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Wyoming's Response to the US and Tribes, Volume V, Appendix A, Part 4

Attorney General, State of Wyoming

WYOMING'S RESPONSE TO THE UNITED STATES' AND TRIBES' PROPOSED FINDINGS OF FACT, CONCLUSIONS OF LAW, INTERLOCUTORY DECREE AND SUPPORTING BRIEFS

VOLUME V

Appendix A

(Part 4)

case # 4993

File # 323

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Margaret V Hampton CLERK

DEPUTY

IN THE DISTRICT COURT OF THE
FIFTH JUDICIAL DISTRICT
STATE OF WYOMING

IN RE: THE GENERAL ADJUDICATION OF ALL RIGHTS TO USE WATER IN THE BIG HORN RIVER SYSTEM AND ALL OTHER SOURCES, STATE OF WYOMING	)	CIVIL NO. 4993

VOLUME 5

APPENDIX A

(PART 4)

This Part 4 of Appendix A responds to United States' Proposed Findings of Fact 527 through 657. Each proposed Finding to which Wyoming responds is reproduced verbatim on a single page with Wyoming's response thereto on the page or pages immediately following.

N.B. Wyoming has not responded to every finding of fact proposed by the United States but the lack of a response to a finding should not be construed as an admission of the relevance or accuracy of such finding.

United States Proposed Finding of Fact:

XI. MINERAL DEVELOPMENT

527. James P. Merchant, of David M. Dornbusch & Co., Inc., qualified by the United States as an economist, testified on present and future mineral development on the Wind River Indian Reservation. Mr. Merchant studied the available information concerning mineral resources on the reservation, investigated the characteristics of mining and processing industries associated with minerals, and identified and evaluated trends in mining and processing industries. He did not utilize the more speculative cost-returns analysis method. Through his research the United State's expert determined that it is economic to develop the following minerals on the reservation presently or in the future: oil, natural gas, coal, uranium, phosphate rock and gypsum. United States Exhibits WRIR C-28, WRIR C-29 and WRIR C-33B. Tr. 943, 230, 486, 487, 707.

Wyoming's Response:

527. Mr. Merchant holds a bachelors degree in economics, but his graduate degrees are in business administration and law. Tr. 185 (Merchant). An undergraduate degree in economics hardly qualifies one as an expert in natural resource economics. Even if Mr. Merchant were a qualified natural resource economist, however, he would not be qualified to establish the existence of mineral deposits on the Wind River Indian Reservation. As Mr. Merrill pointed out:

> You have a witness who is going to tell you what mineral deposits there are out there, he is going to tell you where they are, how he located them, how they can be brought out, what is going to be done with them, how big a plant can be, all of these sorts of things that are all beyond the field of general economics.

Tr. 549 (Merrill).

The Special Master responded by saying:

> The economist on the stand may continue to testify to those things as expertise gives him a right to, but I would doubt if it would go to telling us what that coal field contains unless he had some first hand knowledge . . . Mr Merrill, I think you made a good point.

Tr. 550 (Special Master).

The United States never did establish the extent of mineral deposits on the Reservation except through the testimony of an economist. Furthermore, the water

requirements testified to by Mr. Merchant are hardly in a form that is meaningful to the Court. To the contrary, Mr. Merchant testified only to peak water use for various proposed developments. Tr. 597 (Sleater). As the Special Master noted with regard to the U.S. Exh. WRIR C-29:

> You see, the Exhibit raises in my mind a fear that you are going to seek to have me believe that there is going to be a need simultaneously for all the water listed in the last column and nothing is really further from what the truth is or what you portend.

Tr. 598 (Special Master).

The Special Master went on to ask:

> Can the witness help us with what the ordinary routine, expected normal requirements might be over the next 10, 15, 20, 30 years in total usage? Then the Exhibit would have more value to me.

Tr. 599 (Special Master).

This query went unheeded; there is no response to this request anywhere in the Record.

United States Proposed Finding of Fact:

529. Gary Watts, the State's witness, reviewed the United States' and the Tribes' Statement of Claims and Mr. Merchant's testimony. He testified that in his opinion there are some mineral deposits on the reservation, but the existence of these deposits does not necessarily mean that it is economically feasible to develop them now or in the future. Mr. Watts admitted that he has not conducted any independent feasibility study regarding future development of these or any other minerals on the reservation, or any analysis of the water requirements to which Mr. Merchant and Mr. Page testified. Furthermore, Mr. Watts did not present any evidence supporting is claim that there are substitutes available that will render these minerals useless or obsolete. Tr. 1151, 11555-556, 11590, 11590-593.

Wyoming's Response:

529. Mr. Watts is a natural resource economist who has had substantial experience studying the economic feasibility of coal development in Wyoming, the location of coal gasification facilities, underground coal mining and the potential economic impact of coal-fired plants. Mr. Watts was qualified as an expert natural resource economist by the Master without objection by the United States and Tribes. Tr. 11551 (Special Master). Mr. Watts did testify that he did not conduct in-depth studies of mineral development on the Wind River Indian Reservation, Tr. 11590; he did testify, however, that "using those facts in making a judgment gives you some indication of what the potential feasibility is." Tr. 11590. Mr. Merchant made it quite clear that his opinions concerning the feasibility of mineral development on the Wind River Indian Reservation were based on his own experience and knowledge, rather than upon a study of costs and returns. Tr. 717. Under the circumstances, the Court must find that Mr. Watts is much more qualified to render professional opinions concerning feasibility than Mr. Merchant.

United States Proposed Finding of Fact:

531. Both Mr. Merchant and Mr. Page, the United States expert economist and hydrologist, testified that 6,580 acre feet of water per year presently are required for secondary recovery operations at these three sites. For Steamboat Butte, 1,030 acre feet per year are diverted from the Wind River, and the remainder used is groundwater. Mr. Page testified that water is produced in conjunction with secondary recovery operations at Steamboat Butte and that produced water is reinjected into the oil wells. There is no discharge. United States Exhibit WRIR C-31A, Table 4. Tr. 513-14, 814, 919.

Mr. Watts, the State's witness, testified that 94 acre feet per year are taken out of permitted ground wells, and nine or ten times that much water is being used from the produced water from the oil wells. Mr. Watts claimed that water is not being drawn from the Madison or other formations. Tr. 11572-573.

Wyoming's Response:

531. Mr. Watts testified that only 94 acre-feet annually are actually being taken out of the Wind River through nearby groundwater wells. The remaining water used for recovery in the Steamboat Butte Field is water produced as a part of the on-site oil recovery process. Tr. 11573. Mr. Watts testified that of the total 6,500 acre-feet of water presently required for secondary operations, 3,994 acre-feet come from groundwater wells while the remainder is produced as a part of the secondary recovery process itself. Tr. 11571, 11575 (Watts).

United States Proposed Finding of Fact:

534. Both the United States's and the State's witness stated, on direct examination, that there is not sufficient basis to make a water claim for future oil development needs. On cross-examination, however, Mr. Merchant admitted that the prospect of substantially higher oil prices in future years may increase the amount of recoverable reserves because (1) higher prices would allow recovery of oil that was not profitable to recover before, and (2) higher prices will elicit more exploration for oil reserves. Greater recoverable reserves would increase the likelihood of increased development. Mr. Watts admitted he had not investigated recent acquisitions of oil and gas leases on the reservation, and was not even aware of the procedure for obtaining exploration and development rights on the reservation. He also testified that he was aware of oil companies' recent interest in development in the Overthrust Belt, and that this may lead to increased oil development on the reservation in the next several years. Tr. 11599-600, 615.

Wyoming's Response:

534. The United States did not claim water for secondary recovery for future uses on the Wind River Indian Reservation, and both Mr. Merchant and Mr. Watts testified that there was no evidence that such a need would arise. Tr. 515 (Merchant); Tr. 11571 (Watts).

United States Proposed Finding of Fact:

536. Since it is reasonable to expect that there will be future oil development on the reservation, particularly in view of the prospect of substantially higher oil prices in future years and the commensurate increase in recoverable reserves, the use of 6,580 acre feet annually should not be restricted to existing secondary oil recovery operations. Instead that amount should be available to the Tribes so long as it is needed for secondary oil recovery.

Wyoming's Response:

536. This Finding is totally unsupported by evidence in the Record, and is directly contradicted by the testimony of both expert witnesses, Mr. Merchant, Tr. 515, and Mr. Watts, Tr. 11571.

United States Proposed Finding of Fact:

540. Mr. Merchant testified that the natural gas sweetening and dehydrating plant presently requires 6 acre feet of water per year, and the sulphuric acid plant requires 95 acre feet per year. This water is derived from groundwater sources in the Wind River formation. Mr. Watts, the State's expert economist, did not evaluate or contradict these findings. United States Exhibit WRIR C-31A, Table 4. Tr. 517, 519, 520, 11591; 11677-678.

Wyoming's Response:

540. Mr. Watts did not contradict the natural gas sweetening and sulfuric plant requirements testified to by Mr. Merchant. Mr. Watts testified that the sulfuric acid plant does not use any sulfur nor natural gas from the Reservation in producing sulfuric acid. Tr. 11577-11578. Furthermore, the Court was presented with no evidence that the natural gas sweetening plant makes use of mineral resources held in trust by the United States for the Tribes.

United States Proposed Finding of Fact:

541. The United State's expert, Mr. Merchant, also concluded that it would be economically feasible for an anhydrous ammonia plant to be developed in the future on the reservation, possibly near Riverton. In reaching this conclusion, Mr. Merchant looked at long-term trends and the probable market area for production of nitrogen fertilizers. He also found that the natural gas production on the reservation exceeds the requirements of such a plant. Tr. 520-22, 529.

