4-21-1981

Trial Transcript, Vol. 42, Morning Session

Frontier Reporting Service

File 149
4400
case # 4993

case # 4993

File # 149

4400

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 SYSTEM AND ALL OTHER SOURCES, STATE OF WYOMING.	) Civil No. 4993

FILED

5/1 1981

Margaret V. Hampton CLERK

DEPUTY

VOLUME 42

Morning Session

Tuesday, April 21, 1981

ORIGINAL

APPEARANCES

FOR THE STATE OF WYOMING:	HALL & EVANS 2900 Energy Center One Building 717 17th Street Denver, CO 80202 BY: MR. JAMES MERRILL, Special Assistant Attorney General, and MR. STUART RIFKIN and MR. SCOTT KROB
FOR THE UNITED STATES OF AMERICA:	MR. JAMES CLEAR Attorney at Law Land and Natural Resources Division Department of Justice Washington, DC 20006 and MR. THOMAS ECHOHAWK Attorney at Law Land and Natural Resources Division 1961 Stout Street Denver, CO 80294
FOR THE SHOSHONE TRIBE:	SONOSKY, CHAMBERS & SACHSE 200 M. Street, N.W. Washington, DC 20006 BY: MR. HARRY SACHSE

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

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

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

MR. MERRILL: Maybe as quietly, Your Honor.

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

A Yes. We ran a mechanical analysis on a sample where that test was taken that turned out to be a loam, which is a relatively light texture.

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

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

how rapidly water will infiltrate into the surface soil. It's performed by using an ion ring. A constant head of water is kept in that ring and the amount of water that goes through a measured area, the area of that ring into the soil is monitored over a period of time. And this gives an infiltration rate.

Now, this test, which we're speaking of, has quite a low infiltration rate, which is indicative of the sodium that is in the surface at this time. However, through leaching it is felt that the infiltration rate will improve as the sodium is leached out and the soil condition is improved through amendments.

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

A One moment here.

Q It's called the sample number INF6.

A Yes.

Q The one that has an SAR of 187.9.

A Yes, it is.

Q Let me hand you Exhibit WRIRSW-6 and ask you if that document includes a copy of the infiltration test that was performed on tract 7-19X?

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

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

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

Q What do you mean by that?

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

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

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

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

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

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

Q As a what kind of agent?

A Flocculating.

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

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

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

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

* * * * *

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

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

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

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

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

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

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

waples-cross-merrill

as an application cost.

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

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

A Pardon me, yes.

Q -- for your sulphuric acid?

A Yes.

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

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

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

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

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

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

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

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

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

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

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

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

Now, many of the soils that went out of

production were due to the clay content in the soils.

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

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

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

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

A One moment, sir.

MR. ECHOHAWK: May I have that citation again?

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

A I apparently gave that back to Mr. Salazar.

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

copy.

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

A What was the page number?

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

A I don't care for the numberin: system here. "Soil Factor," yes.

Q Got it?

A Yes.

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

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

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

A No.

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

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

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

Now, this is why we don't -- excuse me -- why we do not deal with heavy clays. It just cannot get the water through the profile, and what we are talking about here is a relatively thin layer of loamy, whatever, soils, below which lies sands and gravels and cobbles, so we are talking about merely changing the structure in a relatively shallow layer of soil before we can improve the soil maeasureably from the standpoint of infiltration.

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

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

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

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

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

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

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

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

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

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

A That's correct.

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

waples-cross-merrill

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

A Certainly.

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

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

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

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

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

A NO.

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

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

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

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

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

* * * * *

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

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

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

THE WITNESS: No.

THE SPECIAL MASTER: That's not so?

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

Q (By Mr. Merrill) Ross, did the land classification standards you used, either table 1 or table 5, include some standards that would address the water holding capacity of the top of the soil?

A Yes, they do.

Q Which standards would those be?

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

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

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

Q We're talking about the factors of land classification in Exhibit SW-2. Would you please move down to 2E and tell the Court what factors you considered to ensure that the lands you classified as arable are readily susceptible to cultural operations?

