4-21-1981

Trial Transcript, Vol. 43, Afternoon Session

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File 150
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case # 4993

File # 150

4401

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

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VOLUME 43

Afternoon Session

Tuesday, April 21, 1981

ORIGINAL

THE SPECIAL MASTER: Please come to order.

MR. MEMBRINO: Your Honor, the Government calls as its next witness Robert Toedter.

THE SPECIAL MASTER: All right. Mr. Toedter, will you please stand up and raise your right hand and be sworn.

ROBERT TOEDTER

being first duly sworn, was examined and testified as follows, to wit:

DIRECT EXAMINATION

BY MR. MEMBRINO:

Q Would you please state your name.

A My name is Robert J. Toedter.

Q And you address?

A 3909 Bluebird Street, Billings, Montana.

THE SPECIAL MASTER: What street?

THE WITNESS: Bluebird.

Q (By Mr. Membrino) What is your occupation, Mr. Toedter?

A It's an agricultural engineer.

Q And could you describe the educational background you have leading to your occupation as an agricultural engineer?

A Yes. I have a Bachelor of Science in agricultural

engineering from the University of Idaho.

Q Have you done any post graduate work?

A Yes, I have. During the summer of 1970 I attended a soils scientist institute sponsored by Colorado State University in Fort Collins, and it was a program between the U.S. Bureau of Reclamation and the University in order to update the level of education for both land classifiers and drainage engineers within the Bureau of Reclamation.

Q Are you presently licensed as an agricultural engineer?

A Yes, I am.

Q Which state is that?

A The State of Washington. I was licensed in 1975.

Q Do you belong to any professional societies?

A Yes, I do. I belong to the International Congress of Irrigation and Drainage, and I also belong to the American Society of Agricultural Engineers.

Q Where are you presently employed?

A I am presently employed with HKM Associates in Billings, Montana.

Q Can you tell me what work background you had

between the time you left school and the time you were employed at HKM?

A After completing my college training I joined the U.S. Bureau of Reclamation in Bismark, North Dakota on the Garrison Project.

THE SPECIAL MASTER: What year was that?

THE WITNESS: In 1969. Upon starting my work effort there, that was my rookie assignment, and I got deeply involved in the drainage investigation for that unit. The project was authorized and we were out classifying or the land classifiers were out classifying land, and I participated in a follow-up drainage investigation for that program.

Q (By Mr. Membrino) How long were you working up at -- on that project?

A I worked three and a half years.

Q And following that what did you do?

A Following that I transferred to the Columbia Basin Project.

Q Is that also the Bureau of Reclamation?

A Yes, it is, at LaFreda, Washington. I was assigned to the Pasco Drainage Branch in Pasco, Washington.

Q What were your responsibilities there?

A My responsibilities again were as a drainage engineer. What falls under that assignment, I was assigned the investigation of two major blocks of irrigated land within the project to investigate, to determine the level of a water table within these areas and also the drainability of the materials within the area.

Once that was completed I proceeded on into the design and layout phase. Upon completion of that I presented my work both to a committee of specialists within the Bureau at the LeFreda office and to the farmers who had the signoff on the project prior to any further work efforts.

Q When you talk about the design and layout, you're talking about the drainage system design and layout?

A That is correct.

Q How long were you at the -- there at Pasco?

A I was there for approximately nine months.

Q And would you tell the Court what you did following your work there?

A Okay.. I transferred to the Chief Joseph Dam Project in North Central Washington. My reason

for leaving the Columbia Basin Project was to get an opportunity to expand my area of work efforts. On tne Chief Joseph Dam Project I was the coordinator for the drainage within the project up there. They had just newly initiated a new program and also I was responsible for the initiation of an irrigation management services program.

Q Could you tell the Court a little bit about what irrigation management system is all about.

A Okay. Irrigation Management Services Program was a program that was developed by the Reclamation as an attempt to help local growers to better manage their water resources. This was done right at the farm level. What we attempted to do by utilizing their computer program was to make a recommendation for these guys of the amount of water to apply and also the time to apply it.

Q What would the effect of that be?

A The effect of the overall program was in -- was an attempt to reduce the quantity of water being utilized within the irrigation project.

Q That would improve irrigation efficiency?

A That's correct. It also generally decreases some of the drainage problems that occur on the projects too.

Q How long were you there at Chief Joseph?

A I was there for two and a half years. I saw seven of the nine miles that I had designed constructed while on the project.

Q That's the seven of nine miles of drainage system?

A Yes, that's correct.

Q And you then left that project?

A Yes. I left that project to become Irrigation Management Services coordinator at the Upper Missouri regional office at Billings, Montana.

Q And what year was that?

A That was in -- it was between 1975 and 1976.

Q Did you assume further responsibilities with this transfer or were you doing the same work?

A I assumed a little bit different responsibilities with this transfer. I was no longer associated with drainage in the project. However, I became totally involved with Irrigation Management Services Program and had some identification with on-going operation maintenance projects on

irrigation districts throughout that region, which included Wyoming, South Dakota, North Dakota and Montana.

* * * * *

Q (By Mr. Membrino) Did you have occasion to do some work down at Riverton?

A Yes, I did. The Riverton area was probably the largest on-going irrigation management service program that the Bureau of Reclamation had at that time.

THE SPECIAL MASTER: In that district?

THE WITNESS: It was out of the Riverton Unit.

THE SPECIAL MASTER: The largest --

THE WITNESS: Out in the Midvale Irrigation Division.

THE SPECIAL MASTER: But it was the largest that the Reclamation had in what district, out of the Billings office? It wasn't the largest in the nation?

THE WITNESS: It was one of the largest programs in the 17 western states at that point in time. Since some of the areas -- other areas have become larger.

Q (By Mr. Membrino) Now, when did you join -- well, when did you join HKM? Was it following your work up in Billings that you just described?

A Yes, it was. It was in October of 1976.

Q And you were hired into what position there?

A I was hired as a senior drainage engineer.

Q What were some of your responsibilities for HKM?

A Some of my responsibilities included participation in the development of the specifications for the Buffalo Rapids Pumping Plant, which is a pumping plant of about 150 cfs.

Some of my other work includes some small drain design projects in the area.

Other work responsiblities have included the drainage investigational efforts on the Wind River Indian Reservation, likewise on Fort Berthold and the Jicarilla Reservations.

Q Were you involved in any other work related to Indian Reservation and water rights besides what you have just described while working at HKM?

A No, I have not been.

Q Mr. Toedter, I gave you what's been marked for identification as United States Exhibit WRIR C-230 and ask you to identify that, please.

A Yes. This is a copy of my resume.

Q It fairly and accurately displays your academic

and professional credentials?

A Yes, it does. We've probably expanded a little bit more into some of my previous experience prior to joining HKM than what the resume shows.

MR. MEMBRINO: Your Honor, at this time I move Mr. Toedter's qualifications as an agricultural engineer specializing in irrigation and drainage and request that he be permitted to testify as an expert in this case.

MR. WHITE: May I voir dire, Your Honor?

THE SPECIAL MASTER: Yes.

VOIR DIRE EXAMINATION

BY MR. WHITE:

Q Mr. Toedter, you received your B.S. in ag engineering from Idaho in 1969?

A That is correct.

Q During your three and a half years in Bismark working on the Garrison Project, how many acres were you working on with respect to drainate?

A Okay. I was in the main office at Bismark, and we had three field offices within the project, and I sat under the individual that was directly in charge of the program, and the direct evaluation

was for 250,000 acres within the project, of which I got to see a minor or a major portion of the investigation of all these lands.

Also, I personally was involved in some of the drainage investigational efforts of a million-acre review over in the Red River Valley in North Dakota.

Q How much actual field work did you do out of the Bismark office?

A I was in the field from a third to a half the time during the course of the year.

What they would do is send me, mainly for training purposes as much as anything, out to the field offices in order to get some experience.

Then I came back into the local office when they needed help in there.

Q So you spent about half to a third of your time for that three and a half years in the field?

A That's correct.

Q Covering rougly 250,000 acres --

A Right.

Q -- is that right? You mentioned that you'd been licensed as an agricultural engineer. Is the licensing process for that any different than toedter-voir cire-white

that for a professional engineer?

A No.

Q Are they the same thing? Would you tell --

A I'm a licensed professional engineer in agricultural engineering in the State of Washington.

Q In your work in the Columbia Basin Project, you indicated that you were assigned the investigation of two major blocks of irrigated land.

What was the combined total of those blocks of land in terms of acreage?

A Okay. The acreage for one was about 1,500 acres. I'm just guessing, plus or minus, maybe 100 to 150 there.

And the other one was about 4,000 acres.

Q And how much time did you actually spend in the field during that nine months?

A On this particular assignment I didn't spend a great deal of time in the field. Most of my activities were spent in the office.

However, this generally wasn't the practice, but due to my previous investigational experience on the Garrison Diversion area, we got in a pinch, toedter-voir dire-white

and I had to follow through and obtain some additional field data, and so I went out in the field and supervised some of the guys in order to get the work done.

Q During your two and a half years with the Chief Joseph Dam Project in North Central Washington, how much of your time was spent working on drainage?

A I'd say probably 75 percent of my time was spent on drainage, and the balance was spent on the irrigation management services.

Q And how much of your drainage time did you spend in the field?

A I think for the clarity of the record here I should point out what I did on that job.

Upon arriving at Manson, I started an investigational program which included the development of a drilling program in order to determine both the lands that were wet and also the soils present in these areas.

Upon obtaining that information, I took it and developed drain layouts which were to be used in order to maintain the water level.

Then once that was completed and the toedter-voir dire-white

appropriate reviews were made with people in the Pacific Northwest Regional Office at Boise and the Engineering and Research Center at Denver, I supervised a survey crew in order to survey these streams.

Once the surveying was complete, I worked with technical people within the office to develop plan and profile drawings of these drains for specific purposes.

Once that was completed, I prepared a compilation of design data. Once the design data and plan and profiles were compete, this documentation was sent to the regional office for preparation of specifications for construction of the job..

Upon or while the specifications were being prepared, there was coordination back and forth obtaining additional field data for these guys to get everything wrapped up into a specification.

Once the specifications were prepared, the bid opening was held and the job was let. I got involved in the drain, the actual drain construction during the job, and as I mentioned before, as one of the inspectors, I participated in a portion of toedter-voir dire-white

an inspection of seven of the nine miles constructed within the job.

Q Back to the original question: How much time did you spend in the field and, say, prior to your drain construction inspection work?

A Off and on, about six months.

Q And how many acres were involved in the lands for which you developed the drainage?

A Approximately 8,000.

Q You mentioned that you developed a drilling program for lands which were wet?

A Yes.

Q What's the difference between drilling programs for lands which are wet and lands which are dry?

A Well, there's no real point in drilling lands that are dry.

THE SPECIAL MASTER: Why don't you define for us how do you describe lands that are wet?

THE WITNESS: Okay. The lands that we were concerned with are lands that have the water table up either in the root zone or very close to; in other words, a situation where the water table is within four feet or less of the ground

surface were those lands that we described as being wet lands.

* * * * *

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Q (By Mr. White)) What do you mean by plan profile drawing?

A Plan profile drawings?

Q Yes. Isn't that the term you used in describing your work?

A Yes. What a plan profile drawing does is it's a drawing, anelevation drawing that shows the center line of a pipeline. You take the ground surface and plot it according to elevation on a piece of paper. Then you plot the grade of your drain and underneath your ground surface and then you show all your pertinent design facts; pipe size, manholes. Now, in the plan view, that merely is just the picture of the top of the center line of a drain system, to looking at an aerial photograph. Generally the center line is shown in the middle, you show your right of way limitations that the contractor has to live within, out to each side of a pipeline, and then any pertinent physical features that the contractor may be interested in knowing about during construction.

THE SPECIAL MASTER: Is that your final act before the design stage is complete and is sent toedter-voir dire-white

back to headquarters for preparation for specs, is that your last stage?

THE WITNESS: Yes, that would be the last portion of the design phase.