The plant envisioned by Mr. Merchant would produce 1,000 tons per day. This size plant, which is the smallest size at hich economies of scale normally are achieved, was chosen partially on the basis of the availability of natural gas. Tr. 527-28.

Wyoming's Response:

541. The Court should not be misled into believing that Mr. Merchant conducted feasibility analyses for mineral development on the Reservation. In his own words, Mr. Merchant testified "I did not develop detailed cost [sic] returns for these mineral enterprises." Tr. 709. The scope of his analysis was further defined through the following exchange:

> Q. So, based on that general phenomenon for these resources, rather than any empirical analysis, it's your opinion that it would be commercially feasible to recover these resources sometime in the next 40 years?
>
> A. I think that statement was empirical.
>
> Q. Do you mean you have some empirical analysis to support what you are saying?
>
> A. I've been looking at energy issues for several years, and I think based on my experience in doing that that I can make that statement based on my own personal knowledge.

Tr. 717 (Merchant) (emphasis added).

United States Proposed Finding of Fact:

543. The State's witness, Mr. Watts, testified that the development of an anhydrous ammonia plant was a very speculative prospect. Mr. Watts claimed that the feasibility analysis for the plant must look at the lost opportunity costs resulting from diverting natural gas from current uses to use for the ammonia plant. Mr. Watts did not conduct any such feasibility study, however, and he would not say that such a plant would never be built on the reservation. Tr. 11578-580.

Wyoming's Response:

543. Mr. Watts' testimony obviously contradicts that of Mr. Merchant; and although neither witness did in-depth studies of feasibility, Mr. Watts' credentials are clearly superior to Mr. Merchant's with respect to the potential for mineral development on the Reservation.

United States Proposed Finding of Fact:

544. As to future production levels of natural gas, Mr. Merchant testified on cross-examination that the price of natural gas probably will substantially increase after prices are deregulated as required under existing law. The increase in prices could well increase the amount of recoverable natural gas reserves, and result in increased production, in much the same way as for oil. Tr. 613-16.

Wyoming's Response:

544. See Wyoming's Response to United States' Proposed Finding of Fact 541.

United States Proposed Finding of Fact:

545. There are several natural gas fields under production on the Wind River Reservation, specifically those identified on United States Exhibit WRIR C-23. There is a natural gas sweetening and dehydrating plant located east of Riverton, and a sulphuric acid plant southwest of Riverton. The processing plant requires 6 acre feet per year for processing natural gas, and the sulphuric acid plant requires 95 acre feet per year for its operations. The source of this water is groundwater from the Wind River formation.

Wyoming's Response:

545. See Wyoming's Response to United States' Proposed Finding of Fact 540.

United States Proposed Finding of Fact:

546. It is technically and economically feasible that an anhydrous ammonia plant be located on the reservation in the next 40 years, and that plant would require 4,250 acre feet per year of water, to be derived from the Wind River formation.

Wyoming's Response:

546. Based upon the testimony of both witnesses, there is no evidence in the Record supporting the technical or economic feasibility of anhydrous ammonia plant to be located on the Reservation within the next 40 years. See Wyoming's Response to United States' Findings of Fact 541 and 543.

United States Proposed Finding of Fact:

547. There is substantial probability that recoverable natural gas reserves will increase as prices increase in the future, and that natural gas production may increase commensurate with increased demand. There must therefore be reserved to the Tribes an amount of water sufficient to develop these natural gas resources.

Wyoming's Response:

547. See Wyoming's Response to United States' Proposed Findings of Fact 541 and 543.

United States Proposed Finding of Fact:

C. Coal

548. Mr. Merchant identified coal deposits on the reservation, described the deposits that in his opinion are suitable for development, and outlined the water requirements and water sources for development of these deposits.

Based on a United States Bureau of Mines report and a United States Geological Survey report, among other things, Mr. Merchant concluded that there are coal deposits in the Alkali Butte field in the southeast corner of the reservation, in the Muddy Creek area in the northern part of the reservation, near the surface in the Hudson area, and deep deposits between two locations as indicated on United States Exhibit WRIR C-24. There have been small mining operations in the Hudson area. Mr. Merchant concluded that the coal deposits at the Alkali Butte and Muddy Creek locations are suitable for development. Tr. 547-48, 550-52.

Wyoming's Response:

548. Although Mr. Merchant did reach the conclusions outlined in this finding, he should not have been allowed to do so. As the Special Master pointed out,

> the economist on the stand may continue to testify to those things as expertise gives him a right to, but I would doubt if it would go to telling us what that coal field contains unless he had some first hand knowledge . . . Mr. Merrill, I think you made a good point.

Tr. 550 (Special Master). There is no evidence in the Record that Mr. Merchant has first-hand knowledge of <u>any</u> mineral deposits on the Reservation.

United States Proposed Finding of Fact:

549. Mr. Merchant found that the coal reserves at Alkali Butte are suitable for development through underground coal gasification. In reaching this conclusion; Mr. Merchant looked at both the technical and economic feasibility. He found that the coals in that location, which are of subbituminous rank, are at least 5 feet thick and are overlaid by sufficient overburden to be suitable for this process. By looking at industry trends, the grade of available coal, and market projections, Mr. Merchant concluded that in situ gasification would be economically feasible. The source of Mr. Merchant's information on the gasification process was primarily the four or five most recent "Symposium on Underground Coal Gasification", a collection of articles by professionals. Tr. 553, 717.

Wyoming's Response:

549. As pointed out in Wyoming's Response to Tribes' Finding of Fact 240, Mr. Merchant is hardly qualified to testify as to the suitability of developing coal reserves through in situ coal gasification. Not only does such a development involve considerations far outside of the field of economics, Mr. Merchant did not even consider the economic costs of his proposal. Tr. 718 (Merchant).

United States Proposed Finding of Fact:

550. The State's witness, Mr. Watts, while admitting that he is not an expert on coal gasification, had certain reservations about the possible development of a plant. He claimed that, because of the possibility of serious groundwater contamination, and the location of the Alkali Butte coal field at the reservation border, mutual cooperation will be needed between Indians and non-Indians in developing such a plant. He did not find that such cooperation was impossible or even unlikely. Mr. Watts also testified, on the basis of studies relating to moisture content of coal, that no additional water would be required for coal gasification at Alkali Butte. However, Mr. Watts did not consider any other use for water for coal gasification other that the control of burning. Tr. 11583-587, 11583-595.

Wyoming's Response:

550. Mr. Watts, at least, was realistic about the limitations of his expertise as a natural resource economist. Tr. 11583. He did, however, point out certain potential problems that might be incurred in developing the Tribes' coal resources in that way. Tr. 11583, 11587. Mr. Watts' accurate assessment of his own limitations should not lead the Court to believe that the Tribes or the United States have met their burden of proof in establishing the feasibility of *in situ* coal gasification on the Reservation.

United States Proposed Finding of Fact:

551. Mr. Merchant concluded that the in situ gasification process at Alkali Butte would require 2,800 acre feet per year of water. According to the United State's expert hydrologist, Mr. Page, the source of this water would be groundwater from the Wind River, Lance and Mesa Verde formations. United States Exhibit WRIR C-31A, Table 4. Tr. 554, 815-16.

Wyoming's Response:

551. Mr. Watts contradicts Mr. Merchant's testimony by stating that the moisture content of the coal in the particular field under consideration would not require additional water to burn coal in situ, even if it were economically and technically feasible. Tr. 11586.

United States Proposed Finding of Fact:

552. The other location suitable for coal development, as determined by the United State's expert economist, is Muddy Creek. There the coal is shallower than at Alkali Butte, and is suitable for mining. The coal is sufficient to support a 150-megawatt power plant that could be added to interstate transmission lines. Tr. 553-54.

Twenty-five (25) acre feet per year of water would be required at Muddy Creek for dust control and surface reclamation, and 2,490 acre feet per year would be required for the power plant. The water for the mining operations would come from shallow (200 to 500 feet) wells, while the water for the power plant would be derived from the nearest major water source, that is, the Wind River underflow, and through wells such as at Pilot Butte. The water use for the in situ gasification and power plant would be totally consumptive. United States Exhibit WRIR C-31A. Tr. 560, 815-16.

Wyoming's Response:

552. Mr. Merchant's testimony is refuted by Mr. Watts, who testified that the 150 megawatt power plant proposed by Mr. Merchant would exhaust the known coal reserves at the Muddy Creek Field in 13 to 14 years and thus would not be economically feasible. Tr. 11581, 11582 (Watts). Mr. Watts further testified that water use for in situ gasification would be nonexistent. Tr. 11586.

United States Proposed Finding of Fact:

554. Mr. Merchant stated on cross-examination that the United States Geological Survey has identified many reserves on the reservation that are not identified on the United States Exhibit WRIR C-24, and that these may become feasible to exploit in the future. Furthermore, as with oil and gas, the price of coal is likely to increase in the future, thereby increasing the amount of recoverable coal reserves on the reservation. Tr. 616.

Wyoming's Response:

554. Mr. Merchant made it quite clear upon cross-examination that his conclusions concerning future oil, natural gas and coal development were based upon his personal opinion, as opposed to any assessment of economic feasibility. Tr. 717. Although Mr. Merchant is entitled to his opinion, Mr. Watts clearly indicated he disagreed with Mr. Merchant. Tr. 11581. Mr. Watts also is far more experienced in studies dealing with the economic potential for coal development in Wyoming than is Mr. Merchant. See Wyoming's Amended Proposed Finding of Fact 40-2.