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

Now, these -- these things are somewhat waples-cross-merrill

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

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

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

Q What I'm wondering first, before we start talking about specifics, is whether you consider the specific soil conditions or whether that parameter was left to the consideration of the project engineer or the economist?

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

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

waples-cross-merrill

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

A The land classifier made a determination in the field. However, as the tracts were looked at very specifically by the agricultural engineer, the soil classifier provided a flag, as it were, to the agricultural engineer that this was something to look at, something to consider.

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

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

Q What crops would those be?

A Hay and pasture.

Q Are those the only two?

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

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

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

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

THE SPECIAL MASTER: If the farmer wants to spend his time picking up stones he can sure improve his land. If fact, most of [illegible] northern France are made up of rows of hedge rows of rock on which the trees are grown, as I remember.

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

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

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

A That's correct.

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

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

Q Is that in any particular depth of the soil? Is that at the top or in the very bottom of the root zone or any particular place?

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

Q Where is it most important?

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

Q In the soil samples and the tract that you studied as part of this work, were the results of the infiltration tests typically higher or lower than the results of the hydraulic conductivity tests for the same piece of ground?

A I don't know.

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

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

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

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

THE WITNESS: Yes, sir.

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

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

* * * * *

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

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

A I don't think so, no.

Would you restate the question?

Q Yes. Let me try it.

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

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

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

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

(Off-the-record discussion.

MR. MERRILL: Thank you.

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

A Yes.

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

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

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

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

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

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

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

A Certainly it does.

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

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

Your Honor.

THE SPECIAL MASTER: Okay. Very good.

THE WITNESS: Was there a question outstanding?

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

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

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

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

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

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

with it.

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

A The nutrients. We all know that soils in the West are not as high in plant nutrients as many of the soils, say, in the Midwest. It's something that we recognize.

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

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

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

THE WITNESS: Yes, and competency, yes.

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

waples-cross-merrill

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

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

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

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

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

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

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

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

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

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

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

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

range.

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

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

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

MR. MERRILL: Yes, Your Honor.

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

A No, sir, they did not.

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

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

A Just one moment and I'll read them.

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

(Brief pause.

A Now your question is did we, in fact, do the items A through D?

* * * * *

403 WEST 24TH STREET
CHEYENNE, WY 82001
(307) 635-8280

FRONTIER REPORTING SERVICE

201 MIDWEST BUILDING
CASPER, WY 82601
(307) 237-1493

Q (By Mr. Merrill) Yes.
A Not -- not exactly, no.
THE SPECIAL MASTER: Not by their definition?
THE WITNESS: That's correct.
Q (By Mr. Merrill) Did you at any time modify the classification you made of the arable land base as a result of engineering or economic information that you obtained?
A Yes. This tract on Exhibit C-208, tract 7-19X that we've been discussing in some detail, that would have been nonarable land had not this additional analysis been done. That's a case in point.
Q What type of additional analysis was performed with respect to that tract?
MR. ECHOHAWK: Objection, Your Honor, asked and answered.
THE SPECIAL MASTER: I think it has, Mr. Merrill, has it not? I thought it was.
MR. MERRILL: May have been, Your Honor.
THE SPECIAL MASTER: Read the question again. I must admit my mind was going out to the crowds with the Reverend Falwell.

(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.

* * * * *

THE SPECIAL MASTER: Is everybody ready? Okay. Let's resume.

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

THE SPECIAL MASTER: On or off the record?

MR. ECHOHAWK: On the record.

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

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

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

THE SPECIAL MASTER: I appreciate that and --

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

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

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

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

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

MR. ECHOHAWK: That will be Saturday and Sunday?

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

THE SPECIAL MASTER: Yes.

MR. ECHOHAWK: I'll call them.

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

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

Okay, Mr. Merrill.

MR. MERRILL: Thank you, Your Honor.

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

A 1-60-X?

Q Yes.

A May I get the photo?

Q You bet.

A Okay.

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

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

Q So this soil log, SW-11, is your own work; is

that correct?