Q (By Mr. White) With respect to your work in 1975 and 1976 in the Billings office, could you describe -- Strike that, let me start again.

You told the Master that, I believe you worked on the Midvale District in terms of irrigation management program?

A No, I did not.

Q Okay. I'm not certain. Where did you work?

A Okay. I worked in the Upper Missouri regional office.

Q What work did you do in the Riverton area then?

A Okay. My involvement with the Riverton area was just as a liaison between the individual who was coordinator of that project --

THE SPECIAL MASTER: Which project?

THE WITNESS: The Midvale Project.

THE SPECIAL MASTER: Third division or do you remember?

THE WITNESS: Yes. Actually the Midvale and third division were all participants in the

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program.

MR. WHITE: You got ahead of me, Your Honor. That was my next question.

THE SPECIAL MASTER: I'm sorry.

MR. WHITE: I was just joking.

Q (By Mr. White) Did you develop the Irrigation Management Program or system for the third division?

A No, I did not. It was on-going.

Q With respect to that Irrigation Management Program for the Third Division, was it successful or unsuccessful?

A I think we should clarify that. It's not just the Third Division, Sandy. It's the whole irrigation district, which includes the Midvale District and the Third Division.

Okay. In answer to your other question, irrigation management, not through the fault, because of the technical portion of the program has been sound, there has been some problem in terms of getting acceptance within the program by the farmers. Now, if the federal government were to foot the bill 100 percent of the way there would probably be 30 percent participation

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at least, and maybe greater than that within an irrigation district. However, when it comes to paying a charge of three to five dollars an acre, some farmers are somewhat hesitant to go on ahead and dig money out of their own pockets in order to pay for a program and the service that's involved with that.

Q Okay. What do they get when they pay for the program that's --

MR. SACHSE: Objection, Your Honor. I object to this line of questioning as being beyond the appropriate scope of voir dire. If Mr. White wants to introduce Mr. Toedter as his witness to testify about factual matters in the Third District he can do it after Mr. Toedter has testified on direct. If he wants to cross-examine Mr. Toedter about anything he can do it. But the purpose of the voir dire is simply to determine whether Mr. Toedter is as he claims to be and as the United States presented him to be, an expert in irrigation engineering. And the voir dire should appropriately be limited to that and it should be a rather short matter. It's then done on that one single

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issue, is he qualified as an expert.

THE SPECIAL MASTER: I agree with that.

MR. WHITE: Your Honor, I'd like to state that if the objection is sustained I would move to strike all that portion of the voir dire which went to irrigation management systems.

THE SPECIAL MASTER: Your questions what do they get for their operation or management fee. That's not a competent question to ask him on voir dire.

MR. WHITE: Thank you, Your Honor.

THE SPECIAL MASTER: Your other questions are all right.

Q (By Mr. White) Mr. Toedter, in your resume, which has been marked for identification as Exhibit 230, I see that you list here drainage investigation for potentially irrigable lands on several Indian Reservations including the Crow Reservation; is that correct?

A Okay. That is correct.

Q Would you please describe the work which you did on the CRow Reservation.

A Okay. My work on the Crow Reservation was similar to that performed upon the Wind Reservation.

Generally what takes place in a determination of arable lands is the land classifiers go out, classify the land. I follow up with a review of literature of the work that's been done in a area before, scope it out for its accuracy, then get involved in a drilling program. And then after -- Once the drilling program is completed, usually we follow with a hydraulic conductivity testing program, testing the typical textures that we find within the area for their hydraulic conductivity.

Q You do the hydraulic conductivity testing after you determine the textures that are shown by the drilling program?

A Generally yes, after the typical textures are determined.

Sometimes it's coordinated at the same time. Like I might be out drilling and I'll have a tecnician under me that's doing hydraulic conductivity testing.

Q Was your work on the Crow Reservation reduced to a written report or written summary?

A Well, we prepared a preliminary report.

Q Who's we?

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A HKM --

(Brief interruption.

Q (By Mr. White) I'm sorry, was that HKM?

A Yes, HKM.

Q Did the report deal with drainage on the Crow Reservation?

A That was one of the components.

Q You testified that your work on the Crow was similar to the work on the Wind River Reservation; is that correct?

A The investigational efforts were similar.

Q How many acres on the Crow Reservation did you do drainage work for?

A I can't remember, Sandy. It's probably 40,000 acres or so.

Q I also notice on your resume, which has been identified as Exhibit C-230, that halfway down the first page, a paragraph that reads performance and coordination of a depletion study used in determination of the level of natural flow throughout the Wind River Reservation in Wyoming. This work has been introduced as part of the litigation for determination of Reservation water rights.

Would you please describe the depletion, if any, which has already been introduced?

MR. MEMBRINO: Your Honor, I object.

THE SPECIAL MASTER: Objection overruled. It's on his resume, how can I help but --

MR. MEMBRINO: Your Honor, it goes beyond the scope of what Mr. Toedter is being offered to serve as an expert about.

THE SPECIAL MASTER: One of the qualifications of his -- of his experience, assertions towards becoming an expert, and if he listed it he ought to be permitted to direct a comment on it.

MR. MEMBRINO: Your Honor, his experience is broader than what he's being offered to testify about.

THE SPECIAL MASTER: Of course it is, but his list of experience includes some performance in coordination of a depletion study used in determining the level of natural flow throughout the Reservation in Wyoming. He may have done that, but this work has been introduced as part of the litigation. If it has it's not in error, if it hasn't then that's in error, and we'd like to know that.

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MR. MEMBRINO: I do believe that portion is in error, but I would add that it is true that Mr. Toedter has worked on that issue.

THE SPECIAL MASTER: Let's let him tell us, why don't we instead of you. That's the purpose of the question.

MR. MEMBRINO: I just wanted to point out he will be testifying at a later date about that work and I think that's the appropriate time to investigate his credentials.

THE SPECIAL MASTER: All right. I'll overrule it. Do you remember the question?

THE WITNESS: Could you repeat it?

THE SPECIAL MASTER: Sure.

MR. WHITE: Why don't I try it again.

Q (By Mr. White) Would you please describe your work which was part of a depletion study on the Wind River Indian Reservation, which has been introduced as part of this litigation. I assume that means it has been introduced into evidence as part of this litigation?

A Okay. My work in depletion study -- Let me explain what the depletion study is first. The depletion study is a component part of the

hydrology work that was performed by HKM on the Wind River Reservation. My part in that work effort was to determine that portion of the water supply in the upper reaches of the Wind River Basin that is presently being depleted in order to take and make a natural flow assessment of the waters passing through the Wind River Reservation.

* * * * *

THE SPECIAL MASTER: For what purpose? To make a natural flow assessment for what purpose?

THE WITNESS: The purpose is just to determine the level of natural flow.

THE SPECIAL MASTER: I see.

Q (By Mr.White) Isn't it true, Mr. Toedter, that your depletion work, which is a part of the natural flow study or virgin flow study, has not yet been offered or admitted in evidence in this case?

THE SPECIAL MASTER: It may, but he hasn't said it has.

Q (By Mr. White) Has it been introduced?

THE SPECIAL MASTER: What does that mean?

Q (By Mr. White) When your resumé says that work has been introduced --

THE SPECIAL MASTER: In what?

MR. WHITE: As a part of the litigation for determination of the reservation of water rights.

THE SPECIAL MASTER: I'll get straight with you if you do with him. It's around here someplace.

MR. WHITE: Let's back up.

Q (By Mr. White) What does it mean, Mr. Toedter, when it says this work has been introduced as a part of the litigation for determination of the

reservation of water rights?

A. All right. That's actually in error in terms of the resumé because it hasn't been introduced formally yet.

Q. Mr. Toedter, back to your work on the Crow Reservation, were the land forms and soil textures which you encountered there similar to the land forms and soil textures that you encountered in the Wind River Indian Reservation?

A. The geology of the area was similar in nature. However, the textures of the soils that we found within the area were completely different.

Soils were considerably heavier on the Crow Reservation and deeper than what we found present in the Wind River Reservation.

THE SPECIAL MASTER: By the way, Mr. White, and Counsel, I will strike the word "introduce" from this resumé and put in the word "done", so it says this work has been done as part of the litigation for determination. I suspect --

MR. WHITE: Let me ask a couple questions to follow up on that.

Q. (By Mr. White) Mr. Toedter, isn't it true you have done depletion work for two purposes in this

litigation, natural flow or virgin flow study, and a systems study?

MR. MEMBRINO: Your Honor, I object.

THE SPECIAL MASTER: I'm about to sustain the objection to that.

MR. MEMBRINO: Thank you.

THE SPECIAL MASTER: I don't think that is in the proper province of your examining him in his expert status.

Q (By Mr. White) Mr. Toedter, is your depletion study for the virgin flow analysis done?

MR. SACHSE: Objection, Your Honor.

MR. MEMBRINO: Objection.

THE SPECIAL MASTER: I overrule the objection on that. The question was is your performance -- is your work done on the depletion study?

MR. WHITE: For virgin flow analysis.

THE SPECIAL MASTER: Is it done?

THE WITNESS: Yes, it's essentially complete.

Q (By Mr. White) Is the same thing true with respect to the systems analysis or systems study?

A No.

MR. WHITE: I have no further questions, Your Honor, and the State will have no objection to the acceptance by the Court of Mr. Toedter as an agricultural engineer.

THE SPECIAL MASTER: Thank you.

MR. WHITE: If he offers opinions outside that area, we may object though.

THE SPECIAL MASTER: Mr. Toedter, were you with -- this is more for my information and also for this case too -- were you in the Billings office at the time examinations were made of the drainage and land classification of the Polecat Addition to Heart Mountain Project in this water division?

THE WITNESS: If I understand your question correctly, I believe I left just prior to that time.

Q You left at a very propitious time.

All right. I wanted to ask some questions about that project because I lived with it for about a year and a half, and some of our representatives worked very hard on that project and had many problems to overcome, one of which is the land wasn't even owned by the United States in large part.

Okay. Well, I see no reason why I should not at this time -- do you have additional questions, Mr. White?

MR. WHITE: I was just going to say that the United States had no objection to the admission of Exhibit 230 as corrected.

THE SPECIAL MASTER: At this time I will admit --

MR. WHITE: The State of Wyoming, Your Honor. I'm sorry.

THE SPECIAL MASTER: We got thrown by what's going on across the street, and we have been -- for the record, Mr. Toedter, you are admitted as an expert in these proceedings, and your expertise is recognized.

Secondly, Exhibit WRIR C-230 is admitted into evidence.

(Whereupon, U.S. Exhibit
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THE SPECIAL MASTER: Proceed, Mr. Membrino.

MR. MEMBRINO: It is clear that Mr. Toedter is qualified to testify as an agricultural engineer specializing in irrigation and drainage?

THE SPECIAL MASTER: I believe so.

MR. WHITE: He wasn't offered for that

Okay. Well, I see no reason why I should not at this time -- do you have additional questions, Mr. White?

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THE SPECIAL MASTER: I believe so.

MR. WHITE: He wasn't offered for that

purpose, Your Honor, and we would object. If he was offered as an agricultural engineer, we have no objection, but if it's for specialization in drainage, we would have an objection.

THE SPECIAL MASTER: But he specialized in drainage, and I would admit him for that purpose, and if you want to make the objection, you can, Mr. White.

MR. WHITE: I was going to say that the work that Mr. Toedter referred to in the drainage area was work in a much smaller geographical area than that of the Wind River Indian Reservation. It was work at least with respect to field work done nowhere near to the Wind River Indian Reservation.

He had some supervisory responsibility in Billings. He acted as a liaison with people in the Riverton Project, but the point I wish to make, Your Honor, is that he may have expertise in the areas in which he has experience, the geographical areas in which he has experience, but that expertise should not extend to the Big Horn or Wind River Basin in which we all know that the drainage problems as evidenced by the

Third Division were rather peculiar and significant.