United States Proposed Finding of Fact:

555. There are many coal deposits on the Wind River Reservation, as identified on United States Exhibit WRIR C-24. The coal deposits in the Muddy creek area and the Alkali Butte area are suitable for development. At Alkali Butte there are sufficient reserves, with a sufficient overburden, for in situ coal gasification. That process would require 2,800 acre feet of water per year, to be derived from groundwater and aquifers such as the Wind River, Fort Union, Lance and Mesa Verde formations.

Wyoming's Response:

555. For the reasons cited in Wyoming's Response to United States' Proposed Findings of Fact 548 through 554, there is no evidence in the Record for the Court to conclude that in situ coal development on the Reservation is economically or technically feasible.

United States Proposed Finding of Fact:

556. At Muddy Creek, there are shallower coal deposits that are suitable for mining, and sufficient to suply a 150-megawatt power plant. Twenty-five (25) acre feet per year of water would be required for dust control and surface reclamation in connection with mining, and the proposed power plant would require 2,490 acre feet of water per year. The water for mining operations would be derived from shallow wells, and the water for the power plant would be brought to the area from the nearest major water source.

Wyoming's Response:

556. Mr. Watts' testimony concerning the potential economic life and infeasibility of the proposed power plant was not refuted by the Tribes and stands unchallenged. See Tribes' Proposed Finding of Fact 246.

United States Proposed Finding of Fact:

D. Gypsum

557. Mr. Merchant, the expert economist testifying on the United States' behalf, evaluated gypsum development possibilities on the Wind River Reservation by reviewing available information, including USGS and Bureau of Mines reports, on gypsum deposits. He looked at the location, size, grade of gypsum, the characteristics of the gypsum industry, and future industry trends. On the basis of that information, Mr. Merchant determined that the reservation contains massive deposits of high grade gypsum that could be surface mined. By analyzing data on and productivity and sales of wallboard, he concluded that in the future there will be an ample market for wallboard, which is produced using gypsum. Therefore he concluded that it would be feasible to mine the gypsum and use it in a wallboard manufacturing plant. Tr. 585-86, 586, 590, 588, 699.

Mr. Merchant estimated that the manufacturing plant would produce 400,000,000 square feet of one-half inch wallboard per year. The plant probably would be located near Riverton because of its proximity to rail service and the population needed for labor purposes. United States Exhibit WRIR C-27. Tr. 587-77.

Wyoming's Response:

557. Mr. Watts testified that based upon his investigations, including conversations with the Wyoming State Geologist, it was not economically feasible at the present time to develop the gypsum deposits on the Reservation. Tr. 11553, 11554, 11558, 11559. In direct contradiction to Mr. Merchant, Mr. Watts testified that the gypsum deposits on the Reservation are located in steeply dipping beds, meaning that underground mining techniques would be required to exploit the mineral deposits. Tr. 11558, 11559.

United States Proposed Finding of Fact:

558. Gary Watts, the State's expert, stated that in his opinion it is not economically feasible to develop gypsum on the reservation. The gypsum, he claimed, is found in steeply dipping beds, which normally must be removed through more expensive underground, not surface, mining techniques while there are large amounts of gypsum throughout the world that can be surface-.ined. He also stated that substitutes for gypsum may be developed in the future. Mr. Watts did not present any documentation or state any sources for these claims. Tr. 11558-559, 11562.

Wyoming's Response:

558. Mr. Watts specifically stated the scope of his studies and the sources of his information on transcript pages 11552-11555.

United States Proposed Finding of Fact:

559. Surface reclamation in connection with mining gypsum on the reservation would require 10 acre feet of water per year from local groundwater. Based on a conversation with the plant engineer at a gypsum wallboard plant in Cody, Wyoming, Mr. Merchant concluded that the wallboard manufacturing plant would require 300 acre feet per year. Either surface water or groundwater could be used for the plant. Mr. Watts, the State's witness, did not review or contradict these water claims. United States Exhibit WRIC C-31A, Table 4. Tr. 587-88.

Wyoming's Response:

559. Mr. Watts contradicted Mr. Merchant's testimony concerning gypsum mining on the Reservation and its associated water requirements by stating quite clearly that in his professional opinion it is highly unlikely that these resources will be developed in the foreseeable future. Tr. 11561. Thus, it would be meaningless to postulate water requirements.

United States Proposed Finding of Fact:

600. The gypsum deposits are located in the aesthetics area defined by the United State's experts, and the Tribes ultimately will have to choose between preserving this area and developing the gypsum. Tr. 592.

Wyoming's Response:

600. This Finding is just another example of inconsistencies in the United States' and Tribes' claims for water for mineral development.

United States Proposed Finding of Fact:

601. In Summary, there are massive gypsum deposits on the Wind River Reservation. It is technically and economically feasible to mine these deposits and to locate a wallboard manufacturing plant on the reservation. Gypsum mining would require 10 acre feet per year of surface water, and the wallboard manufacturing plant would require 300 acre feet per year of surface or groundwater.

Wyoming's Response:

601. Based on Wyoming's Response to United States' Findings of Fact 557 through 600, the Court should conclude that there is no evidence concerning the economic feasibility of mining gypsum deposits on the Wind River Indian Reservation; and if there were, there is no evidence concerning what normal annual water requirements might be. See Wyoming's Response to United States' Finding of Fact 527.

United States Proposed Finding of Fact:

E. Uranium

602. The United State's expert, Mr. Merchant, testified that there are indications of uranium deposits in the Aycross formation in the northwest corner of the reservation, with a quality of one-tenth of one percent uranium content. He concluded that, although the basic field work has not been done to positively locate these deposits, the increasing interest in uranium makes it likely that such field work will be carried out in the future. United States Exhibit WRIR C-25. Tr. 567-68.

Wyoming's Response:

602. This proposed Finding and Mr. Merchant's testimony make it clear that there is no conclusive evidence that uranium deposits even exist on the Wind River Indian Reservation. Without evidence that uranium deposits exist, there is absolutely no basis in the Record for awarding a water right for their development.

United States Proposed Finding of Fact:

603. To determine future development possibilites for uranium, Mr. Merchant analyzed the characteristics of other uranium mines in Wyoming, particularly the grade of uranium and the size of the mines, and reviewed uranium industry trends. On the basis of those studies, he concluded that development of uranium deposits would be economically feasible.[18/] If deposits are found, they would be mined by underground mining, then the ore would be beneficiated or refined into yellowcake and shipped off the reservation for further processing. Tr. 568, 707-08.

18/ Mr. Merchant admitted that uranium prices have been volatile over the past several years, but stated that these fluctuations appeared to be based largely on political events. And although federal regulation of uranium may tend to raise development and production costs, the price of uranium also is likely to increase because of the increased future demand for energy. Tr. 712-16.

Wyoming's Response:

603. The statement, "if the deposits are found, they would be mined by underground mining," is so speculative as to hardly deserve comment.

United States Proposed Finding of Fact:

604. Mr. Merchant determined that uranium mining activities would require 15 acre feet per year of water for dust control and incidental uses. He further concluded that, based on Cameron's Engineers Report on Mineral Industries in Wyoming, processing uranium into yellowcake would require 475 acre feet per year. The water would be drawn from local shallow to moderate depth groundwater, and from the Wind River formation or Crow Creek surface flow. United States Exhibit WRIR C-31A, Table 4. Tr. 568-69, 571.

Wyoming's Response:

604. Mr. Merchant's speculation that if any uranium deposits are found, they would be mined by underground mining, is dwarfed by his guess that 15 acre-feet of water per year for dust control might be required. This testimony again hardly meets the burden of proof that water for uranium development will be required in the future on the Wind River Indian Reservation.

United States Proposed Finding of Fact:

605. The State did not offer any evidence on uranium development on the reservation.

Wyoming's Response:

605. The State of Wyoming did not offer any evidence on uranium development on the Reservation because there is no evidence that uranium even exists on the Reservation. Tr. 567-568 (Merchant).

United States Proposed Finding of Fact:

606. There are indications of uranium deposits on the reservation. The uranium, if it exists, is likely to be mined through undergound mining and processed into yellowcake on the reservation. Mining would consume 15 acre feet per year of water for dust control and incidental uses, and processing would require 475 acre feet of water per year. The water will be drawn from local shallow to moderate depth groundwater, the Wind River formation, or the Crow Creek surface flow.

Wyoming's Response:

606. This Finding is the final cap on a pyramid of pure speculation that has no factual support in the Record and should be rejected by the Court.

United States Proposed Finding of Fact:

F. Phosphate Rock

607. James Merchant also analyzed the possibility of future development of phosphate rock on the Wind River Reservation. He determined, by reviewing available information on phosphate deposits, that there are extensive phosphate deposits on the reservation. By analyzing the characteristics of the phosphate industry, trends in the production of phosphoric acid, and technological suitability of grades of phosphate rock for processing, the United States' expert concluded that there is increasing demand for phosphate in the United States and concluded that phosphate rock on the reservation could be mined, then shipped to a plant in the Riverton area for beneficiation and use in a wet acid processing plant. Mr. Merchant testified that, although the phosphate rock is of a fairly low grade, it is capable of beneficiation. United States Exhibit WRIR C-26. Tr. 573-74, 619-20.

Wyoming's Response:

607. The Court should again be reminded that Mr. Merchant testified concerning his own personal knowledge, Tr. 717 (Merchant), and that his testimony was refuted by Mr. Watts, who testified that it was unlikely that phosphate rock deposits on the Reservation would be developed in the foreseeable future. Tr. 11561 (Watts).

