 not cross-examine the witness with respect to that
7 parcel of land.

8 THE SPECIAL MASTER: Normally I would sustain
9 the objection, but we've been using very liberal
10 guidelines on each other's cross and redirect, so
11 I'll permit it.

12 Q (By Mr. Echohawk) Ross, I might ask you to again
13 look at 7-3-X as to the acreage.

14 A Pardon me... I may have mispoke here. 7-3-X is 90
15 acres. I believe I said 150 acres.

16 Q Okay. I'm not sure whether you said it or not, was
17 there a determination made as to the amount of soil
18 amendments and the costs associated therewith?

19 A Yes, there was. The determination was one half ton
20 per acre of sulfuric acid required for this land.

21 Q What is the cost associated?

22 A About \$45.

23 Q Was that information transmitted to the agricultural
24 engineer and economist?

25 waples - redirect - echohawk

1 A. Yes, sir, it was.

2 Q Mr. Waples, I place before you what's been marked
3 as United States Exhibit 228-A, 228-B and 228-C.
4 Would you please identify those exhibits for the
5 record.

6 A. Yes, sir. 228-A is 1980 land classification logs.
7 The logs that were used in the historic lands study.
8 It's one volume.

9 228-B is simply another volume of these logs.
10 As you can see, they're very massive books. They
11 were too big to go into one volume.

12 228-C are the drainage logs and the permeability
13 tests, that type of thing, the data.

14 Q Is this --

15 THE SPECIAL MASTER: On all your work? Do those
16 cover all of your work on the historic lands study?

17 THE WITNESS: Yes, as well as a portion of Mr.
18 Toedter's work.

19 Q (By Mr. Echohawk) Do those compose, in part, the
20 material generated as a result of the study you've
21 testified about?

22 A. Yes, they do.

23 Q And your conclusions are based in part on the re-
24 sults of the information contained in those three

25 waples - redirect - echohawk

1 volumes?

2 A Yes, they are.

3 Q Mr. Waples, I believe during Mr. Billstein's testi-
4 mony he introduced and identified approximately 80
5 photographs which have been referred to as the hydro-
6 graphic copies. In addition to those that were intro-
7 duced through Mr. Billstein, are there additional
8 copies or additional photos contained within that
9 hydrographic set that you used in your determinations
10 of land classification and acreages?

11 A Yes, there were.

12 Q Do you have those aerial photograph numbers?

13 A Yes, I have do. I have both the exhibit numbers and
14 the aerial photo numbers.

15 MR. ECHOHAWK: Your Honor, at this time I would
16 ask Mr. Waples to read in the corresponding exhibit
17 number, which we would attach to those aerial photos,
18 once we have them in court, and with the exhibit num-
19 bers and corresponding photo numbers.

20 THE SPECIAL MASTER: All right.

21 Q (By Mr. Echohawk) Go ahead.

22 A All right. Exhibit 227 is a photo number "6"-379-226.

23 Q Excuse me, I think that's 227-1.

24 A Oh, I'm sorry. Yes, I'm sorry, the exhibit number

25 waples - redirect - echohawk

1 is 227-1.

2 THE SPECIAL MASTER: All right.

3 A. The Exhibit 227-2 is "6"-379-228. Exhibit 227-3 is
4 "8"-379-190. 227-4 is "9"-379-152.

5 THE SPECIAL MASTER: Too fast. 227-4 is --

6 A. "9"-379-152.

7 227-5 corresponds to "11"-179-164. 227-6 is
8 "11"-179-166.

9 227-7 is "14"-179-165. 227-8 is "15"-179-39.
10 227-9 is "15"-179-41, 41.

11 227-10 is "20"-279-235, 227-11 corresponds to
12 "H4"-179-15. The last one, 227-12 is once again
13 "H4"-179-286.

14 MR. ECHOHAWK: Your Honor, at this time, as we
15 mentioned in our in-between off-the-record discussions,
16 the aerial photographs, these hydrographic copies are
17 not presently in court, they are presently being used
18 by the United States' experts in fieldwork on the
19 Reservation at the current time. We anticipate that
20 we'll have those photos in the courtroom at the next
21 session when we resume in May. And what I would like
22 to do, Your Honor, is offer these into evidence now
23 and with the hopes that either they be accepted into
24 evidence based on the fact that there's been quite a
25

1 bit of voir dire on that set of photographs through
2 Mr. Billstein and some through Mr. Waples. I believe
3 the foundation has been laid and the accuracy has
4 been determined of those photographs and they're
5 merely a continuation of a set, and just with the
6 hope that they'll be accepted into evidence.