THE SPECIAL MASTER: I would conclude otherwise and feel that he is an expert for purposes also of the drainage -- for drainage problems and their reduction, and the Court may recognize him and Mr. White may take exception if he wishes.

Go ahead.

MR. MEMBRINO: Thank you, Your Honor.

DIRECT EXAMINATION (CONTINUED)

BY MR. MEMBRINO:

Q Mr. Toedter, as a senior engineer with HKM, have you been assigned to assist in the preparation of the United States' claims in this case?

A Yes, I have.

MR. WHITE: Objection. I move to strike. Which United States' claims? As we know, Your Honor, we have got several sets --

MR. MEMBRINO: I will rephrase the question.

THE SPECIAL MASTER: You don't have to rephrase it. The objection is overruled.

We are going to be a little less patient

on these things only in the interest of concluding the litigation when the matter is so obvious and the claims are so complex anyway, as Mr. White says.

I don't think it makes any difference. He's helped with some of them obviously.

Go ahead, Mr. Membrino.

MR. WHITE: Your Honor, can I make a statement for the purpose of the record?

For that purpose, I would simply state the inquiry was to whether they were claims asserted in the Statement of Claims or any one of several claims asserted during the testimony given in this action.

THE SPECIAL MASTER: As the Special Master I still say it is really irrelevant.

Q (By Mr. Membrino) Mr. Toedter, have you had a role in the land classification program on the Wind River Reservation to which Mr. Kersich and Mr. Waples have earlier testified?

A Yes, I have.

Q What were your responsibilities?

A Okay. My responsibilities were as a drainage engineer. However, we have close cooperation

within the office, and I have worked closely with Mr. Waples and also Mr. Kersich on the job.

Q Mr. Toedter, I show you what has been introduced in evidence as United States Exhibit WRIR C-226, the historic land study that was introduced through Mr. Waples, and I direct your attention to table 1.

A Yes.

Q Would you identify that table, please?

A Table 1 is a set of land classification standards that were developed by HKM for the Wind River Reservation.

* * * * *

Q (By Mr. Membrino) Did you ever have a role in the preparation of those land classification standards?

A Yes.

Q Which ones?

A My main role was in the area of the development of the latter portion of the standards.pertinent to drainage. They are in the areas of sub-surfacehydraulic conductivity and soil depth to barrier.

Q Those are located on what page of that table?

A On Page No. 7.

THE SPECIAL MASTER: How do you distinguish what you've been saying about Page 7 from the table I thought you were testifying to about on Page 5, what you say about all three of them, 5, 6 and 7?

THE WITNESS: Okay. What I'm saying is the part that I played in the development of the total standards is on Page 7, and there is a section entitled "Drains" at the top, and my participation was in the second item identified as "Subsurface Hydraulic Conductivity", and then the third item which is identified as "Soil Depth

to Barrier".

Q (By Mr. Membrino) Could you tell us a little bit about why it's important to consider drainage in irrigating agricultural development?

A Yes.

THE SPECIAL MASTER: Do we need to have that or is that in the area of something that reasonable men ought to have sufficient knowledge of that we may proceed?

MR. MEMBRINO: We may proceed, Your Honor.

THE SPECIAL MASTER: Any objection? If we don't, please restate the question and go ahead.

Q (By Mr. Membrino) How did you go about selecting the hydraulic conductivity in that table that's listed as one-tenth of an inch per hour and the depth to barrier of six feet?

MR. WHITE: I'll object to the question, it's already asked and answered by Mr. Kersich. It was his professional judgment that ended up in the standards that were established for his work, and I believe the same thing is true of Mr. Waples.

toedter-direct-membrino

MR. MEMBRINO: Your Honor. --

THE SPECIAL MASTER: Try to reframe your question, bring out any personal knowledge of this witness, what he did find.

Q (By Mr. Membrino) Mr. Toedter, you said you participated in the selection of the standards, these criteria for the standards.

A That's correct. I was a very important component in the development of these standards.

THE SPECIAL MASTER: Tell us what you did.

Q (By Mr. Membrino) Could you tell us what you did?

A Okay. My involvement in the development of these standards is both using my previous professional experience and in considerable discussion with some of the people that I'm personally acquainted with in the engineering and research center down here at the Bureau of Reclamation in Denver.

We discussed what the minimum hydraulic conductivity would be, which would enable sustained irrigation on a project. And we arrived at the conclusion that one-tenth of an inch an hour was about as low as you could go. So as a consequence, we said this is our standards.

Q What happens if you go less than a tenth of an

inch per hour as a physical matter?

A Well, oftentimes what ends up happening is you can place drains in the ground, they'll be somewhat functional, but they won't maintain the water table below the root zone. So you kind of end out in no man's land where you've designed a drain in an area but it doesn't really do the job.

Q Is that because -- because at the rate of a tenth of an inch per hour the water does not move fast enough?

A Yeah, just isn't fast enough into the drain to do the job.

Q By the same token, how did you select the six feet?

A The six feet is kind of an economic consideration. You're trying to maintain the water level below the root zone and so as a consequence you have to move some lateral heights, which essentially the energy that it takes to move the water over to the drain when you're in between the two drains, so you have to have about that depth in order to sufficiently move the water over to the drain and get rid of it.

toedter-direct-membrino

MR. WHITE: I move to strike the answer, Your Honor. Both Mr. Kersich and Mr. Waples were asked about economic standards and they indicated none were made. This witness has been asked and he indicated they were made. I think the record ought to be square on that point.

THE SPECIAL MASTER: Objection is overruled. The record speaks for itself. We may draw our conclusions there from the testimony.

Q (By Mr. Membrino) Mr. Toedter, I direct your attention to footnote 3 in that table which reads: "With these parameters (depth and hydraulic conductivity) a drain spacing should be at least 200 feet." Did you -- Were you involved in the writing of that footnote?

A Yes, I was. Again, this involved the sum of my previous professional experience and discussion with the people in the engineering and research center.

Q Is it your testimony that 200 foot drain spacing is what would be necessary to drain lands that had a hydraulic conductivity of a tenth of an inch per hour and a six foot depth to barrier?

A Well, it doesn't quite work that way. If you have a tenth of an inch per hour you have to have a depth to barrier of 30 feet or so in order to meet these 200-foot limitations, and if you have a six foot depth to barrier you have to have about an inch per hour hydraulic conductivity.

Q That's -- In other words, ten times the hydraulic conductivity that your minimum sets forth?

A Yes, that's right.

Q Well, if the 200-foot spacing is not a function of a tenth of an inch per hour hydraulic conductivity and six feet depth to barrier, what is it, what is its function in these standards?

A Well, what it is is it's the lowest drain spacing that we allowed on all the arable lands, and it looks like it's somewhat hard to make a decision as to what level of hydraulic conductivity that you have to have and what the depth to barrier is in order to obtain a 200 foot drain spacing.

What I did is we have a computer program at HKM that goes through a quick irrigation scheduling analysis, and then utilizing this you

determine the quantity of deep perc that occurs at a given time and the amount, and you grind that on into your drain spacing analysis. Then I took and made comparisons throughout, a number of iterations where I used different depth to barrier and different hydraulic conductivities, and I plotted out the curve on a piece of graph paper that showed the level of -- or where that 200-foot drain spacing would be relative to a given depth to barrier and hydraulic conductivity.

Q Having participated in the development of the drainage standards you just discussed, did you use them in investigating the availability rather than the arability of lands in the Wind River Reservation as testified to by Mr. Kersich or Mr. Waples?

MR. WHITE: Excuse me, could we have the question read back? You're facing away from me.

THE SPECIAL MASTER: Would you read it, please.

(Thereupon the following (question was read back as (follows: "Q Having (participated in the develop- (ment of the drainage standards

(you just discussed, did
(you use them in investigating
(the availability rather than
(the arability of lands in
(the Wind River Reservation
(as testified to by Mr. Kersich
(or Mr. Waples?"

MR. MEMBRINO: I should clarify that question. It was the arability of lands, the investigation of the arability of lands on the Wind River Reservation.

Q (By Mr. Membrino) Do you have the question?

A Okay. Yes. All of the lands within the Wind River Reservation were reviewed and subjegated to these standards. Some lands ended up falling out as a result of the fact that they did not meet these standards, but every parcel of land within the Reservation was put to this test.

Q Did your investigation include an office evaluation?

THE SPECIAL MASTER: Include what, Mr. Membrino?

MR. MEMBRINO: An office evaluation?

THE SPECIAL MASTER: An office evaluation?

MR. MEMBRINO: In other words, not in the field but in the office.

THE WITNESS: Okay. Yes.

toedter-direct-membrino

THE SPECIAL MASTER: What's the difference between an evaluation made in the office and one made in the field if he's evaluating --

MR. MEMBRINO: Well, the approaches are different, Your Honor. There would be some --

THE SPECIAL MASTER: Which, approaches in the report or approaches in the work?

MR. MEMBRINO: Approaches in -- approaches in the work by applying, for example, previously acquired information, studying literature, studying a theory of drainage and going into the field and doing empirical investigations.

THE WITNESS: You want me to answer the question? Okay. Actually there were two levels of office evaluation. The first level was merely a level of gathering materials and then evaluating those materials that were gathered. So I had some idea of what to expect prior to entering the field.

The USBR did a study in 1962 on the Wind River Basin there, studying lands and most of these lands were within the same study areas which Mr. Kersich testified to during his testimony.

Q (by Mr. Membrino) When did you make that first review of the USBR work?

A This was done in the fall of 1978.

Q Did you also do a field investigation?

A Yes, I did.

Q When did that occur?

A Okay. We started in the fall of 1978. We got snowed out of the field and so we went back in July of 1979 and worked for a couple more weeks. Then tne following fall we hadn't performed any work at all in the Big Horn Flats at all. So we went back into that area and did another investigation and then last fall we went into the lands that were project lands that Mr. Waples testified to and did another drawing program.

Q Could you outline briefly the method you used when you get out in the field and do your investigation?

A Yes. Generally what we do is I, of course, take all the available data with me and review that as I go. I get out on the ground, drive around, kind of get a feel for the topography of the area, the land forms. I take the geology map with me,

similar to this one shown here, Exhibit C-33. That gives me an indication of some of the materials that I'd expect to find in the field. Then after that I start my drilling activities and generally it's done on the basis to confirm what I've already found in the field or in cases where there's no material at all available, then it's identified where it's in the area.

* * * * *

Q. (By Mr. Membrino) You mentioned that you had reviewed the Wind Division report that had been prepared by the United States Bureau of Reclamation.

Did that report contain any information on hydraulic conductivity and depth to barrier?

A. Okay. That report contained a number of profiles of drill holes that were logged in the area. The hydraulic conductivity as introduced in Mr. Kersich's testimony wasn't very good.

I knew the individual personally who was on the Reservation at that time, is now presently the drainage engineer on the Garrison project in Bismarck, North Dakota, and there's some limitations in some of the results that those gentlemen obtained.

One of the problems is the --

MR. WHITE: Your Honor, I would object to the testimony of the witness unless it's based on his personal knowledge.

MR. SACHSE: Your Honor, he's an expert witness. Expert witnesses have the right to testify as to hearsay.

THE SPECIAL MASTER: Continue with your response.

THE WITNESS: Okay.

A. There was some problem with the casing that the guys used and they crossed across textural zones which makes it very difficult to determine what the hydraulic conductivity is for a particular texture.

Now, this is very important to us in the drainage business to identify and associate a given hydraulic conductivity for a particular texture.

Q. (By Mr. Membrino) Now, what you say -- just a moment ago you said that when Mr. Kersich testified, the hydraulic conductivity was not very good. He's not talking about HKM's work. He's talking about -- Are you referring to the USBR report on the Wind River?

A. Yes.

MR. WHITE: Objection, Your Honor. What Mr. Kersich is talking about is known to only two entities, Mr. Kersich and God, and not Mr. Toedter.

THE SPECIAL MASTER: What Mr. Toedter said Mr. Kersich was talking about, Mr. Toedter can tell us what he thinks -- Mr. Toedter can tell us what he thinks Mr. Kersich was talking about.