United States Proposed Finding of Fact:

608. Mr. Watts, the State's witness, stated that in his opinion it is not economically feasible to develop phosphate rock. He claimed that, as with coal and gypsum, the resource is in steeply dipping beds, and must be mined by the more expensive underground mining method while there is a great deal of phosphate rock throughout the country that can be mined by cheaper strip mining techniques. Furthermore, he claimed that substitutes obviating the need for phosphate rock may be developed in the future. Mr. Watts did not audit Mr. Merchant's figures or present any specific evidence to support his conclusion. Tr. 11558-559. Tr. 11561-570.

Wyoming's Response:

608. Mr. Watts' background and experience as a natural resources economist, and the sources upon which he relied to form his opinions are specified in the transcript at pages 11544 through 11556 (Watts).

United States Proposed Finding of Fact:

609. .Mr. Merchant and Mr. Page concluded that phosphate rock mining would require 5 acre feet per year of water, which could be drawn locally from on-site wells near the mine. Beneficiation would consume 425 acre feet of water per year, and production of phosphoric acid would consume 400 acre feet of water per year. In the Riverton area this water could be drawn from the Wind River formation or from surface water. Mr. Watts did not review the United States expert's conclusions on water requirements and sources. United States Exhibit WRIR C-31A, Table 4, Tr. 574-75, 817, 818.

Wyoming's Response:

609. Mr. Watt's did not review the government experts' conclusion on water requirements and sources because he testified that it would not be economically feasible to develop phosphate rock deposits on the Reservation in the foreseeable future. Tr. 11561 (Watts).

United States Proposed Finding of Fact:

610. There are low grade phosphate rock deposits on the Wind River Reservation, including but not limited to those identified on United States Exhibit WRIR C-26. It is economically feasible to develop these minerals in the future by mining, beneficiation, and use in a wet acid processing plant. Mining will require five (5) acre feet per year of water, to be drawn from on-site wells. Beneficiation will consume 425 acre feet of water per year, and wet acid processing 400 acre feet per year of water, which will come from available wells, surface water, or, if near Riverton, the Wind River formation.

Wyoming's Response:

610. Based upon Wyoming's Response to United States' Findings of Fact 607 through 609, the Court should conclude that there is not sufficient evidence concerning the economic feasibility of phosphate rock development on the Wind River Indian Reservation.

United States Proposed Finding of Fact:

614. The Indians residing in Riverton which, as stipulated by the State, United States and Tribes, is located within the reservation, are entitled to water for their projected needs. Mr. Fassett's contention that a dual water system will be needed to serve the Indians is unwarranted. Tr. 11619.

Wyoming's Response:

614. The United States misrepresents the Record. Mr. Fassett stated it would be very difficult to administer a dual water right system, Tr. 11619, for example, some small portion of the City owning a very senior reserved right and the remaining portions of the City supplied through state-awarded surface and ground water rights, all serviced by a single, integrated municipal water system. Once the water is diverted and treated, it feeds a single integrated municipal water distribution system serving all residents of the City. It would be physically impracticable to attempt to serve only portions of the City's residents with their own separate water supply or to administer portions of the system separately.

United States Proposed Finding of Fact:

615. Mr. Merchant's reliance on existing daily per capita water use at Fort Washakie of 325 gallons is reliable. Mr. Fassett's proposed per capita allocation of 220 gallons is not provided with support sufficient to overcome Mr. Merchant's conclusion.

Wyoming's Response:

615. Mr. Fassett stated that Mr. Merchant's water use figure for Fort Washakie was high. Tr. 11616. Furthermore, even Mr. Merchant admitted that the Fort Washakie per capita value was almost twice the national average water consumption. Tr. 449. See Wyoming's Proposed Findings of Fact 12-1 et seq. The Master made specific reference to the Fort Washakie value and left that portion of the U.S. Exh. WRIR C-20 "in limbo," due to cross-examination over this figure alone. Tr. 457. Neither the United States nor the Tribes cross-examined Mr. Fassett regarding his research and study to derive the 220 gallons per capita per day value for Fort Washakie. Tr. 11622-11623.

United States Proposed Finding of Fact:

618. Mr. Fassett accepted the per capita water requirements for the City of Riverton but disagreed that there was a need to make a reserved water right claim for Indians living in Riverton. Tr. 11619.

Wyoming's Response:

618. Transcript page 11620 should also be cited.

United States Proposed Finding of Fact:

619. Mr. Fassett concluded that Mr. Merchant overestimated the daily per capita water requirement for Fort Washakie at 325 gallons. However, Mr. Merchant's figure is based on actual useage. Mr. Fassett's conclusion of 220 gallons per day was estimated and not confirmed in the field. Tr. 486, 11616-18.

Wyoming's Response:

619. Mr. Fassett testified that he was unable to confirm Mr. Merchant's contacts and sources for data due to the ongoing nature of the lawsuit. Tr. 11616-11617. Furthermore, Mr. Merchant's 325 gallons per capita per day value was challenged by Wyoming and three private parties. As a result, the Master held this portion of U.S. Exh. WRIR C-20 "in limbo." Tr. 406-457. The United States and Tribes never challenged to Mr. Fassett's testimony. Tr. 11622-11623.

United States Proposed Finding of Fact:

XIII. FISHERY

The United States adopts, and hereby incorporates by reference, the findings of fact submitted by the tribes in this case in support of the claim that fishing was a purpose for creating the Wind River Reservation.

620. There are sixteen streams or portions of streams on the Wind River Indian Reservation which are of primary or potential importance for fisheries for the Shoshone and Arapahoe Indian Tribes. These streams are subject to impacts from existing and potential water development. Tr. 6361-63, 6366, 6654, United States Exhibit WRIR C-280, pp. 9, 21-87, United States Exhibit WRIR C-281.

Wyoming's Response:

620. Neither the United States nor the Tribes presented any evidence to show that any portion of any of the streams claimed is important to the Tribes for fishing. The only evidence presented as to use of fish by the Tribes was historic use by the Shoshones. Omer Stewart testified with respect to this but only indicated that when the Shoshones found fish, they ate them. Tr. 9114. They also relied upon many other food items. Tr. 9116, 9120. There was no evidence prescribed that they were ever dependent upon fish. He admitted that the Arapahoe, however, traditionally were not fishermen. Tr. 9129. Also, there is no evidence that Congress was aware of any use of a reliance on fish by the Shoshone Tribe when the Wind River Indian Reservation was formed and, therefore, Congress could not have intended to reserve water for fisheries.

The purpose for which water may have been reserved for the Wind River Indian Reservation, to establish a land-based agrarian society, stands in contrast to, for example, the parallel purpose found in Colville Confederated Tribes v. Walton, 647 F. 2d 42, 48 (1981):

> The Colvilles traditionally fished for both salmon and trout. Like other Pacific Northwest Indians, fishing was of economic and religious importance to them. [Citations].

The Tribe's principal historic fishing grounds on the Columbia River have been destroyed by dams. The Indians have established replacement fishing grounds in Omak Lake by planting a non-indigenous trout.

The Shoshone and Arapahoe settled on the Reservation to pursue agriculture rather than live as nomadic hunters. The Colvilles' traditional and extensive reliance on fishing continued long after their settlement on a reservation and represented a central factor of their existence and their culture.

United States Proposed Finding of Fact:

622. Among those methods is the Cooperative Instream Flow Group (IFG) incremental methodology which was developed by U.S. Fish & Wildlife Service and which was used by the United States to prepare claims in this case. Tr. 6337-38, 6340-42, 6346, 6574-76, United States Exhibit WRIR C-280.

Wyoming's Response:

622. This statement is misleading. The United States only used the PHABSIM portion of the Instream Flow Group ("IFG") Incremental Methodology. See Wyo. Exh. WRIR FISH 1A (p. 21).

United States Proposed Finding of Fact:

625. The witness for the United States, David A. Vogel, applied the IFG incremental methodology in a scientific and professional manner according to the guidelines of the IFG. His field work included more than 60 days of on-site visits to the rivers and streams he studied and more than 3,000 measurements of stream characteristics relating to velocity, depth and substrate. Mr. Vogel analyzed the results of his field work with computer programs prepared by the IFG. United States Exhibit WRIR C-280, pp. 9-18, Tr. 6360-6553.

Wyoming's Response:

625. In light of the numerous errors made by Mr. Vogel in performing his analysis, his work should not be characterized as scientific and professional according to the guidelines of the IFG Incremental Methodolgy. In many instances, Mr. Vogel failed to perform his analysis according to the IFG guidelines. See generally Wyoming's proposed Finding of Facts 45-5.

United States Proposed Finding of Fact:

626. The hydrologic data required for use of the IFG incremental methodology was developed by Michael Keene of H.K.M. Associates, a witness for the United States, and provided to Mr. Vogel by Mr. Keene. Tr. 6478, 7136-41, 7148.

Wyoming's Response:

626. In fact, the figures provided to Mr. Vogel by Mr. Keene were not the same ones testified to by Mr. Keene at trial. They were an earlier version that had changed. See Wyoming's proposed Finding of Facts 45-5; Tr. 7147-7148 (Clear).

United States Proposed Finding of Fact:

627. Instream flows recommended by Mr. Vogel to provide the optimum habitat for the fish species he considered are expressed in terms of mean monthly instantaneous flows. United States Exhibit WRIR C-280, pp. 19-20, Tr. 6491-92.

Wyoming's Response:

627. The United States admits that it is seeking to optimize habitat, not provide for minimum flows. See U.S. Exhibit C-280 (p. 1).

United States Proposed Finding of Fact:

629. Based on the evidence received at trial, the following non-consumptive instream flows are needed to maintain optimum habitat for fishery resources on the Wind River Indian Reservation. The flows are based on a one in two year low flow recurrence interval and are expressed as mean monthly instantaneous flows.