7 THE SPECIAL MASTER: Mr. Merrill, would it be
8 agreeable with you if we were to accept these into
9 evidence now saving a qualification to that admis-
10 sion for you in the event you find some basis in
11 examining them that would raise a proper cause to
12 exclude them?

13 MR. MERRILL: Your Honor, I do have a problem
14 with that, and my problem is various of the witnesses
15 from HKM have testified that while they're doing
16 fieldwork they make notations on the maps to record
17 locations of holes, tentative land classifications
18 and the like. Since these exhibits are out in the
19 field being used, I think there's an excellent chance
20 that they're being marked on and modified because,
21 as the witnesses have testified, the process is very
22 much ongoing.

23 And I think that until the maps are brought into
24 the courtroom in their final state, that it's not
25 even appropriate to offer an exhibit which isn't

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present in court, but I know that Your Honor will entertain the offer. I would ask that you reserve ruling on the offer until the maps are brought into court and certified by one witness or another to be in their final state and we're afforded an opportunity to voir dire on any additions that may have been made since our copies were made.

* * * * *

1 THE SPECIAL MASTER: This would be the witness
2 to do that because he has a better knowledge of them
3 than anybody else.

4 MR. ECHOHAWK: The photographs that are our
5 there -- I mean, the hydrographic photos have been
6 used for various purposes. They contain various
7 information.

8 They are being used in the field now in regard
9 to other information contained on those photographs
10 unrelated to Mr. Waples' soils information, and I
11 don't think there would be any chance of any modifi-
12 cation.

13 The witnesses or the experts that are using
14 those photographs have been instructed to make their
15 notations on a separate set of blue line copies, like
16 we have all been using here.

17 THE SPECIAL MASTER: I just feel it would be
18 improper for me to admit them into evidence without
19 them being in court and giving Mr. Merrill a chance
20 to look at them. I'll have to go by that, so I'll
21 make the reservation on the admission until --

22 MR. ECHOHAWK: So I understand you are reserving
23 ruling on those?

24 THE SPECIAL MASTER: Yes, I have to. I don't
25 think I see any choice on that.

1 MR. ECHOHAWK: Your Honor, at this time I would
2 move into evidence Exhibits 228-A, -B, and -C, which
3 are the soil logs and the drainage information relied
4 upon by Mr. Waples.

5 MR. MERRILL: Your Honor, my only objection is
6 a highly technical one. I don't think they should
7 come into evidence without testimony that they fully
8 and accurately and completely represent the results
9 of the soils work of which they are a part, and
10 there's been no such testimony yet, so I don't think
11 there's a proper foundation for the exhibits as being
12 truthful and accurate with respect to their contents.

13 THE SPECIAL MASTER: I'll overrule the objection
14 and admit them. I think there is.

15 So Exhibits 228-A, -B, and -C are hereby admitted
16 into evidence.

17 (Whereupon Exhibits 228-A, 228-B
18 (and 228-C were received into
evidence.)

19 MR. ECHOHAWK: And we have reserved rulings on
20 227-1 through 227-12?

21 THE SPECIAL MASTER: 227-1 through -12, the
22 ruling regarding their admissibility into evidence
23 is reserved until they are presented in court.

24 MR. ECHOHAWK: Okay. Your Honor, I believe
25 that concludes the redirect examination of the United

1 States.

2 THE SPECIAL MASTER: Very well. Is this witness
3 to be excused subject to call of the Court with a due
4 notice?

5 MR. MERRILL: Your Honor, I have no recross-
6 examination of this witness, but I would ask that,
7 similar to the other federal witnesses who have
8 testified thus far, Mr. Waples remain under the
9 jurisdiction of the Court and subject to subpoena of
10 the Court for purposes of appearing as a part of the
11 case in chief of the State of Wyoming or any other
12 party.

13 THE SPECIAL MASTER: Is that clear, Mr. Waples?

14 THE WITNESS: It is.

15 MR. ECHOHAWK: Also, in regard to these photos
16 that the ruling has been reserved on, I wonder if we
17 could set up some sort of procedure -- do you want me
18 to give you those photographs and you see if you want
19 Mr. Waples to return?

20 MR. MERRILL: Let's do that informally, Your
21 Honor. I think we can save everybody a lot of
22 trouble.

23 THE SPECIAL MASTER: All right. We will be in
24 recess until 1:30, and at that time will Mr. --

25 MR. ECHOHAWK: Toedter.

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THE SPECIAL MASTER: -- Toedter be here?

MR. ECHOHAWK: Yes, Your Honor.

THE SPECIAL MASTER: All right.

(Whereupon the proceedings
(recessed at 11:38 a.m. to
(reconvene at 1:30 p.m.

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