Was he talking about the distance of subsurface hydraulic conductivity as not being very good, or were you talking about his report concerning conductivity not being very good? You left an ambiguity

there.

THE WITNESS: We are going to have to clarify this point. The rate of hydraulic conductivity.

THE SPECIAL MASTER: Was not very good?

THE WITNESS: Was not too good, the results.

THE SPECIAL MASTER: You weren't talking about Mr. Kersich's work?

THE WITNESS: No, I'm not talking about -- no, I'm talking about the USBR work.

MR. WHITE: Your Honor, I would move to strike the answer for lack of foundation. How does this witness know that it's not very good? It's a conclusion --

THE SPECIAL MASTER: You might ask him, if you wish, Mr. Membrino, but I thought he explained it.

MR. MEMBRINO: I believe, Your Honor, he has already testified that he reviewed the U.S. Bureau of Reclamation work, took it into the field with him prior to making his own determination of hydraulic conductivity and depth to barrier, so I do think he's competent to speak about it.

THE WITNESS: I believed that Mr. Kersich introduced the memorandum into the record concerning the subject.

THE SPECIAL MASTER: He may have, but this case

is burgeoning with evidence and exhibits and paper-work beyond the comprehension of many minds to fathom, including mine, but let's go ahead.

Q. (By Mr. Membrino) If there were those deficiencies in the Bureau of Reclamation work, how did you make use of them?

MR. WHITE: I object to the question because it's based on a fact not in evidence, Your Honor. He can rely on that to reach some kind of opinion or conclusion perhaps.

THE SPECIAL MASTER: Something does not have to be in evidence in this case to warrant him having utilized it in his work, for goodness' sake. The objection is overruled. He may answer.

Q. (By Mr. Membrino) Mr. Toedter, did you make a review of the USBR report?

A. Yes, I made a report of the USBR data, and I did not use the Bureau of Reclamation hydraulic conductivity results.

Q. Why not?

A. The reason why, as I stated earlier, is because of the fact that the results were so low.

Q. How do you mean the results were so low?

A. Well, the results, because of the fact that there

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were problems with screens that they were using at the time, there was also some problems with barrels running out of water,and they didn't know where they were at. It was just a combination of little errors that make the data questionable, so as a consequence, I didn't rely on that data at all.

Q. Did you make your own examination?

A. Yes, I did, and we ran our own hydraulic conductivity tests and used them accordingly for our study efforts.

Q. Did you compare the hydraulic -- your own hydraulic conductivity and depth to barrier work with that of the results contained in the Wind Division report?

A. Yes, I did, and they were low. This is what raised the question originally.

Q. When you say they were low, what do you mean by that, that they were lower -- what was lower than what?

A. Well, they were lower for a given texture than the results obtained by HKM in our investigational efforts.

Q. How much land was the subject of your investigation?

A. Okay. We investigated 84,000 acres of future land, as testified to by Mr. Kersich, and approximately 7300 acres of project lands, as testified to by Mr. Waples.

Q. Now, you made conclusions about the hydraulic conductivity and depth to barrier regarding those lands?

A. Yes, I did, based on the standards.

Q. Do you know whether your conclusions have been incorporated into Mr. Kersich's and Mr. Waples' conclusions about which they have already testified?

A. Yes, they were a component of the analysis.

Q. Have you made a record of the facts and data on which your conclusions are based as to hydraulic conductivity and depth to barrier?

A. Yes, I have.

Q. Are some of those facts and data already in evidence?

A. Yes, they are. The land classification logs and the deep drill holes were introduced for the future lands in Mr. Kersich's testimony, and the same items were introduced for the project lands or FIPs during Mr. Waples' testimony.

MR. MEMBRINO: Your Honor, for the record, I point out that those items are United States' Exhibits WRIR C-228-A, -B and -C, and U.S. Exhibit WRIR C-147-A, -B and -C.

The former deal with the historic lands and the lateral --

THE SPECIAL MASTER: Are they back in the control

of the Special Master's office?

MR. WHITE: They are right here, Your Honor.

THE SPECIAL MASTER: All right. Are you returning them or are they staying with the State --

MR. WHITE: Your Honor, only Exhibits 147-A, -B and -C were in the control of the State and --

THE SPECIAL MASTER: Do you want to keep them, Mr. White, for a while longer?

MR. WHITE: We would like to, Your Honor. We are still checking for things we don't have, but they are available in the courtroom.

THE SPECIAL MASTER: Very well.

MR. MEMBRINO: At this time, Your Honor, I would like a moment to set up an exhibit.

THE SPECIAL MASTER: All right. We have been at it for a good long while. Let's take a ten-minute break.

(Whereupon a recess was taken.

* * * * *

THE SPECIAL MASTER: Please come to order. If it will help any we can get another easel, but I don't know what help that might bring, or is it all right the way it is?

MR. MEMBRINO: I think we're all right for the moment.

THE SPECIAL MASTER: Then proceed, Mr. Membrino.

Q (By Mr. Membrino) Mr. Toedeter, I direct your attention to what has been marked for identification as United Stated Exhibit WRIRC-231 and ask you to identify that, please.

A Yes. This is an exhibit depicting the North Crowheart Study Unit showing depth to barrier or showing areas with similar depth to barrier and hydraulic conductivity.

Q I refer you for the moment to U. S. Exhibit WRIRC-35, titled the Study Area Land Base Map, and ask if you can locate this North Crowheart Study Unit on that map?

A Okay. Let's locate it in this area marked with the Wind River.

Q That area outlined in red?

A That's correct.

Q Thank you. Was the information in Exhibit C-231 prepared by you or under your supervision?

A Yes, it was.

Q Do you know if any of the information displayed on this map, on this exhibit is already in evidence?

A Yes, it is. These areas with crosshatched marked lines are those areas as testified to being arable by Mr. Kersich during his testimony.

MR. MEMBRINO: For the Court's information that data is in evidence through Exhibit C-44 and C-45.

Q (By Mr. Membrino) I notice on this exhibit that there are areas shaded in gray surrounded by red lines. Are those your additions to the map?

A Yes, they are. The outline of the study areas that were used during the analysis within this project.

Q Now, I direct your attention to the right hand corner of the Exhibit 231 and note a legend there. There is a shaded area surrounded by a red line that's designated boundary for area of analysis. Could you tell us what an area of analysis is?

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A Okay. An area of analysis, say for instance like this area here, was identified as NC-12, was an area that had similiar hydraulic conductivity and depth to barrier characteristices throughout the area.

Q It is you who selected those areas of analysis?

A Yes, I did.

Q How did you go about selecting--selecting each one?

A This was a rather detailed approach. What I did after all the drilling was in-house, I utilized that, USBR information and other appropriate information and located holes that were drilled throughout the study area. Once, having that information, I continued from there and determined weighted hydraulic conductivity for each profile.

I wonder at this time if it wouldn't be appropriate to make a sketch in the manner in which the hydraulic conductivity determination was made?

THE SPECIAL MASTER: It's up to Mr. Membrino.

Q (By Mr. Membrino) Sure. Mr. Toedter, why don't

you take one of those blank mounting boards and we'll identify it as U.S. Exhibit WRIR C-242.

Using that board, it may help for you to just sketch for the purposes of illustrating the testimony, how you--how you go about establishing hydraulic conductivity and depth to barrier.

MR. WHITE: Your Honor--

THE SPECIAL MASTER: Well, which, let me as which? I thought it wa hydraulic conductivity.

MR. MEMBRINO: First hydraulic conductivity.

MR. WHITE: Your Honor, I would object to the question. I object to the question because it asks the witness to prepare an exhibit during direct examination, which is a circumvention of the ten-day rule, if during direct examination they wish to introduce evidence that should be the subject of the ten-day rule.

THE SPECIAL: I will overrule the objection, on the basis that it really isn't in the province of the ten-day rule type of a piece of evidence. It is an illustrative accompanyment of oral testimony given to sketch or diagram or buttress that which is already spoken, Mr. White. This nothing more than a sketch of what his is testifying to

and I'm not even sure it will be offered. But go ahead.

MR. WHITE: Thank you, Your Honor.

THE WITNESS: Okay. What I'll attempt to do here first is show the rationale for the importance and the meaning of depth to barrier and hydraulic conductivity. Then secondly I will how it was utilized in this exhibit C-231.

THE SPECIAL MASTER: Will it be easier for you to work if that is lifted up about one yard higher than where it is? We have some hooks you're welcome to make use of.

Right, we have some hooks to hook it up.

(Brief pause.

THE SPECIAL MASTER: There you are. Okay, Mr. Membrino.

THE WITNESS: Okay. I'll attempt to show a drainage system here, just a typical cross-section of what works in operation. This here is your ground surface.

Q (By Mr. Membrino) That's designated by the green?

A Designated by green.

THE SPECIAL MASTER: You got two lines.

Are they both ground surface?

THE WITNESS: Okay. Now--

THE SPECIAL MASTER: All right, go ahead.

THE WITNESS: The upper line is the ground surface, the lower green line will designate as the barrier, and we'll get into how we define barrier a little bit later. And I'll call that BAR.

Now, the pipe drains are shown as two circles in blue. I'll show the water table level between drains as a curvalinear line in red between two pipes. Now, getting into how it relates to my analysis, I'll use a blue line and this will show a cross-section of the transmitting median. In other words--

THE SPECIAL MASTER: Of what?

THE WITNESS: Transmitting median, which is a cross-sectional area of the soils that the water moves through in order to get to drains. It moves laterally in both directions from the middle.

THE SPECIAL MASTER: What governs the perforations on the drain pipes?

THE WITNESS: Okay. That is usually or has been a set standard in the drainage business and

usually they figure about a square inch per opening per linear foot of drain is adequate to drain almost any condition. Of course, if you have a heavier soil then you won't need that opening. But that isn't a high cost item so it doesn't, you know, really become significant. Everything is designed basically the same way.

Okay. Then the second major item of importance to me is the barrier depth. And that is described by a material that has one tenth of the permeability of the weighted average of the material above it.

For instance, if the weighted average of the materials above the barrier is ten and the material in the barrier has a hydraulic conductivity of one, it would be one tenth less, meeting the definition for barrier.

Okay. Secondly, the information that I look at in this analysis can be shown by a profile, something like this. What I will do here is I will assign in two-foot increments througout the profile.

Q (By Mr. Membrino) You're referring now to a blue rectangle on the left-side of that exhibit, 242?

A Yes, I am. And this is an example of the profile

commonly used in our business.

Okay. In the field when I'm logging behind a drill I will texture the appropriate soils as they're brought up out of the ground, use it, usually laying it out five feet at a time, one through five, then structuring them, sort of like a book, going from left to right. Under the first foot I put the six foot, go up to ten, then the 16th foot will be put--excuse me, the 11th foot will be put under the sixth foot and go so on and so forth, up through the fifth and so on.

Okay. After the soils are laid out I go through and I texture each and every foot. I identify the textures that are present within that profile. Then I write a log of that profile. For instance, the first six feet might be sandy loam and I would indicate it like that on my profile.

* * * * * *

Q. (By Mr. Membrino) You have indicated SL there?

A. Yes. And indicated SL on my drawing.

Okay. The next 8 feet typically might be fine sandy loam, and maybe the next --

Q. That fine sandy loam is designated FSL?

A. Yes, it is. And the next 6 feet might be loamy sand, designated LS. (Witness marked on document).

Q. Now, on the right side of that rectangle, you have what appear to be blue slash marks going on. What do they represent?

A. Okay. These blue slash marks were set up here in order to identify soil depths.

The soil indications on the soil depths were set up on the basis of 2-foot increments. I have a little designation in the middle of the FSL block that indicates 10. I have another designation at the bottom of the hole that indicates 20.

Q. And that's feet, 10 feet and 20 feet?

A. That's correct.

Q. Does that column then represent a cross section of the graph?

A. Yes. That represents a cross section of the material in that area.

Q. Are we looking from the same perspective at that

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column as we are with the diagram to the right describing the drains?