Wyoming's Response:

629. Generally, the values depicted for Reach 1 on page 203 of the United States' Proposed Findings of Fact do not coincide with either their Statement of Claim or the testimony of Mr. Vogel.

United States Proposed Finding of Fact:

631. Additional official documentary evidence was introduced by the United States regarding the land title and status of lands around Boysen Reservoir, upon which certain lands claimed as irrigable by the United States exist. United States Exhibits WRIR C-318, WRIR C-319, Tr. 7862-7870.

Wyoming's Response:

631. The United States has no standing to claim water rights for lands acquired for Boysen Reservoir by the United States since these lands are no longer held in trust by the United States for the Tribes or individual Indians. The Tribes also have no standing to claim these lands since those lands are neither held in trust nor Indian-owned fee.

The Tribes were compensated $458,000 in 1952 to relinquish the trust patents and rights of occupancy. They reserved oil, gas and mineral rights, access for grazing and stockwatering and a limited right to continued occupancy "when such lands are not inundated by Boysen Reservoir waters." These rights exist "so long as the lands abutting thereto remain subject to the occupancy rights of said Tribes" and "shall be regarded, and it is hereby made, an easement appurtenant to such abutting lands." However, the right of occupancy "shall be extinguished forthwith upon the termination by any means of the Indian occupancy." See Memorandum of Understanding Between the Bureau of Reclamation and the Office of Indian Affairs Covering Compensation for Indian Lands Taken for the Boysen Unit of the Missouri River Basin Project at 60 (U.S. Exh. WRIR C-318); see generally U.S. Exh. WRIR C-318.

There is no evidence in the Record regarding the maintenance of occupancy by the Tribes. Coupled with the uncertainty of the existence of the right to irrigate these lands and the feasibility of irrigation development on lands which can be inundated periodically, it is impossible to determine that the land is practicably irrigable. The Master noted that the land status is different and, therefore, the reserved right cannot be the same as elsewhere on the Reservation. Tr. 7865.

United States Proposed Finding of Fact:

632. All of the land that the United States claims to be "practicably irrigable acreage" is currently held in trust by the United States. United States Exhibit WRIR C-317.

Wyoming's Response:

632. Not all lands for which the United States claims received water rights are currently held in trust by the United States for the benefit of the Tribes or individual Indians. U.S. Exhs. WRIR C-317 and C-318. Those lands not currently held in trust by the United States are: unadjudicated in-use tracts 2-11, 2-69, 5-53, 8-7, 8-8, 8-9 and 19-12; Type VII tract 1-48X; and Type VII tract 6-7X; these comprise 131.6 acres having a diversion requirement of 487.3 acre-feet and net irrigation requirement of 243.7 acre-feet. See Wyoming's Proposed Findings of Fact 28-10.b.6 and 28-10.b.16 and support therefor. In addition, all of Riverton East pump station 9 and a portion of pump station 8 are not held in trust by the United States, but rather occupy land withdrawn for Boysen Reservoir.

The fact that the remainder of the lands asserted by the United States, with the possible exception of the Arapahoe Ranch, is currently held in trust ignores the critical dependence of the existence and date of reserved water rights on ownership history. Only those lands determined to be practicably irrigable acreage which are unallotted and have continuously been held in trust by the United States since July 3, 1868 are subject to a reserved

right. See Wyoming's proposed Findings of Fact 28-1 et seq. The Arapahoe Ranch lands north of the stipulated boundary of the Reservation have no evidence of trust ownership. See Wyoming's Response to United States' proposed Finding of Fact 634.

United States Proposed Finding of Fact:

633. All land except as described in Finding number was reserved as part of the Wind River Indian Reservation by the Treaty of July 3, 1868. United States Exhibit WRIR C-317.

Wyoming's Response:

633. The State of Wyoming is unable to respond to this proposed finding since the reference to an exception contained in another proposed finding has no finding number assigned.

United States Proposed Finding of Fact:

634. Certain lands north of the stipulated boundaries of the Wind River Indian Reservation have been purchased, and are currently held, in trust by the United States. The United States claims water rights for the following lands indicated by the tract numbers associated therewith at trial. The date of purchase and, where appropriate, the state adjudicated water right date are shown.

ARAPAHOE RANCH
MERRILL LAND PURCHASE
LANDS NORTH OF SOUTH FORK OF OWL CREEK

Date of Purchase

July 14, 1948

TRACT #	DITCH NAME	PERMIT #	PROOF #	ACRES	PRIORITY DATE	U.S. EXHIBIT #
33-8C	Typer #4	11707	14032	64	05-16-1912	WRIR-129
33-9C	Riggs	6621	14024	27	06-20-1904	WRIR-129

TRACT #	DITCH NAME	PERMIT #	PROOF #	ACRES	PRIORITY DATE	U.S. EXHIBIT #
33-2	Tyder 3#	10719	N/A	9.4	8-21-1911	WRIR-134

PADLOCK RANCH PURCHASE
LANDS NORTH OF MAINSTEM OF OWL CREEK

Date of Purchase

April 10, 1941

TRACT #	DITCH NAME	PERMIT #	PROOF #	ACRES	PRIORITY DATE	U.S. EXHIBIT #
34-1C	Sliney & Mikkelson	Terr.	3226	122.63	10-1884	WRIR-132
34-2C	Sliney & Mikkelson	Terr.	3526	32.0	10-1884	WRIR-136
34-3C	Sliney & Mikkelson	Terr.	3527	222.63	10-1884	WRIR-132
34-4C	Padlock	Terr.	3534	224.35	06-1887	WRIR-136
34-5C	Dewitt	2306	6271	17.0	10-04-1899	WRIR-132
34-6C	Sliney No. 1	4038	8350	160.0	07-11-1902	WRIR-132
34-7C	Sliney No. 1	4038	8351	160.0	07-11-1902	WRIR-132
34-8C 1	Rothwell Enl. of Sliney No. 1	2125E	15024	85.0	09-17-1909	WRIR-132
34-8C 2	Rothwell Enl. of Sliney No. 1	2125E	15024	233.0	09-17-1909	WRIR-132

United States Proposed Finding of Fact:

PADLOCK RANCH PURCHASE
LANDS NORTH OF MAINSTEM OF OWL CREEK

Date of Purchase

April 10, 1941

TRACT #	DITCH NAME	PERMIT #	PROOF #	ACRES	PRIORITY DATE	U.S. EXHIBIT #
34-9C	Padlock	Terr.	3533	252.0	06-1887	WRIR-132
34-10C	Padlock	Terr.	3534	41.0	06-1887	WRIR-132
34-11C	Padlock	Terr.	3534	284.44	06-1887	WRIR-135

TRACT #	DITCH NAME	PERMIT #	PROOF #	ACRES	PRIORITY DATE	U.S. EXHIBIT #
34-1	Padlock	N/A	N/A	24.0	N/A	WRIR-132
34-2	Sliney #1	N/A	N/A	12.0	N/A	WRIR-132
34-4	Padlock	N/A	N/A	5.0	N/A	WRIR-135

TRACT #	DITCH NAME	PERMIT #	PROOF #	ACRES	PRIORITY DATE	U.S. EXHIBIT #
34-1X	Padlock	N/A	N/A	43.1	N/A	WRIR-132
34-5X	Sliney No. 1	N/A	N/A	44.0	N/A	WRIR-132

Wyoming's Response:

634. There is no evidence in the Record regarding the ownership and date of purchase of lands north of the stipulated boundaries of the Reservation. The Proposed Finding offers no assistance since it is not cited.

United States Proposed Finding of Fact:

XV. WYOMING SYSTEM OPERATION

635. State of Wyoming consultants Mr. Leonard Rice and Mr. Gordon Fassett testified regarding the development of, and results achieved by, a computer model developed in an attempt to see what adverse effect the United States claims for water rights might have on persons exercising State water rights.

Wyoming's Response:

635. No citation to the Record was provided in support of this Finding. The United States, in this statement and throughout its Proposed Findings of Fact has seriously misunderstood the two analyses testified to by Mr. Rice and Mr. Fassett regarding the Wyoming river basin system operations studies. The State of Wyoming presented evidence, through Mr. Rice and Mr. Fassett regarding (1) water availability with respect to United States and Tribal claims as part of the determination of practicably irrigable acreage (Wyo. Ex. MF-16A - MF-21B) and (2) resultant affects upon existing state-awarded rights as a result of the granting and utilization of the United States and Tribal claims (Tr. 9645, 10058 and Wyo. Exhs. MF-8 2nd Rev., MF-9 Rev. and MF-10 2nd Rev., see Wyoming's Amended Proposed Finding of Fact, Sections 15, 27 and 42 and support therefor).

United States Proposed Finding of Fact:

636. The model developed by the State's consultants was not limited to the area of the reservation, but was designed to compute water supply and demand through out the Big Horn basin. It was thus not designed to rebut or challenge the results of Mr. Keene's natural flow analysis or Mr. Billstein's systems operation _tudy. Tr. 9504. However, the State of Wyoming stated "for the record" that it has no quarrel with the results of those studies and feels that Mr. Billstein did a good job. Tr. 10031. 19/

19/ The transcript indicates that this statement was made by Mr. Clear but it was, in fact, made by Mr. White, counsel for the State of Wyoming.