A Yes, sir, it is.

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

A Yes, it does.

* * * * *

Q (By Mr. Merrill) Okay.

THE SPECIAL MASTER: 1-26-X?

MR. MERRILL: Sixty X, Your Honor.

THE SPECIAL MASTER: All right, thank you.

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

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

THE SPECIAL MASTER: What is caliche?

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

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

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

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

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

Q Right.

A Okay.

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

A Yes, sir, I do.

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

THE WITNESS: Thank you.

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

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

waples-cross-merrill

water?

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

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

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

A Yes, sir.

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

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

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

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

Did you determine how much, if any, additional

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

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

Q For special amendments, are you saying?

A For fertilizer, yes.

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

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

Q Please do, please do.

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

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

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

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

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

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

Q May I look over your shoulder at your map?

I don't have ours with us.

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

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

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

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

THE SPECIAL MASTER: Yes.

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

THE SPECIAL MASTER: Thick?

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

THE SPECIAL MASTER: At what depth was this incurred?

THE WITNESS: If I can go to my logs?

THE SPECIAL MASTER: I wish you would because I thought you said about 36 inches earlier.

THE WITNESS: In the tract 1-60-X it was 36 inches. I believe it is deeper in the -- to the east a little bit. Just one moment.

THE SPECIAL MASTER: You needn't look, you needn't look. It's not going to be 10 to 12 inches from the surface in any event.

THE WITNESS: No, it won't.

THE SPECIAL MASTER: To where a plow would catch it in any annual cultivating soils preparation.

Q (By Mr. Merrill) Ross, did you do any other drilling or testing which would relate to the classification of tract 1-60-X?

A Not -- A classification was primarily based on the holes we discussed.

Q In determining that that tract, speaking of 1-60-X still, in determining that that tract is arable, did you assume that the caliche would not be a barrier to roots or water?

A We're assuming that the caliche can be handled, either through the -- as I say, oftentimes, very

waples-cross-merrill

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

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

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

Q Please do.

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

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

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

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

THE SPECIAL MASTER: That's right.

MR. CLEAR: So I think perhaps --

THE SPECIAL MASTER: We're premature?

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

THE SPECIAL MASTER: I see.

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

* * * * *

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

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

THE SPECIAL MASTER: I see your point.

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

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

Do you have any suggestions or thoughts on my observations?

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

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

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

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

First, we are not ready for such a meeting

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

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

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

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

THE WITNESS: Okay. The deep hole was augered,

approximately in here (indicating) --

Q (By Mr. Merrill) Now, you are indicating the --

A Excuse me.

Q -- the dot in the center of tract 163-X?

A That's correct.

Q Okay.

A To get things straight on the record.

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

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

tract-by-tract over everything every witness did.

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

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

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

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

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

A Yes, sir, I do.

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

A Yes, sir, it does.

waples-cross-merrill

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

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

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

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

A That's correct.

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

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

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

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.

* * * * *

409 WEST 24TH STREET
CHEYENNE, WY 82001
(307) 636-8280

FRONTIER REPORTING SERVICE

201 MIDWEST BUILDING
CASPER, WY 82601
(307) 237-1493

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

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

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

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

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

THE SPECIAL MASTER: Is this an alluvium --

THE WITNESS: Yes, sir.

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

THE WITNESS: Yes.

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

THE WITNESS: Right, from the Little Wind River.

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

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

Q Did Bob Toedter make that analysis?

A Yes, sir.

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

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

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

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

Q Okay. Let me try another run at it.

Are you saying that you consulted with Bob

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

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

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

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

THE SPECIAL MASTER: Off the record

(Off-the-record discussion.

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

THE SPECIAL MASTER: Yes, I beg your pardon.

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

of the sample you took?

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

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

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

Q How about native hay and pasture hay?

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

So what we're concerned with primarily is the physical condition of the soil, which deterioriates when large amounts of sodium are present.

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

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

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

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

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

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

THE SPECIAL MASTER: I'll give you a couple

minutes; go ahead.