A. Yes. This column could be moved right over into this area describing the drain (indicating).

One thing I might point out is that in all likelihood we might hit hard sandstone or shale in the bottom of the hole, and that would be our barrier as indicated by this map (indicating). Usually these materials display real low permeability.

Q. To make something clear, material does not have to be impervious in order for it to be barrier, however?

A. Yes, that is correct. As long as it's one-tenth less than weighted average of the materials above it.

Q. Now, what do you do --

THE SPECIAL MASTER: It's one-tenth less than the weighted or not more than 10 percent of the weighted average?

THE WITNESS: Okay, 10 percent of --

THE SPECIAL MASTER: There's a world of difference. Weighted difference is .9 and your barrier is .8, and if one-tenth more or less, but it sure is not a barrier.

MR. MEMBRINO: I believe it's one-tenth of the weighted hydraulic conductivity, the material above

it.

THE SPECIAL MASTER: Not more than that.

THE WITNESS: Yes, it's one-tenth of the weighted. In other words, if you were to take the materials above it and divide that by 10, that result by 10 --

THE SPECIAL MASTER: Anything higher than that from the barrier would not be barrier?

THE WITNESS: That's correct.

THE SPECIAL MASTER: Tell me -- let me ask a question, Mr. Membrino.

Mr. Toedter, why in your business is it that symbols are used so much differently for exactly the same substantive description? In Mr. Kersich's map symbol code he uses a V for loamy sand and uses a small B for drainage barrier, the same in Mr. Waples' report.

You use different terms, however, in your maps; is that correct?

THE WITNESS: Well, actually I use the same symbols that these guys do.

I think what we have to do, for clarity, is just get out what we are trying to do. When these gentlemen log profiles, they use the same symbols that I do. But when they go out and identify a

piece of land such as slope here and give it a land classification, in their symbols, then they use the Vs and the Ds and the other things which you are referring to, so --

THE SPECIAL MASTER: I'm not sure I understand, but thank you for the answer.

THE WITNESS: It's a symbol used in land classification whereas these symbols are used pertinent to logging for profile.

THE SPECIAL MASTER: Those were work paper symbols you are using on your sketch as distinguished from final product symbols in mapping?

THE WITNESS: No --

THE SPECIAL MASTER: That's not quite true?

THE WITNESS: That's not --

THE SPECIAL MASTER: Disregard my observation and my question.

Let's go right ahead.

Q (By Mr. Membrino) When you have established what the profile is, what do you do next in your schematic there to determine what the hydraulic conductivity is?

A. I develop a weighted average of the profile from 4-foot depths, which would be the depth from my red line in my sketch down to the barrier.

Q. Is that what you have described as the root zone or root zone earlier in your testimony?

A. Yes, the 4-foot zone is the root zone.

Q. Now, you say you disregard that. Why do you disregard that in establishing the profile?

A. The reason is because it is not part of the transmitting medium. In other words, no water is transmitted through that medium.

Q. If you have water in the root zone, what happens?

A. Then you start to run into all sorts of problems. Productivity becomes limited. Salinity may occur. Just some common problems that are around irrigation projects where the water table is high.

Q. So the two circles you have indicating drains on your sketch are intended to contribute to keeping that root zone free of water? Is that what it's all about?

A. Yes, that's their sole purpose.

Q. Now, on your profile -- just one other question -- on your profile then, are the top 4 feet of the soils represented in your profile or not?

A. Yes. I show the entire profile. However, in my analysis I will elect to ignore the top 4 feet and continue from there on.

Okay. What I've attempted to do here is just

develop a weighted average. I'll take the depth of the particular zone of this sandy loam that's below 4 feet.

In other words, the 4 to the 6-foot depth, that difference is 2 feet. Then I'll take the fine sandy loam or the FSL portion of the profile from 14 feet back up to 6 feet and determine that difference, which is 8 feet.

Then next I will look at the loamy sand portion of the profile, which extends from 20 feet up to 14 feet, and that difference is 6 feet.

Now, based on the HKM hydraulic conductivity results and some of my professional experience, too, I assigned hydraulic conductivity for each one of these textures.

The hydraulic conductivity for sandy loam was 5.0 feet. That I assigned for fine sandy loam -- I'll just use an example -- is 2.6, and that assigned --

THE SPECIAL MASTER: What are those figures in the parentheses, inches per hour?

THE WITNESS: Yes, they are rated in inches per hour.

A. And the loamy sand is 7 1/2, and again, that's in inches per hour.

Q. (By Mr. Membrino) Now, you state you established those values for those kinds of soils -- you said by your experience -- does that mean you went out and actually tested soils on the Wind River Indian Reservation?

A. Okay. Yes. That's based on mainly testing the Wind River Indian Reservation. In some cases, because of the significant number of different textures that I have to analyze in this analysis, some judgment was required in other areas.

And what I did in most cases was just look at the values that I had already obtained in the field and projected what a reasonable value for material would be that was reasonably close in texture to that.

Q. Are there textbook sources or other kinds of sources you would use to check your determinations, your own empirical determinations against?

A. Yes.

Q. Did you do that?

A. Yes.

Q. How did they match up?

A. Reasonably close. As close as you will in this business. This is kind of an art.

Q. Okay, so you now have the hydraulic conductivity for each type of soil you found there. Now, what do you do with that?

A. Okay. What I attempted to do is find the weighted average of these numbers.

For example, here I have a profile that's 16 feet deep, so if I find the product here, which is 10, and then add this product to it (indicating) --

Q. Now, is that perhaps the hydraulic conductivity for each is an inch per hour per foot of soil medium?

A. Yes. These are all in column units, so as a consequence, you can find the product and then divide by the depth and end up with the same units you have.

THE WITNESS: Has anybody got a calculator?

MR. WHITE: Yes.

THE SPECIAL MASTER: What did you get?

THE WITNESS: Okay. I get approximately 6 inches per hour.

THE SPECIAL MASTER: Six inches per hour?

THE WITNESS: Yes. That would be the weighted hydraulic conductivity for all these textures, so I'll put that up here at the top of the board.

So kind of in summation, what that means is this transmitting media through this area for this

particular sample would have a hydraulic conductivity of 6 inches per hour, and the depth to barrier would be 20 feet, and the depth to barrier is given from the ground surface down to the actual barrier depth.

Q. (By Mr. Membrino) In this case 6 inches per hour is approximately -- is essentially 60 times your minimum standards for hydraulic conductivity set out in the table we were discussing earlier?

A. Yes, that's correct. However, this rate of hydraulic conductivity is not uncommon for soils found within the Wind River Indian Reservation.

* * * * *

Q (By Mr. Membrino) Do you have a calculation of what minimum depth to barrier you could have in a situation where you have conductivity of six inches per hour?

A I guess, Joe -- Mr. Membrino, I don't understand what you're alluding to.

Q Well, in terms of your minimum drain spacing standards, what kind of drain spacing could you have, what kind of minimum depth to barrier could you have where there was hydraulic conductivity of six inches per hour that would permit you to have drains spaced as close as 200 feet?

A Okay. This gets out of my area of expertise within this litigation. The maximum that I looked at was one inch per hour for hydraulic conductivity, and the reason for that was because of the fact that one inch per hour was the highest rate of hydraulic conductivity required to meet the 200-foot drain spacing.

Q Thank you. Does that complete your description of the method for computing the hydraulic conductivity?

A Yes, it does.

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Q Would you describe now how you, having established the hydraulic conductivity, establish your depth to barrier?

A I think I've gone into a little bit of this analysis before so I won't spend a great deal of time in this area. Again, we derived as just presented, a determination of the hydraulic conductivity of the materials within the profile and then finding material that has a hydraulic conductivity that's at least ten times lower than that present above and we call that barrier.

Now, in an area analysis similar to what's shown on this exhibit here there are a number of holes, and you will experience some variation from hole to hole. As a consequence, I evaluated all my data within an area, generally I didn't use the lowest value. I used something that was reasonably close to the lower values present.

Q I show you -- I show you what's been marked for identification as United States Exhibits WRIR C-241-A and 241-B. Would you identify them, please.

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A Yes. They are my computations. 241-A is the Wind River Drainage computations for the Wind River Drainage analysis, depth to barrier and hydraulic conductivity for the future lands.

And 241-B is again the drainage analysis, depth to barrier, an average weighted hydraulic conductivity for the historic lands.

A Are these copies of the same documents that were furnished to Mr. White in your deposition last week?

A Yes, they were.

Q Thank you. Turning your attention now to Exhibit C-231, North Crowheart Study Unit, would you locate -- Could you describe how you designate this area in the right-hand corner of the map? It's a gray shaded area circumscribed in red.

A Okay. The designation we have used is shown down here in the legend. First off we have a symbol, it's an alpha-numerical symbol. The alpha-numerical part stands for the particular study area, which is the North Crowheart Study Unit.

Q That is the NC designation?

A The NC designation. And then the number was an identification of the area, and each of the areas were designated in consecutive order throughout the study unit.

Q Now, the area I have indicated on the map has a alpha-numerical symbol and it's connected to the gray and circled area by a dark line. Would you tell the Court what that symbol -- what that symbol is, what is the designation of that?

A Okay. This symbol here is just a symbol that indicates that these results pertain to the study area. There is no pertinent point indicated within the study area at all.

Q Now, NC-12 then is the area we're speaking aobut?

A Right. And that data relates to the entire study area.

Q Beneath the designation NC-12 there are two numbers. Would you tell the Court what they stand for?

A Yes. The upper number indicates the average weighted hydraulic conductivity in inches per hour for the area, and the lower number indicates the depth to barrier of the study area.

Q And what are they in that situation?

A 2.7 inches per hour hydraulic conductivity, and 15 foot depth to barrier.

Q How do they compare with the standards, the land classification standards regarding drainage?

A Okay. We set minimums in our standards of one-tenth of an inch an hour and as you can see the 2.7 is significantly greater than that, and the depth to barrier was 15 feet and of course, it's significantly greater than the six feet.

Q Thank you.

MR. MEMBRINO: For the convenience of the Court we have an unmounted copy of that map on your table, if you wish to refer to it.

THE SPECIAL MASTER: Thank you, I appreciate that.

Q (By Mr. Membrino) I notice that the shaded area, the area shaded in gray in NC-12 includes more than the lands indicated by the legend as hash-mark lands, as being the arable lands. What went into your decision to include the area you did in NC-12?

A Okay. There was some pertinent borings in some of the areas immediately outside of the arable lands, and I chose in my analysis to make

utilization of these borings. So as a consequence, my analysis area boundaries were not held in tight to the arable lands.

Q What value does a boring have that's located outside the arable lands to a determination of hydraulic conductivity or depth to barrier within the arable lands?

A Okay. This was reviewed on the basis of the geology and the land forms of the area, topography and the things such as this nature. If I felt that it wasn't pertinent I didn't include it as a portion of my data gathering process.

Q Can you tell the Court what land forms you examined in concluding as you did about NC-12?

MR. WHITE: Objection to this question. I think we've gotten two definitions of land forms, one from Mr. Kersich and one from Mr. Waples, and I think it would be appropriate before this question is answered to have a definition of what this witness means by land form, and I would object because the question's ambiguous for that reason.

THE SPECIAL MASTER: The objection is overruled.

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You may answer.

THE WITNESS: Okay. The materials generally present in this area are alluvial in nature and also in some cases may be a terraced.format. I think probably what we should do is take U.S. Exhibit WRIR C-33 and look at that.

This area is comprised of terrace deposits and some alluvial materials adjacent to it.

THE SPECIAL MASTER: What professional conclusion motivated you to make your working area as large as you did around NC-12?

THE WITNESS: Okay. If I understand your question correctly, how come I chose this size of an area?

THE SPECIAL MASTER: Yes.

THE WITNESS: Assigned this depth to barrier and hydraulic conductivity for that?