Wyoming's Response:

636. The second statement of this Finding is an incorrect interpretation by the United States. The Wyoming model does operate throughout the entire Big Horn River drainage, including approximately 30 streams within the Wind River Indian Reservation (Wyo. Exh. MF-14 series of maps). The model utilizes virgin (natural) streamflow information developed under Mr. Fassett's direction, that was very similar to the total basin results developed by Mr. Keene, (Tr. 9405), and was developed to challenge the results of Mr. Billstein's water availability and system operation studies. There is no reference to refute this fact at Tr. 9504 as cited by the United States or anywhere else in the Record. Mr. Billstein testified that that with use of irrigation management, all the agricultural claims made by the United States could be met from available supplies. Mr. Fassett's testimony and supporting exhibits (MF-16A through and including MF-21B) indicated there was not enough water to meet the claims of the United States. How could the State's position be any clearer with respect to rebutting Mr. Billstein's testimony?

The United States has also misquoted Mr. White's statement on the record (Tr. 10031) which is reproduced below:

> by Mr. White . . . And I might say, for the record, that in light of limited purpose for which their model was used, we have no significant quarrel with it, we have complaints in small places. But generally, we thought Mr. Billstein with the limited strengths did a good job. (emphasis added).

United States Proposed Finding of Fact:

637. The State's consultant's apparently did a depletion analysis similar to that of Mr. Toedter and a natural or virgin flow analysis similar to that done by Mr. Keene. The work on behalf of the State was done by Mr. Doug Torza who did not testify. Tr. 9376. The State's depletion and virgin flow analysis were input to the computer program and technically not part of the program itself. No criticism was offered of either Mr. Toedter or Mr. Keene's results.

Wyoming's Response:

637. The citation of the Record provided is incorrect and unsupportive of the Finding. The correct cite to partially support the United States' statement is Tr. 9378-9379, where the relationship between Mr. Fassett and his staff of engineers is discussed. Mr. Fassett had complete day-to-day responsibility for all work performed by Leonard Rice Consulting Water Engineers, Inc. on behalf of the State of Wyoming (Tr. 9379 and 9541) and, as such, testified in detail regarding all aspects of his or his staff's efforts(Tr. 9541). It should be noted that both Mr. Billstein and Mr. Kersich testified that they had had significant assistance from field personnel from their office who were also not called to testify, by the United States, including but not limited to Mr. Ralph Saunders, Mr. Len Olsen and Mr. Chick Smith. In response to the last statement, for which there is no citation to the Record, the United States HEC-3 computer studies also incorporated the results of their depletion and natural flow studies which were separate hydrologic studies from the system operations study work.

United States Proposed Finding of Fact:

638. Mr. Fassett testified that, in conjunction with the depletion analysis inherent in the program, several cropping patterns were developed. There were two cropping patterns for each of the four counties in the basin, one for altitudes above 6,000 feet in elevation and one for altitudes below that elevation. Tr. 10114. The State's consultants developed a cropping pattern for each of the years in the 1970-79 period and for a "long term" average year. Tr. 10451. This results in eighty-eight different cropping patterns, since each county was assigned its distinct cropping pattern and each county was divided at the 6,000 foot level. Mr. Fassett testified that Mr. Jim Jacobs told him to divide the patterns at 6,000 feet. Tr. 10114. Mr. Bishop later testified that Mr. Jacobs told him that the correct elevation division line was 5,500 feet.

Wyoming's Response:

638. Portions of this Finding are a misinterpretation of the transcripts cited. The depletion analysis is part of the virgin (natural) flow study which is input to the Wyoming Model. There were two cropping patterns for each of the five counties in the Big Horn River basin not four counties as stated by the United States. There is no support in the Record that 88 different cropping patterns were developed. There is no citation to the Record in support of the last statement of this Finding.

United States Proposed Finding of Fact:

639. The Wyoming model was limited to a base of a ten year period, 1970-79. Tr. 9376. Mr. Charles Rehr, another witness called by the State, testified that this was too short a base period to determine hydrologic potential. Tr. 12544.

Wyoming's Response:

639. This statement is not supported by the Record. The 1970-79 study period was one of three specific hydrologic periods that were analyzed utilizing the Wyoming model (Tr. 9551, 9564, 9619). The other two were those based on long-term average hydrologic conditions reflective of a 40-60 year average and also a set of flows that were derived on a statistical basis for the dry year streamflows. There is no testimony in the Record that the State witnesses indicated the the 1970-79 period was utilized to "determine hydrologic potential," as stated by the United States. Mr. Fassett testified that this specific ten-year period was selected based on its representative numbers of above-average, below-average and average streamflow conditions as well as being a period of recent record (Tr. 9564-9565). The modeling results from the State's analysis for the 1970-79 period were used for comparison purposes to present to the Court conclusions based on varied year-to-year streamflow conditions and operations.

The United States has misstated the transcript with respect to Mr. Rehr's testimony. At Tr. 12544, Mr. Rehr was aked if the 1970-79 period is an adequate period

to determine streamflows. There was no reference to the determination of hydrologic potential as stated by the United States. Mr. Rehr also qualified his answer on Tr. 12544, admitting he was asked something that he was not qualified to answer.

United States Proposed Finding of Fact:

640. The State's consultants did not include all the outstanding State adjudicated and permitted water rights in the model's data base. Some water rights were excluded on the advice of Mr. Christopolous and others excluded by Mr. Fassett. Tr. 9544-45. Only 80 percent of the acres covered by the certificated rights were included (Tr. 9544) and only 65 percent of the permitted acres were included. Tr. 9547.

Wyoming's Response:

640. The reasons for the State consultants not including the outstanding state-awarded, certificated and permitted water rights were discussed in detail by Mr. Fassett (Tr. 9544-45). Certain permits within some reaches of streams throughout the basin were left out for modeling purposes based on the administration assumptions and the actual field conditions that were being simulated with the State's river basin operations efforts. Mr. Fassett testified that by leaving out portions of the state-awarded water rights in the uppermost areas of the watersheds that the results of his analysis would be conservative (would show less impact as a result of the United States and Tribal claims than actually occurs if all rights were included. Tr. 10039-40).

It should be noted that the United States' position with respect to Proposed Finding 640 is in direct conflict with its Proposed Finding 657. In one Finding, the United States criticizes the State for excluding some of the permitted water rights and in the other, they criticize the State for including any of the state-awarded water rights. This is a very confusing and inconsistent position.

United States Proposed Finding of Fact:

641. The State water rights that were included in the Wyoming model were not assigned a full diversion requirement. Under State law a person with a State water right can divert 1 C.F.S. per 70 acres, or about 4.3 acre feet per acre per irrigation season. Tr. 9835-36. In some cases Wyomings model the allows only 3.25 acre feet per acre of diversion (Tr. 10295), in others 2.52 acre feet (Tr. 10326-7), and in others 3.5 acre feet per acre. Tr. 9836. In some cases the State used the actual diversion records, such as at Midvale (Tr. 10319-21). Where actual records were used, the unit diversion requirements were much greater than the 3.25 acre feet per acre or the 3.5 acre feet per acre normally assigned by the State's consultants in the model.

Wyoming's Response:

641. Mr. Fassett discussed in detail the basis for the diversion schedules he utilized for his river basin modeling studies. The United States correctly indicated that under state law, the state-awarded water right can divert up to 1 cfs per 70 acres. However, state law is not a mandatory diversion requirement. Based on Mr. Fassett's research, to which he testified, he felt it was not appropriate to allow every state-awarded water right to divert 1 cfs per 70 acres throughout the full irrigation season. This kind of operation, based on the actual diversion records obtained by Mr. Fassett, would not be reflective of the way most of the water rights operate throughout the Big Horn River drainage. Consequently, Mr. Fassett developed a series of diversion schedules which reflect the water rights throughout the drainage, both within and near the Wind River Indian Reservation. In addition to consulting historic diversion records, Wyoming's consultants also utilized consumptive use studies developed by the State of Wyoming and the United States' experts as well as

personal interviews with numerous water users and the State's water commissioners located throughout Water Division 3. Diversion schedules were also developed and utilized based on various categories of water rights in the basin, again, reflective of the interviews and the research Mr. Fassett had done with respect to diversion requirements for all water rights in the Big Horn River drainage. See Wyoming's Amended Proposed Finding of Fact 27-11 and support therefor.

United States Proposed Finding of Fact:

642. The diversion requirements used in the model are strickingly smaller than those testified to at the Worland hearings where the farmers unanimously testified that they used more than 1 c.f.s. per 70 acres per year.

Wyoming's Response:

642. The United States did not include any citation to the Record in support of this Finding. The reason many individual farmers feel they divert water more than those reflective in Mr. Fassett's diversion schedules was that, based on Mr. Fassett's interviews, many farmers and users throughout the basin operate on a water sharing basis. There are many times when individual farmers will allow their neighboring users to share in their water for some short period of time (exceeding the 1 cfs per 70 acres allocation) in exchange for a return allotment during a subsequent day or week. However, the main stem diversion structure maintains a constant diversion flow with only internal diversions being divided between individual users. See Wyoming's Amended Proposed Finding of Fact 27-11 and support therefor.

United States Proposed Finding of Fact:

643. The effect of these cutbacks in the actual water use and in the outstanding State permits and certificates is to reduce the conflicts among non-Indian water. The ultimate results of the model, which allegedly show that the Indian water rights will conflict with a particular non-Indian water right, are therefore unreliable.