MR. MERRILL: Thank you.

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

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

MR. MERRILL: He's going to need the photograph because it contains information not depicted on these exhibits.

THE WITNESS: "11"-166?

MR. MERRILL: Yes.

MR. ECHOHAWK: One sixty-six?

MR. MERRILL: Yes.

(Brief pause.

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

A Yes, sir.

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

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

Q Of Township 2 North, Range 3 West?

A That's correct.

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

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

Perhaps I could show this to Counsel.

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

A Okay.

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

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

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

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

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

waples-cross-merrill

tract 25-3-X on Exhibit C?

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

* * * * *

409 WEST 24TH STREET
CHEYENNE, WY 82001
(307) 635-8280

FRONTIER REPORTING SERVICE

201 MIDWEST BUILDING
CASPER, WY 82601
(307) 237-1493

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

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

THE SPECIAL MASTER: To an opening that you referred to on C-48, but I'm sure there is no question about what land he is talking about in the witness' mind, is there?

THE WITNESS: No, there isn't.

THE SPECIAL MASTER: Okay, would you answer that?

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

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

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

THE WITNESS: The future?

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

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

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

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

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

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

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

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

THE SPECIAL MASTER: All right.

MR. MERRILL: My questions to the witness concerned the justification for the piece of nonproject land that's adjacent to what may be future irrigated lands.

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

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

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

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

A. Very little water is going to be contributed from a -- whatever a 30-acre parcel -- this is not a reasonable concern.

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

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

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

I used as an exhibit in aid of cross-examination Waples' SW-2, which is, indeed, the same exhibit as Mr. White used in the cross-examination of Mr. Kersich, and in his cross-examination it was labeled SK-4.

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

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

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

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

THE SPECIAL MASTER: SK-8?

MR. MERRILL: 8, Your Honor.

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

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

the exhibit is.

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

MR. ECHOHAWK: Is that 7-19?

THE WITNESS: Yes.

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

THE WITNESS: Yes, it is.

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

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

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

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

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

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

THE SPECIAL MASTER: All right.

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

Let me look at my notes.

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

THE SPECIAL MASTER: Okay.

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

I would offer SW-1 , which is an excerpt from a glossary of soil scientist terms. I would offer that for purposes of cross-examination and impeachment.

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

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

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

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

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

objection to the introduction of any of these?

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

(Brief pause.

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

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

MR. MERRILL: Caliche.

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

(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. Echohawk.

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.

* * * * *

THE SPECIAL MASTER: We will convene, please.

Mr. Echohawk, please proceed with your redirect.

MR. ECHOHAWK: All right.

REDIRECT EXAMINATION

BY MR. ECHOHAWK:

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

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

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

A. Yes, it was.

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

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

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

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

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

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

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

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

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

Q. What is the cost associated?

A. About $45.

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

A. Yes, sir, it was.

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

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

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

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

Q. Is this --

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

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

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

A. Yes, they do.

Q. And your conclusions are based in part on the results of the information contained in those three

volumes?

A. Yes, they are.

Q. Mr. Waples, I believe during Mr. Billstein's testimony he introduced and identified approximately 80 photographs which have been referred to as the hydrographic copies. In addition to those that were introduced through Mr. Billstein, are there additional copies or additional photos contained within that hydrographic set that you used in your determinations of land classification and acreages?

A. Yes, there were.

Q. Do you have those aerial photograph numbers?

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

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

THE SPECIAL MASTER: All right.

Q. (By Mr. Echohawk) Go ahead.

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

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

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

is 227-1.

THE SPECIAL MASTER: All right.

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

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

A. "9"-379-152.

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

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

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

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

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

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

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

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

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.

* * * * *

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

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

They are being used in the field now in regard to other information contained on those photographs unrelated to Mr. Waples' soils information, and I don't think there would be any chance of any modification.

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

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

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

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

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

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

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

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

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

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

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

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

States.

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

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

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

THE WITNESS: It is.

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

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

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

MR. ECHOHAWK: Toedter.

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.

* * * * *