THE SPECIAL MASTER: I can appreciate your depth to barrier and hydraulic conductivity, but you were talking now about land forms which was covering your designation of the boundaries for areas of analysis. How come such a large area of analysis around an area less than half that much which is arable land of NC-12?

THE WITNESS: Okay. I guess one point that I didn't make entirely clear here is if we slip to North Crowheart area 12 of the United States' Exhibit WRIR C-241-A, which is the larger area --

THE SPECIAL MASTER: Okay, North Crowheart area, 21.

THE WITNESS: Twelve.

THE SPECIAL MASTER: I beg your pardon. Okay. Got it.

THE WITNESS: Okay. What I did is I developed some worksheets with the arable lands, in other words, the cross-hatched lands that are shown here. Then I located all the holes that I identified by symbols in table 1 of this report. They include HKM deep holes that were drilled in 1979, HKM land class holes, USBR drainage holes, USBR deep holes, which are also performed during the same drainage investigations; USBR test pits. When we obtained the data from the State of Wyoming, evaluated State of Wyoming's test pits, and they are shown by two different symbols on our maps, and then HKM deep holes in 1980, 1981.

* * * * *

THE SPECIAL MASTER: And they are shown on 231?

THE WITNESS: No, they aren't. I've got some work maps --

THE SPECIAL MASTER: No, no, I don't need to see them. God, I have got enough maps, believe me.

Q. (By Mr. Membrino) To make this a little more simple, is the information recorded as to holes in Exhibit C-241-A recorded on your work maps?

A. Yes, it is. It's taken right off the work maps.

THE SPECIAL MASTER: And are many of those holes in your study analysis area rather than actual arable land?

THE WITNESS: Most of them were in the analysis area.

THE SPECIAL MASTER: I see what you mean.

THE WITNESS: I don't know if you can see this worksheet, but the holes were identified by the red and green symbols (indicating).

THE SPECIAL MASTER: Yes, you have answered my question, if you will just identify what you are holding in your hand.

THE WITNESS: Okay. This was a work map of the North Crowheart Study Unit showing the same information that's shown on WRIR C-231.

However, Exhibit WRIR C-231 does not show the location of the borings that I used --

THE SPECIAL MASTER: Which are on the map that you are holding in your hand?

THE WITNESS: Yes.

MR. MEMBRINO: For ease of the record, I will mark this WRIR C-243, and it will refer to Mr. Toedter's work maps. I will put a sticker on that.

THE SPECIAL MASTER: All right.

Q. (By Mr. Membrino) Mr. Toedter, was a copy of that work map made available to the State of Wyoming during the course of your deposition last week?

A. Yes, it was.

Q. Now, referring to Exhibit 241-A, North Crowheart Area, there are a number of holes listed, not all of which were holes dug by HKM. Is that true?

A. Yes, that is correct.

Q. On Page 13 of 241-A, there is a conclusion or a statement made that the average weighted hydraulic conductivity is 2.7 inches per hour and the depth to barrier is 15 feet.

Now, on which information that's recorded here in Exhibit 241-A did you rely to establish the hydraulic conductivity of 2.7 inches per hour?

A. Okay. That was based on Hole 5-B, which is at the bottom of Page --

MR. WHITE: I would object to this line of questioning because the question calls for an answer based on a document not yet in evidence. He's reading from a document not yet in evidence.

Until it's offered in evidence, I don't think it's permissible until I have a chance to voir dire, and I will object to this exhibit for violation of the 10-day rule.

THE SPECIAL MASTER: I was of the opinion that 241-A -- just a second, Mr. White. Let me see what my notes show on that.

I have got that confused with 228-A, -B, -C.

MR. MEMBRINO: Your Honor, we do propose to offer this in evidence at the conclusion of Mr. Toedter's testimony.

I want to point out that these documents were made available to the State, admittedly not 10 days prior to this hearing, but during the course of Mr. Toedter's deposition as well as his work map.

THE SPECIAL MASTER: I will overrule the objection, not so much on the 10-day matter,but -- as they are not being in evidence, but because of the

fact that if he knows from his own experience what he based his conclusions on, on Page 13 regarding depths and can so state, he can state.

Now, if he refers in doing that to Hole No. 5-B, which was drilled so and so and so on, that is admissible. I will hold it that way.

You may prove me wrong in a few years, but I'm going to hold that.

I have some questions on this point, too, that are not exactly an objection too, but I want to know, are you saying that you based your conclusion of depth to barrier at 15 feet and average weighted hydraulic conductivity of 2.7 inches per hour on the results of 1 out of 10 holes drilled?

THE WITNESS: Okay. No, I'm not saying --

THE SPECIAL MASTER: That's what I thought you were trying to say.

THE WITNESS: No.

THE SPECIAL MASTER: Then what are you saying you based it on?

THE WITNESS: Okay. Let's take a look at hydraulic conductivity first.

Okay, and all these holes designated by Cs are Bureau of Reclamation holes which we have alluded

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to a little bit previously.

Those holes designated with an E are also Bureau of Reclamation test pits.

Okay. When one pages down through the weighted hydraulic conductivities, you will note that they range between 6 inches an hour and 15 inches an hour.

Now, note Hole 5-B, which is an HKM land class hole, and also Hole 79-A on the next page, which was an HKM deep hole drilled with power auger.

You will note that these weighted hydraulic conductivities are considerably lower than the conclusions you would arrive at using Bureau of Reclamation information.

Consequently, I felt that the HKM results were more reliable than USBR, so I chose to take the average of these two holes, arriving at a conclusion of 2.7 inches an hour for this area.

I found this to be common throughout my analysis. There were just a few instances in which the weighted hydraulic conductivity for HKM holes exceeded the Bureau of Reclamation.

In those cases I subsequently reduced the results that I arrived at in order to more closely

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be aligned with their results.

Q (By Mr. Membrino) So was it your testimony that even though the HKM --

THE SPECIAL MASTER: Please don't repeat his testimony because he did it beautifully, and I don't think he can be improved with a question that begins, "So it is your testimony that." We don't need it.

Okay, Mr. Membrino.

MR. MEMBRINO: Yes.

Q (By Mr. Membrino) How did you establish the depth to barrier in area in the NC-12?

A Okay. Again, that was a basis of review in this area. I looked at each one of the holes.

There is some variation there between 7 1/2 and 15 feet. This was a very hard area in which to structure a depth to barrier for.

I ended up assigning a value of 15 feet because of the number of holes which a barrier could not be detected in the area.

Now, there were some areas with some holes that indicated that the barrier was shallower than 15 feet. Generally, I believe that I was more conservative in my approach than what I was in this particular example.

In other words, I would take some of the lower

values, which would range in the 7 1/2 to 10-foot area, maybe increase them by a couple feet, which gives me kind of a weighted average for the area, and assigned that as my hydraulic conductivity.

THE SPECIAL MASTER: If that depth to barrier got down to 7 and 6 feet to where it tested your criteria, what would you then do?

Did you have such examples on this Reservation?

THE WITNESS: Yes, I did.

THE SPECIAL MASTER: What did you then do?

THE WITNESS: Okay. I evaluated each, you know, one on a case-by-case basis.

Now, if there was one hole within a block of land such as this, generally that sort of situation is kind of an outlyer --

THE SPECIAL MASTER: Kind of an --

THE WITNESS: An outlyer from the standpoint of statistics.

In other words, it won't group within your data, so I would more or less ignore that result.

However, if there were several holes in an area which definitely indicated that the barrier was shallower than 6 feet, the parcel was classified as nonirrigable and is not shown on these exhibits.

END

Q (By Mr. Membrino) Is there anything --

THE SPECIAL MASTER: Off the record, please.

(Off-the-record discussion.

THE SPECIAL MASTER: Back on the record, please.

Q (By Mr. Membrino) Is there any area of land classified as arable by HKM whose hydraulic conductivity or depth to barrier is less than the minimum set out in the standards we discussed earlier?

A There is not to my knowledge.

Q I direct your attention now to the area preceeding NC-12 in your -- in Exhibit 241-A, that is in C-11, and ask you to locate it on the map, if you would. That is Exhibit 231.

A That's this area right here.

Q Just south of NC-12?

A Yes.

Q Would your report to the Court what your conclusions were there on depth to barrier and hydraulic conductivity?

A Okay. This area had limited data upon which to work with. It was obvious from the data that the hydraulic conductivity was somewhat higher

and the depth to barrier in the area was shallower based on the Bureau hole. So as a consequence I identified it as an independent area and set the depth to barrier at eight feet on the basis of the results shown on Page 11 as assigned an average weighted hydraulic conductivity to it of six inches an hour.

Q In the area of analysis on NC -- on Exhibit C-231 in the area of analysis in NC-11 are there any holes that were dug by HKM?

A No, there were not.

Q What holes are there?

A There were two holes dug by the Bureau of Reclamation.

Q Now, how did you rely on those two holes,, if at all, for either value, hydraulic conductivity or depth to barrier?

A Again, in this business you have to take into consideration your land form, you've got to consider the textures that are present. So if you'll evaluate the textures that are present first of all in area 11 on Page 11 and then those present on area 12, Page 12, it's obvious that the materials are gravelly and sandy in

major.

MR. WHITE: Your Honor, could I have a continuing objection to testifying from documents not in evidence, please?

THE SPECIAL MASTER: Yes, you may, Mr. White. And I was going to say though that you didn't really answer his question. Did you refer to Hole 10-C and 18-C in your work and conclusions on area 11, yes or no?

THE WITNESS: Yes, I did.

THE SPECIAL MASTER: You did?

THE WITNESS: Yes, and considered some other elements.

Q (By Mr. Membrino) Did you adopt the hydraulic conductivities described for each of those holes?

A I used the lower value because that seemed like the most reasonable assignment.

Q Now, the information that's contained in 241-C -- 241-A rather, this compilation of your work is derived from your work map that we have designated as U.S. Exhibit WRIR 243, C-243?

A Yes, that is correct.

Q And what is the source of the information on that work map?

A The source of the information comes from items that are identified within the legend of the United States Exhibit WRIR C-241-A.

Q Does that include the --

A That's shown on table 1.

Q Does that include the logs that you testified earlier were admitted into evidence through Mr. Kersich and are designated as United States Exhibits WRIR C-147-A, B and C?

A Yes, it does.

Q Were there any aerial photographs used to derive the information you have -- you have been discussing?

A Yes. That was a component part of the work.

Q Are those photogarphs in evidence?

A Yes.

THE SPECIAL MASTER: Does this witness -- is he a competent man to know whether they are or not?

Q (By Mr. Membrino) Do you know whether any of those photographs are in evidence, Mr. Toedter?

THE SPECIAL MASTER: Well, I submit he's not a competent witness to know whether they are or not, Mr. Membrino. If they are, just get it

out, you know, introduce them.

Q (By Mr. Membrino) Mr. Toedter, I direct your attention to United States Exhibits WRIR C-148, numbers 1 to 30.

MR. MEMBRINO: Are those exhibits in the courtroom?

(Off-the-record discussion.

MR. WHITE: Al took them back.

MR. ECHOHAWK: No.

MR. WHITE: Your Honor, I think that Mr. Kersich has those photographs.

MR. ECHOHAWK: He does, Your Honor, because he requested me to check those out.

THE SPECIAL MASTER: All right.

MR. MEMBRINO: I would like to know simply for the moment whether or not those photographs are in evidence and they're just not in the courtroom?

THE SPECIAL MASTER: That's right.

MR. WHITE: I think they're in evidence.

THE SPECIAL MASTER: I'm informed those exhibits are in 10-H, 11-H, which is the depository for all our material now that they couldn't fit into my office or my assistant's

offices.

Q (By Mr. Membrino) Are you familiar with those photographs?

A Are those the 1979 land classification photos?

THE SPECIAL MASTER: Obviously in determining your hydraulic conductivity evidence and depth to barrier, I would imagine the last thing you used was an aerial photograph. If you used an aerial photograph you should show me how you used it.

THE WITNESS: I just used it to depict the area of the work.

THE SPECIAL MASTER: To where you do your work?