Wyoming's Response:

643. Again, the United States fails to provide any citation to the Record in support of this proposed Finding. It is no wonder that such a citation is not included since the statements in this Finding are the result of an amazing assumption and apparent analysis on behalf of the United States. The statements here are an outright assumption that the United States has made without support of any information in the Record. There is no information that would show what the actual water use and effects on state-awarded water rights would be should varying diversion schedules be utilized. Mr. Fassett testified that since a portion of conclusions of his modeling studies were the results of a comparison of the before and after conditions (i.e. before and after the imposition of the United States and Tribal claims) that in most cases, changes in the diversion schedules associated with the state-awarded rights would be nullified. However, even Mr. Fassett did not speculate on the conclusion reached by the United States for this particular answer, until further specific modeling work in that regard had been accomplished. There is no support in the Record or testimony by United States experts that their systems operations study could in any way model the

kinds of effects that the United States makes reference to in this Finding. (Tr. 10014-10016 and 10352-10353). See also Wyoming Amended Proposed Finding of Fact 27-11.

United States Proposed Finding of Fact:

644. While the model was purportedly "verified" to see if the result met the "real world situation" (Tr. 9565-69), on cross-examination the State of Wyoming stipulated that at no place in the basin could the model be verified for any month during the irrigation season. Tr. 10286. The State model, however, reaches conclusions on water availability on a month by month basis. Tr. 10229.

Wyoming's Response:

644. The United States again takes great liberty to take out of context and misstate the actual transcript citations in support of their Findings.

Mr. Fassett testified regarding the verification process that the State's experts went through in order to assure themselves that the Wyoming model was operating correctly. There is absolutely no testimony in the Record that the United States experts verified their systems operations work in any way. Mr. Fassett verified not only that the mathematic calculations performed by the computer were being done in accordance with the logic he developed, but also insured that the resultant streamflows and water rights conditions matched actual historic U.S.G.S. streamflow records at many locations in the basin, including the Wind River Indian Reservation. Wyoming model results were verified in many places on an annual basis and Wyoming did stipulate that the model could not necessarily be verified on a monthly basis at any selected point.

> Mr. White: Your Honor, in order to save time, I wonder if it might not be possible for the United States and the State to stipulate that the monthly values at any guage which the United States may care to identify based on the historic USGS gauge

> readings will significantly vary from month to month during the year from those shown in the model. We wouldn't be willing to do that on an annual basis, but if that's the point Mr. Clear is trying to make we can stipulate to that without harming our presentation. It might speed things up quite a bit.

The United States never named any gauge for which they felt the modeling verification process was invalid. As a matter of record, the majority of the questions utilized upon cross-examination by the United States of Mr. Fassett, were surrounding non-irrigation months where they felt the verification process had not been validated. See Wyoming's Amended Proposed Finding of Fact 27-11 and support therefor.

United States Proposed Finding of Fact:

645. The model developed results based on a statistically dry year based upon only two gauging stations in the basin. At one station, Bull Lake Creek near Lenore, the statistical dry year had less flow than the driest year in the corresponding period of record. Tr. 10173. The period of record for this gaging station is 1919-1979. Tr. 10172. The statistical dry year is, therefore not reliable.

Wyoming's Response:

645. The statistical dry year streamflow data that was utilized by the Wyoming model was presented to the Court for comparison purposes only. Mr. Fassett testified at length that the streamflows utilized for this alternative model run were developed on a statistical basis and were not reflective of any specific years U.S.G.S. records at any particular site located throughout the basin. The streamflows generated are merely a reflection of the statistical analysis of an infrequent occurring drought period and what the potential effects upon state-awarded rights and water availability might be if such an occurrence of drought conditions should reoccur. Mr. Fassett also testified that the statistical dry year analysis was applied equally basin-wide. See Wyoming's Amended Proposed Finding of Fact 27-11 and support therefor.

United States Proposed Finding of Fact:

646. The computer printouts were reported on a calender year basis, that is January through December. The virgin flow results were into the computer data base on a water year basis (September through August). As a result the computer output compares diversions for a particular month in one year with the virgin flows of the same month in the previous year. Tr. 10185-91. Since the model operates sequentially, streamflows which are out of order impacts the results of the analysis. Tr. 10189-91.

Wyoming's Response:

646. There is no support in the Record that the virgin flow results fed into the computer were done on a period from September through August. Mr. Fassett did testify that the values utilized were on a water year basis which runs from October through September. Apparently the United States does not understand the concept of water year. Mr. Fassett recognized discrepancies in his data files and later testified on redirect that by correcting the fall months' streamflows, that the results of his final conclusions did not change. In addition, Mr. Fassett testified, that in all cases his results were based on a comparison of before and after runs with and without the imposition of the United States and Tribal claims. As a result, any differences in the virgin flows would be included within both analyses and would lessen the effect of any dramatic changes. The United States also failed to point out that this water year problem only effected the 1970-79 period from which the discussion was based upon cross-examination. No discrepancies were included in the statistically dry year or the more important long-term average streamflow year, as a result of this change.

United States Proposed Finding of Fact:

647. The assumptions used by the State to depict the current level of development in the basin for the purposes of model verification is totally suspect. For the Little Wind River watershed shown on WRIR MF-14-5, the SCS 1969 study showed 34,700 acres presently irrigated. Using standard of 1 cfs per 70 acres for the State awarded water rights on WRIR MF-14-5, Mr. Fassett operated this reach of the model to serve only 5696.6 acres. Tr. 10210-12, 10215-16. Results of this operation was utilized in the verification of the model at Fassett Station No. 26. Tr. 10196, 10198.

Wyoming's Response:

647. The United States misinterprets information in the Record. Mr. Fassett never testified that his model only served 5,696.6 acres within a certain segment of the Little Wind Basin as identified in this Proposed Finding. This was a matter stated by Mr. Clear during a brief Offer of Proof made to the Court for which there was no supporting evidence. In addition, the actual transcripts cited reflect that Mr. Fassett attempted to correct the acreage comparison Mr. Clear was about to make before Mr. Clear made his Offer of Proof. The comparison of actual acres irrigated based on the 1969 SCS study to those contained in the model data base was incorrect since Mr. Clear was only considering a portion of the entire Little Wind River drainage which is tributary to U.S.G.S. gauge No. 24 as opposed to the model verification station gauge 26 which is located downstream. This verification station includes significantly larger irrigated areas in other stream basins for which a verification was appropriate. The acreage comparison made by the United States in its Offer of Proof is not valid and is not supported in the Record. Verification station No. 26 is located at the mouth of the Little Wind River which includes not only acreages and water rights shown on Wyo. Exh. MF-14-5

utilized by the United States but also other of the MF-14 series of maps which would include the Middle Popo Agie, the North Fork of the Popo Agie and the Little Popo Agie River watersheds which are all tributary to the main stem Little Wind River upstream of verification station No. 26 as was discussed upon cross-examination. See also Wyoming's Amended Proposed Finding of Fact 27-11 and support therefor.

United States Proposed Finding of Fact:

648. Mr. Fassett testified that his model was run under strict administration. He admitted that this was not the current situation in the basin. Yet the strict administration assumption was used in model verification assessments. This casts doubt on the results. Tr. 10225.

Wyoming's Response:

648. Mr. Fassett testified that he operated the Wyoming model under a series of administrative assumptions that were provided and developed over a period of time under the guidance of Mr. Christopulos, the Wyoming State Engineer (Tr. 9702-9705). Both Fassett and Mr. Christopulos admitted that historically the streams located in the Big Horn River drainage have not operated under what is termed "strict administration." (Tr. 10225). However, Mr. Christopulos and Mr. Fassett both pointed out that, after imposition of the magnitude of water claims set forth by the United States and the Tribes, in many, many areas strict administration will come about where there now exists very little water rights administration (Tr. 10225). The model operates under administrative rules set forth and based on Wyoming state law and administration rules and practices utilized in Water Division No. 3 under Mr. Christopulos' administration. None of the specific rules testified to by Mr. Christopulos and utilized by Mr. Fassett were criticized by the United States or Tribal experts or counsel. See also Wyoming's Amended proposed Finding of Fact 27-11 and support therefor.

The United States continues to criticize Wyoming's model based on its lack of verification when the United States' experts readily admitted that no verification process was undertaken for their systems operations studies. Their studies were so simplistic and unrealistic with respect to the water administration rules and laws as effective in the State of Wyoming under the prior appropriation doctrine as utilized in the West that it was impossible to do any "real world" verification process. The United States experts did not even verify the mathematical processes that their computer model was utilizing even though it was an off-the-shelf package program that they had modified to include some additional refinements. See Wyoming's Finding of Fact 27-8 and support therefor.

United States Proposed Finding of Fact:

649. Releases at Boysen Reservoir further illustrate the major difference between the 'real world' situation and the Fassett Model. Tr. 10247-48, 10253-54, 10263. This is confirmed by comparing the Fassett Model flows below Boysen with official U.S.G.S. records. Tr. 10285.

Wyoming's Response:

649. This Finding includes another misstatement and improper citation to the Record. Tr. 10285 does not include any discussion with respect to comparing the Fassett model results to the U.S.G.S. records, but only includes a listing of the U.S.G.S. records utilized. Mr. Fassett testified to the difference in the particular monthly flows that the United States is criticizing with respect to the verification process. Mr. Fassett testified that he utilized the administration rules set up by the State Engineer's office which did not account for any desired operating criteria that had been previously set up by the Bureau of Reclamation. There are no requirements based upon state or federal law to meet those requirements. See also Wyoming's Amended Proposed Finding of Fact 27-11 and support therefor.

United States Proposed Finding of Fact:

650. Mr. Fassett did not include the North Fork Chute in his operational analysis of the Little Wind River Basin. He admitted that he knows the facility was used but omitted it because it had no state water right. Yet his model purports to show the "real world" situation. Tr. 10313.

Wyoming's Response:

650. The United States, in its proposed Finding, again limits itself to a small portion of the transcripts and takes the discussion out of context. Tr. 10314 should also be included which discusses Mr. Fassett's testimony concerning the reasons why certain facilities were omitted from his modeling work.

United States Proposed Finding of Fact:

651. Fassett Diversion schedules rather than actual BIA administered FIP records were used relative to lands served within the Wind River Federal Irrigation Project. Tr. 10315-16.

Wyoming's Response:

651. The transcript citation to the Record is again in error. No discussion of the diversion schedules utilized are noted on these pages. The transcript only discusses the relative administrative assumptions that were being utilized.

United States Proposed Finding of Fact:

652. There were many differences between historic diversion records for selected canals within the basin and Mr. Fassett's diversion schedule. Tr. 10329-63.

Wyoming's Response:

652. This Finding also misstates the transcript cited, in that it implies that many differences between historic diversion records and those utilized by the Fassett diversion schedule were discussed. Upon a review of the Record, only two specific canals of the some 3,000 to 4,000 that were actually analyzed by the Wyoming model were questioned unsuccessfully under cross-examination. The Record reflects that Mr. Fassett was unfamiliar with the records that were being utilized for comparing gaged records against his developed diversion schedules. The records used to cross-examine Mr. Fassett were of the entire ditch system and may not have been reflective of the amount of water diverted solely under the water rights associated with each facility. The total diversions associated with any canal could also include water diverted under high water flood rights, based on the 1945 State of Wyoming law, in addition to storage waters that could be rediverted and passed through the canal system, in addition to those diversions actually made on a direct flow basis from the available streamflows.

United States Proposed Finding of Fact:

653. The actual computer program was developed and written by Mr. Paul Musser, who did not testify. Tr. 9470. Mr. Musser developed the logic flow diagram for the program. Tr. 9471. Neither Mr. Rice nor Mr. Fassett can read the computer program or explain the logic diagram. Tr. 9474, 10088. Miss Carla Worly was apparently responsible for running the computer and see that it was properly operated. Tr. 9378-79. She was not called as a witness.

Wyoming's Response:

653. Finding 653 presented by the United States is again a misquote of the Record cited. It was clearly testified to by Mr. Fassett and Mr. Rice that the actual computer program was written by Mr. Paul Musser (Tr. 10029-10030). The logic was not developed by him, but by Mr. Rice and Mr. Fassett. Mr. Musser developed and prepared the logic flow diagrams after the actual program and logic was put together. It could not be clearer that Mr. Fassett and Mr. Rice developed the logic for the model and that Mr. Musser just developed the logic diagram (Tr. 10029-10030). Mr. Musser had absolutely nothing to do with developing the actual river basin water rights operation logic that went into the Wyoming model. Mr. Musser merely transferred the ideas and logic results desired by Mr. Rice and Mr. Fassett into the appropriate computer FORTRAN programming steps that would be required by the computer to exercise and accomplish the desired task.

Although Mr. Rice was unable to discuss in detail the logic diagrams, on transcript pages 9475 through 9480, he discusses generally the entire set of diagrams that were utilized on cross-examination. Mr. Fassett testified that although he did not prepare the logic diagrams, he

could describe in detail any portions of them the United States wished to discuss (Tr. 10088). The United States never questioned Mr. Fassett on cross-examination with regard to specific questions regarding the logic diagrams, yet continues to state that Mr. Fassett did not understand or explain the logic diagrams. Mr. Fassett testified on cross-examination that, during his deposition, he described many of the logic diagram blocks in detail to counsel for the United States and its experts (Tr. 10088).

The relationship between Mr. Fassett and his staff of engineers throughout the entire development of the model is discussed in detail on transcript pages 9379 and 9541. Mr. Fassett had overall day-to-day responsibility for all operations and was able to address any specific questions regarding the model's operation. At no time was Mr. Fassett unable to answer any question with respect to the model's operation or the logic used therein. The United States misquotes the Record, since it was testified to that Miss Carla Worley had responsibility and expertise of running the model, but no mention of her responsibility with respect to the results is found in the transcripts. This responsibility was Mr. Fassett's. See also Wyoming's Amended Proposed Finding of Fact 27-11 and support therefor.

United States Proposed Finding of Fact:

654. Mr. Fassett testified that he had developed the logic program for the computer. He had never done this before. Tr. 10082-83. The computer program used by the State in this case has never been used before and is not "time-tested". Tr. 9473.

Wyoming's Response:

654. This proposed Finding also slightly misquotes statements from the record. Mr. Fassett testified that he had not developed logic that went necessarily to a computerization process as was done for the Wyoming project. He testified that he had done work developing river basin operation studies, but that in all cases, these projects involved only hand-calculations similar to the manipulations that were being done by the computerized version of the river basin operation studies prepared and utilized in the Big Horn River drainage. In addition, the transcript cite, p. 9473, does not include any discussion with respect to the timed-testing aspects of the Wyoming model.

United States Proposed Finding of Fact:

655. On cross-examination Mr. Fassett admitted that Dinwoody Canal, which carries about 30-40,000 acre feet of water was omitted from his virgin flow analysis at Gauge No. 2 on the Wind River. This resulted in an underestimation of natural flow on the Wind River with the corresponding result that more state rights would be called out of priority. Tr. 10148-57. Mr. Fassett reworked his model and, on redirect, testified that he had now included the virgin flows for Dinwoody Creek. Tr. 10454-58. Mr. Fassett testified that, as a result, more State water rights would be called out by the United States claim. Tr. 10458. This is an incredible result since an increase in virgin flow increases supply, not diversion.

Wyoming's Response:

655. Mr. Fassett never testified that the Dinwoody Canal carries about 30-40,000 acre feet of water a year. This statement was made by Mr. Clear during his cross-examination of Mr. Fassett. The second statement made in this Finding also excludes additional pages from the transcript that would clarify the situation. The pages that should be included are 10158 through 10160. Mr. Fassett did not testify that he had to rework his model but only had to rerun those portions of the simulation to correct his oversights with respect to the virgin flow analysis on the main stem Wind River. No change in the virgin flow for Dinwoody Creek as stated by the United States was required.

Mr. Fassett testified at the time that the discrepancy was brought to his attention that he did not feel, due to the magnitude of the streamflows and water rights involved, that there would be significant changes in the results he had testified to. Mr. Fassett testified that the results upon the affected list of state-awarded water rights would not be significant, based on the adjustments in virgin flows. Mr. Fassett testified on re-direct examination that he reran the model to confirm his earlier contention, with results supporting this

statement. Adjustments resulting from the new runs were less than a 1% to 2% change in the overall acreage identified by Mr. Fassett as being affected as a result of the United States and Tribal claims.

United States Proposed Finding of Fact:

656. The operational studies should not have been conducted with both the Tribe and United States claims lumped together. Each claim should have been individually analyzed. Tr. 10368, 10370.

Wyoming's Response:

656. The State of Wyoming feels it is totally appropriate for Mr. Fassett to have operated and conducted portions of this operation studies with both the Tribal and United States claims on behalf of the Tribes combined together. The pleadings set forth in this case clearly indicate that the claims made by the Tribes themselves are in addition to those submitted by the United States on their behalf. Since the Tribes themselves are adding additional claims to those submitted by the United States, it is appropriate for the Count to look at the entire picture of claims that are being presented in this adjudication for the Wind River Indian Reservation. Mr. Fassett's model has the flexibility to analyze any combination of claims, locations, return flows or priority dates the Count may wish to assign in order to analyze appropriate results therefrom. However, during the first portion of Mr. Fassett's testimony in September of 1981, it was appropriate for the State of Wyoming to present evidence to the Court indicating the water availability and impact problems associated with granting the total magnitude of claims as submitted and testified to by experts for the United States and Tribes.

It would be totally inappropriate to analyze these claims on an individual basis without looking closely at the complex interaction of the diversion, storage impoundments, instream flows and return flows resulting from this magnitude of claims. Without an analysis of water availability combining all the claims together, the Court is left without any basis for determining whether or not water would be available to any portions of the claims under varying hydrologic conditions.

United States Proposed Finding of Fact:

657. The computer program had to assume that some of the outstanding State certificates or State permits allowing water diversions would ultimately be validated in these proceedings. Mr. Christopolous, the State Engineer, testified that he had supplied Mr. Fassett with a list of "valid" certificates and permits, but that the Court should not and could not rely on that list for its determination of the validity of the State permits and certificates. The data base used by Mr. Fassett is therefore legally incompetent evidence.

Wyoming's Response:

657. This proposed Finding is not supported by the Record. It is clear the reason a citation was not provided is because one could never be found for such a statement. The initial statement by the United States indicates that the computer program had to assume that some of the outstanding state certificates or state permits allowing water diversions would ultimately be validated by these proceedings. The computer program does not assume anything. The computer program is a list of computer FORTRAN programming steps which carry out a series of mathematical calculations based on river basin operations logic under the prior appropriation doctrine as developed by Mr. Rice and Mr. Fassett. The computer is not an independent thinking machine. The State of Wyoming's experts included numerous state certificates and valid state permits as determined by Mr. Christopulas, the Wyoming State Engineer, to be modeled in the entire river asin operation study. It is appropriate to utilize these water rights as a basis to analyze the complex interaction of the current state-awarded rights in relation to the proposed claims set forth by the United States and Tribes. Furthermore, the United States states that Mr. Fassett was supplied with a list of valid certificates and

permits. This is not the case. Mr. Fassett's testimony indicated that he was provided with a list of valid permits only and that all certificates from record were considered valid. Mr. Fassett and Mr. Rice both testified that a determination of validity based on the records maintained by the State Engineer's Office is a source of information that would be relied on by experts in water resource engineering for undertaking studies of this type.