THE WITNESS: Right.

THE SPECIAL MASTER: Any other useful contributions in arriving at these figures though?

THE WITNESS: No.

MR. MEMBRINO: Your Honor, in response to Mr. White's objection, it is clear that all the data, raw data on which Mr. Toedter relied to make his conclusions is already in evidence through other witnesses. This information here

is simply a compilation of that and is prepared for the ease of the Court and the witness and the parties in understanding this portion of the case.

MR. WHITE: Your Honor, I'd like to respond by saying we're getting the cart before the horse, and if he's going to offer them, let's offer them and I'll voir dire on them. And I would point out to the Court that they've not been offered, and if he's not going to offer them I'd appreciate it if he'd abstain from making those kind of remarks until I've had a chance to voir dire the exhibits.

THE SPECIAL MASTER: On that point of interesting difference regarding 241-A let's take a short five or ten minute recess. We haven't had one for better than an hour.

(Whereupon a recess was taken.

* * * * *

THE SPECIAL MASTER: Okay. Let us resume.

MR. ECHOHAWK: Your Honor, before we resume, we need to bring up the entry to the Reservation again.

About an hour or two ago I was informed by Mr. Rifkin that Wyoming wouldn't be going to the Reservation until Monday.

THE SPECIAL MASTER: I thought they were going to go and work all weekend because of the hassle this morning.

MR. ECHOHAWK: And he later came back and told me they weren't going to go until Monday, so I went and made the phone call and told my people they wouldn't go until Monday and canceled all our plans.

Now, they have just told me they do want to go this weekend.

THE SPECIAL MASTER: Then you will not work over the weekend. This is enough to drive a saint to profanity.

What's going on, Mr. Rifkin?

MR. MERRILL: Your Honor, I must apologize. It was my mistake and not Mr. Rifkin.

I failed to inform Mr. Rifkin of your order, assuming that Mr. Krob was also going to take --

THE SPECIAL MASTER: It was the most favorable

ruling I have ever made for the State. I as much as imposed on the Indians to the accommodation of the State on the two days of work with the people up there and said it would have to be that way because it was the way I wanted it to be.

Now, because they were not notified, it's the other way.

I don't know what to do about this now.

MR. SACHSE: Could I say something, Your Honor? I think it makes one thing very clear, that the State doesn't need to work up there over the weekend or they wouldn't have said they would start Monday.

THE SPECIAL MASTER: I think that's a proven factor. Let's just forget about any work up there over the weekend and you tell your state people it's not our fault they couldn't work the two days up there. I don't know how else to explain anything of this kind. I don't know what else I can do.

MR. ECHOHAWK: I will make arrangements to have the escorts ready at eight o'clock Monday morning.

THE SPECIAL MASTER: I don't know what else we can do.

MR. WHITE: Does that apply to this weekend or next weekend?

THE SPECIAL MASTER: No, we are only talking about this weekend, the coming Saturday and Sunday.

Off the record, please.

(Off-the-record discussion.

THE SPECIAL MASTER: Let's go back on the record, Vi, and I'm sorry about that foul-up. I thought we had worked that out pretty well and I thought it was going to work out nicely to have those two days with the extended 15 days.

Go ahead, Mr. Membrino.

MR. ECHOHAWK: At this time, Your Honor, may I be excused from the courtroom to take the witness back to the airport?

THE SPECIAL MASTER: Yes.

MR. ECHOHAWK: Mr. Waples.

THE SPECIAL MASTER: Mr. Clear and Mr. Sachse are still here. Go ahead, Mr. Membrino.

Q (By Mr. Membrino) Mr. Toedter, I believe during the break you discovered a mistake in calculation on Exhibit C-242.

Would you like to clear that up at this point?

A. Yes, I would. I made a simple arithmetic error on this exhibit here. Rather than 6 inches per hour, which I will strike, I want to place 4.7 inches per

hour as the weight of hydraulic conductivity.

MR. MEMBRINO: The record should note, Your Honor, that Mr. Toedter was handicapped by the use of a calculator furnished by the State.

THE SPECIAL MASTER: Unfamiliar. Furthermore, it was Mr. White's.

MR. WHITE: The record should also note that I told the U.S. Attorneys about the error, Your Honor.

THE SPECIAL MASTER: Very good.

Q. (By Mr. Membrino) Mr. Toedter, returning to the testimony that we left just prior to the break, would you explain to the Court how you were able to employ data such as drill holes in an area that is not included in arable lands and yet be able to conclude about hydraulic conductivity and depth to barrier from that information?

A. One thing that's a little bit different about this analysis than the land classification analysis is a consideration of the areas that are involved.

There's a number of more factors within the land classification analysis that have to be considered for a piece of ground to meet the standards.

Therefore, I could utilize tools such as geology.

You might note how this land form strings down through this area. There's a reason for the reason -- or for the shape of those areas down through there, and that's because it's a general land form and is related to the water movement at some point in time through the Muddy Creek area and consequent deposition.

Therefore, it enables me to project from a hole that I have drilled in the area out into the surrounding area adjacent to that.

Another point that is important is that wherever possible, rather than just utilizing one, I tried to look at several holes within an area upon which to draw my conclusions.

Q (By Mr. Membrino) Now, I notice along that Deer Creek drainage along which you have located NC-12, NC-11 and NC-10 on U.S. Exhibit WRIR C-231, you have, in fact, broken up that one land form into different areas of analysis.

Could you explain what facts and data you came across that led you to do that?

MR. WHITE: Your Honor, could I have a continuing objection with respect to Exhibit 231 and other exhibits where the witness testifies about the

exhibit or from the exhibit before the exhibit is admitted into evidence?

THE SPECIAL MASTER: Yes, you do.

THE WITNESS: May I continue?

THE SPECIAL MASTER: Yes. I might say though, Mr. White, that Exhibits like 231, it's a workpaper, and others that have its basis on the study area land form base map, all seem to go back to the same general outline of the study area we are familiar with. And so, all he's doing is looking at areas that could just as easily be identified in any one of four or five exhibits that are in evidence, but your objection is preserved.

A. Okay. As can be noted from these areas, the hydraulic conductivity varies from area to area. In some cases it isn't real significant and others it is.

Likewise, with the depth to barrier. The depth to barrier in this particular situation is a little bit more uniform actually than what the hydraulic conductivity was, and this is the main point that I want to bring out for breaking it in two areas is because of the fact that you see variability throughout this land form.

Q (By Mr. Membrino) Now, the areas of analysis you are

discussing are NC-9, NC-10, NC-11 and NC-12?

A. That's correct.

* * * * *

Q (By Mr. Membrino) And the depth to barrier in those respectively are?

A NC-12 has a depth to barrier, 15 feet; NC-11, 8 feet; NC-12: -- or NC-10, excuse me, 13 feet, and NC-9, 10 feet.

Q Now, is it the hydraulic -- Is it the depth to barrier or the hydraulic conductivity that caused you to establish the different areas of analysis?

THE SPECIAL MASTER: That causes us to establish what?

MR. MEMBRINO: The different areas of anlaysis, Your Honor, the areas shaded in gray, outlined in red and enumerated by the code NC-10, 11, and 12.

THE SPECIAL MASTER: I think he's pretty much answered he established the areas first and then determination of depth to barrier and the conductivity, and he identifies the work areas from the geology, from the land forms.

THE WITNESS: Can I clarify that point --

THE SPECIAL MASTER: Yes.

THE WITNESS: -- a little bit? This is kind of an intuitive process in terms of my

analysis. I look at these profiles first and get an indication of similar profiles and see how they group together according to these areas. Then in some cases I found out that I didn't get the grouping that I wanted, so I further separated an area and this will be present in some of my future exhibits.

One indication was where I used 4-A and 4-B for an area. It had similar depth to barrier, but different hydraulic conductivity, so consequently I assigned different area numbers.

MR. MEMBRINO: Your Honor, at this time I believe I am through with this exhibit and it may be an appropriate time to break until tomorrow. What I plan to do tomorrow is have these exhibits identified and have Mr. Toedter testify as to the information contained in them.

MR. WHITE: I'd like to keep going until five o'clock.

THE SPECIAL MASTER: I wanted to go on because I'm going to have to quit at two o'clock tomorrow, as I mentioned earlier to you, and if you want to move on for about another 30 minutes

on your case, it might be a good idea.

MR. MEMBRINO: That's fine, Your Honor.

Q (By Mr. Membrino) Mr. Toedter, I ask you to identify what's been marked for identification as United States Exhibit WRIR C-232.

A Yes. This is an exhibit showing the South Crowheart Study Unit.

Q Was this exhibit prepared by you under your supervision?

A Yes, it was.

Q Now, I direct your attention to the legend in the upper right-hand corner. The map contains, in the legend, a shaded area in gray, circled in red. Can you describe what that is?

A Okay. That is the area of analysis. Again, the area with similar hydraulic conductivity and depth to barrier.

Q Is that legend the same legend that's been employed in U.S. Exhibit WRIR C-231?

A Yes, it was.

THE SPECIAL MASTER: And is the South Crowheart south of the Main Stem of the Wind River?

THE WITNESS: Yes, it is.

MR. WHITE: Your Honor, for the purpose of perhaps shortening up the proceedings, the State would stipulate that if Mr. Toedter were asked the same general questions that he was asked about in Exhibit C-131 -- excuse me, 231, with respect to, I believe, 10 or 11 other maps that are very similar in format and layout, we would stipulate that he would answer the general questions in the same way with respect to those other maps that he did with respect to Exhibit C-231 and that might shorten things up a bit.

THE SPECIAL MASTER: I appreciate that offer and I think that does shorten things up a good deal. It's the kind of cooperation I've been praying for for the past few months. It doesn't jeopardize your case one bit in coming back and hitting him on what you wish on cross.

MR. SACHSE: The Tribes would also so stipulate.

THE SPECIAL MASTER: Yes, and I appreciate that from all parties.

Now, however, this is not 10, it's only -- is it for six specific areas or is it for ten?

MR. MEMBRINO: Your Honor, basically what we

have is the same kind of exhibit done for the future lands that were -- that were testified to by Mr. Kersich.

THE SPECIAL MASTER: All right. You have a separate one for Big Horn Flat Units?

THE WITNESS: Yes.

THE SPECIAL MASTER: Separate one for Riverton East?

THE WITNESS: Correct.

THE SPECIAL MASTER: Separate one for Owl Creek?

THE WITNESS: Correct.

THE SPECIAL MASTER: And one for Arapahoe Unit?

THE WITNESS: Correct.

THE SPECIAL MASTER: Those stipulations applied to, have you also done these for the -- for the historic lands?

MR. MEMBRINO: We have, Your Honor. Before we proceed to them, maybe we should identify which exhibit number goes with which study area.

THE SPECIAL MASTER: Let's do that beginning with South Crowheart Unit.

THE WITNESS: Okay. The number is U.S.

Exhibit WRIR C-232.

THE SPECIAL MASTER: C-232?

THE WITNESS: Correct.

THE SPECIAL MASTER: The one for the Big Horn Flats Unit is --

MR. MEMBRINO: That's out of order, Your Honor.. I believe the next one up is the Riverton East Study Unit.

THE SPECIAL MASTER: Okay.

THE WITNESS: Okay. And that number is U.S. Exhibit WRIR C-233.

MR. WHITE: I'm sorry, Your Honor, was it 233 for Riverton East or Big Horn Flats?

MR. MEMBRINO: Riverton East is 233.

MR. WHITE: Okay, thank you.

THE WITNESS: The Arapahoe Study Unit number is U.S. Exhibit WRIR C-234. The exhibit number for the Big Horn Flats Study Unit is U.S. Exhibit WRIR -C-235, and the exhibit number for the Owl Creek Study Unit is WRIR C-236.

THE SPECIAL MASTER: Would you give me South Crowheart again for the record?

THE WITNESS: I believe that's 232.

Yes, it's 232.

THE SPECIAL MASTER: And would you give me North Crowheart Unit again for the record?

THE WITNESS: Two thirty-one.

THE SPECIAL MASTER: All right. Does Mr. White's stipulation flow to additional exhibits regarding project or nonproject idle lands or historic lands in use?

MR. MEMBRINO: Does your stipulation extend to that?

MR. WHITE: It does, Your Honor, with respect to the general questions, with respect to methodology and preparation of the exhibits.

THE SPECIAL MASTER: All right, very fine.

MR. WHITE: So the record is clear, Mr. Toedter would answer the general questions the same way he did for these exhibits as he did for 231.

THE SPECIAL MASTER: Why don't we --

MR. MEMBRINO: I want to make clear for the record that the facts and data upon which he would base his analysis of these are, of course, the historic lands, facts and data, not the future lands, facts and data.

THE SPECIAL MASTER: That's all right. The facts and data are in the record, too, and tables are in the record, too, so let's include those.

Q (By Mr. Membrino) Would you identify Exhibit WRIR C-238?

A Yes. It's the Johnstown Study Unit.

THE SPECIAL MASTER: That confuses me a little bit. The Johnstown Study Unit is a study unit of what project?

THE WITNESS: Okay. That's the Johnstown Project.

MR. WHITE: That's an FIP, I believe, Your Honor. Is that right?

THE WITNESS: That's correct.

THE SPECIAL MASTER: It's on a different route from all other computations so far because it's an FIP within the historic lands?

THE WITNESS: Within the historic lands.

THE SPECIAL MASTER: I don't see where it's totaled..

Yes, I see 465 acres, isn't it, and yours is identified as C- what?

THE WITNESS: C-238.

THE SPECIAL MASTER: All right, thank you.

Q (By Mr. Membrino) We've taken one out of order here. Would you identify U.S. Exhibit WRIR C-237?

A Yes. This is for the Upper Wind Study Unit.

THE SPECIAL MASTER: Just a second, please.

Upper Wind has a total of how many acres on that, 5,900 about, or do you know?

MR. MEMBRINO: I don't have that figure handy.

THE SPECIAL MASTER: And this number is again, please?

THE WITNESS: U.S. Exhibit WRIR C-237.

Q (By Mr. Membrino) Would you identify U.S. Exhibit WRIR C-239?

A Yes. That includes the Ray and Coolidge Irrigation Projects and was callled the Ray and Coolidge Study Unit.

* * * * *

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Q (By Mr. Membrino) And U.S. Exhibit WRIR C-240?

A That includes the Subagency and Lefthand Units and was called Subagency and Lefthand Study Unit.

THE SPECIAL MASTER: All right. The last one was 230 --

THE WITNESS: 239.

THE SPECIAL MASTER: Okay. And it's Ray and Coolidge Study Unit? And Subagency is 240?

THE WITNESS: Correct.

THE SPECIAL MASTER: And Lefthand Unit is 240?

THE WITNESS: Yes.

THE SPECIAL MASTER: Thank you. Did you do the LeClaire Irrigation trust land?

THE WITNESS: No, I did not.

THE SPECIAL MASTER: Did you do the Midvale Irrigation trust lands? There were only 500 acres.

THE WITNESS: No, I did not.

Q (By Mr. Membrino) Mr. Toedter, you testified that your field investigation began in 1978 and went on for some time. Did you do any field work on drainage following the beginning of Mr. Kersich's testimony?

A Yes, I did.

Q Why did you do that?

A Well, as a result of Mr. Kersich's testimony, there were some areas in question. I reviewed the documentation that we had in-house, was not able to reach a subsequent conclusion, and so I spent some time in the field doing some additional work, drilling holes, and also reviewing cut sections along stream channels, roads, and the like in order to determine whether or not these lands had sufficient depth to meet our standards and also obtained some conclusion on the rate of hydraulic conductivity. That was based on the textures of the soils.

MR. WHITE: Your Honor, at this time then I would move to strike Mr. Kersich's testimony since if his own expert is unable to reach conclusions based on the facts and data upon which Mr. Kersich reached his conclusions, if those facts and data are inconclusive -- this man is an expert in the drainage area established by the court -- it seems to me that then the whole of Mr. Kersich's testimony, especially that relating to whatever parcels Mr. Toedter referred to as well as the larger whole is also without adequate foundation,

The rule used to be you couldn't impeach your own witness.

THE SPECIAL MASTER: Just let me rule on that. If this matter is of sufficient germaneness and gravemen that I should take it under advisement before I rule, I will do that. I'm not going to do that on the basis that it is now, Mr. White. Therefore, I would not concur in your motion.

MR. WHITE: I would urge you to take it under advisement.

THE SPECIAL MASTER: If you wish to file a couple pages on it with reference to some material, I would reconsider, but I would not --

MR. WHITE: Could we have the opportunity to submit briefs on the question?

THE SPECIAL MASTER: If you feel it is sufficient, if we get into it a little better and if you feel it is sufficient, then --

(Discussion off the record.

MR. MEMBRINO: I think we will clear some of this up.

THE SPECIAL MASTER: One at a time, gentlemen.

MR. WHITE: You are asking me to submit briefs if I thought it was important enough. We

will submit briefs because the evidence that you have just heard indicates that facts and data which Mr. Kersich relied on were not adequate for the drainage engineer to rely on.

MR. MEMBRINO: But --

THE SPECIAL MASTER: But you realize that these two experts were working and conferring on these points and where the opinions came to different conclusions, I think as reasonable experts and men, we can appreciate that that is how professional people work.

MR. WHITE: But that was after Mr. Kersich gave his opinion, Your Honor, and not before, and that is the basis for the objection. We will submit briefs.

THE SPECIAL MASTER: I would welcome a short brief on the point, and I will overrule it now with a right to take a look and overrule myself if in error.

MR. MEMBRINO: I think if we proceed with the testimony --

THE SPECIAL MASTER: If you want to submit one on behalf of the Tribes --

MR. SACHSE: I would like to take one minute

now if I could just to say that from my experience if Mr. White through his cross-examination of Mr. Kersich raised some questions that needed to be answered, then for another witness to go out, do the additional work that's required to answer those questions, that's the most ordinary and useful kind of procedure imaginable, and while I'm willing to, of course, answer any brief that Mr. White proposes here, I think it's essentially a frivolous motion to ask to strike Mr. Kersich's testimony because of additional work that's been done since Mr. White's cross-examination.

MR. WHITE: Your Honor, let me tell you why --

MR. MEMBRINO: Can I be heard?

MR. WHITE: Because when frivolous was mentioned, that has some remarkable overtones.

THE SPECIAL MASTER: I'm not sure I concur. If I thought your motion to strike was frivolous, I would overrule it and go on with my work. I have stopped and paused long enough to let you know I give it some importance.

MR. WHITE: The reason I think it's important

is that Mr. Kersich's opinion was based on the opinions of others. You may recall we had a big hassle about that.

THE SPECIAL MASTER: In part that's right.

MR. WHITE: And I think it's important when one of the expert's opinion does not agree with him without doing further field study.

MR. MEMBRINO: That is not the testimony.

THE SPECIAL MASTER: You can cite me to the record. It depends on what he said.

MR. WHITE: I will on brief.

MR. SPECIAL MASTER: Now, Mr. Membrino, go ahead.

MR. MEMBRINO: I would like to continue. I think we would have avoided a lot of this discussion had we been able to continue before Mr. White objected.

Q (By Mr. Membrino) Mr. Toedter, did you have any reason after doing more field work and reviewing the work that had been done -- did you have any occasion to change your conclusions?

A Yes, I did.

Q Could you explain, please?

A My conclusions actually ended up changing both

ways. In some cases I reduced the depth to barrier. In other cases I increased it, and the same thing was also true for hydraulic conductivity.

THE SPECIAL MASTER: In other words, you won a few and you lost a few?

nd-26-A THE WITNESS: That's right.

Q (By Mr. Membrino) Now, in any case, did your conclusions as to hydraulic conductivity depth to barrier require you to change your opinion as to whether any of the lands testified to by Mr. Kersich -- that is, the 84,000 acres or so and the lands testified to by Mr. Waples approximating 7300 acres, should have been reduced in any manner for failure to meet the standards you had set regarding conductivity and barrier?

MR. WHITE: Object to the question on the grounds that it does not clearly specify the difference between the problems raised on cross-examination of those witnesses and the problems raised by the offers of proof.

I have no objection to the question if it's specifically directed towards that testimony of the witnesses involved in cross-examination.

If, however, it involves offers of proof, that's completely outside -- well, it's simply improper because I was not allowed to inquire as to those areas, and the United States ought not to be able to put evidence on with respect to those areas. So I think the question is objectionable unless it's clearly directed toward the testimony

of the witnesses.

THE SPECIAL MASTER: By way of refreshing us, what subject matter were you denied the right to inquire about? I know of virtually none.

I know you were limited in the scope of inquiry.

MR. WHITE: You are right.

THE SPECIAL MASTER: You gave eight or nine examples where you had about 20, but you got something in on every point.

MR. WHITE: That's exactly the point. I can't remember -- let's say there were roughly 50 and you allowed me to inquire about 15 of so, and then I made my offer of proof with respect to the other 35.

My objection to Mr. Membrino's question is that it must be limited to the 15 that the inquiry was allowed for and but not include the 35 in my example where an offer of proof was made.

THE SPECIAL MASTER: In that case your objection is only one quesion premature. If he answers, yes, he did, then your objection is in order.

If he answers, no, then it's premature. So I will overrule it now and it can be answered yes or no.

MR. WHITE: Could I hear the question again,

Your Honor?

THE SPECIAL MASTER: Yes.

(The question was read back by
(the reporter as follows, to wit:
("Q: Now, in any case, did your
(conclusions as to hydraulic con-
(ductivity depth to barrier re-
(quire you to change your opinion
(as to whether any of the lands
(testified to by Mr. Kersich --
(that is, the 84,000 acres or so
(and the lands testified to by
(Mr. Waples approximating 7300
(acres, should have been reduced
(in any manner for failure to
(meet the standards you had set
(regarding conductivity and
(barrier?"

A. Okay. There was no change.

THE SPECIAL MASTER: There was no change?

THE WITNESS: No change.

THE SPECIAL MASTER: See, the question was premature and anticipated there would be some change.

Very good, Mr. White.

Okay, proceed, Mr. Membrino.

MR. MEMBRINO: Your Honor, at this time I would like to move into evidence the following exhibits --

THE SPECIAL MASTER: Would you like to do it after a good night's sleep and a good meal?

MR. MEMBRINO: You bet, Your Honor.

MR. WHITE: Let's go ahead and get them offered.

THE SPECIAL MASTER: I'm tired, Mr. White, and I think it's close enough for a good day's work. We have been at it since 9:00 and it's almost 5:00.

Let's adjourn until 9:15 in the morning and proceed in a new direction then, and I know we are going to have a short day tomorrow, and I'm grateful to you for your stipulations that have made our work-load easier, and let the record show that we worked until ten minutes until 5:00.

(Whereupon the proceedings
(recessed at 4:50 p.m. to re-
(convene at 9:15 a.m., Wednes-
(day, April 22, 1981.

* * * * *

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REPORTERS' CERTIFICATE

State of Wyoming)
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County of Laramie)

We, Merissa Racine and Viola J. Lundberg, Registered Professional Reporters and Notaries Public, hereby certify that we did at the time, date and place, as set forth, report the proceedings had before the Honorable Teno Roncalio, Special Master Presiding, in stenotype; that the foregoing pages, numbered 3615-3818, inclusive, constitute a true, correct and complete transcript of our stenographic notes as reduced to typewritten form under our direction.

We further certify that we are not agents, attorneys or counsel to any of the parties hereto, nor are we interested in the outcome thereof.

Dated this 21st day of April, 1981.

Merissa Louise
MERISSA RACINE
Registered Professional Reporter

Viola J. Lundberg
VIOLA J. LUNDBERG
Registered Professional Reporter

MERISSA RACINE - NOTARY PUBLIC
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