

Preliminary Draft
Subject to Revision

MINUTES OF THE
BEAR RIVER COMMISSION
ANNUAL MEETING

April 21, 1986
11:00 a.m.

P41
New State Assessments

P7 GAGING STA. PROGRAM

Corrections
P 26

First Floor Auditorium
Department of Natural Resources Building
1636 West North Temple
Salt Lake City, Utah

THOSE PRESENT

UNITED STATES

Kenneth T. Wright, Chairman
and Federal Representative

WYOMING COMMISSIONERS

George L. Christopoulos
J. W. Myers
S. Reed Dayton
John Teichert (Alternate)

IDAHO COMMISSIONERS

Daniel Roberts
Don W. Gilbert
Rodney Wallentine
Kenneth Dunn, Ex-officio Director
Idaho Dept. of Water Resources

UTAH COMMISSIONERS

D. Larry Anderson
Blair R. Francis
Paul Holmgren
Calvin Funk, (Alternate)
Dean Stuart, (Alternate)

LEGAL COUNSEL

E. J. Skeen

ENGINEER-MANAGER

Wallace N. Jibson

SECRETARY

Nancy Fullmer

OTHERS IN ATTENDANCE

UTAH

Robert L. Morgan, State Engineer
Dr. Norman E. Stauffer, Division of Water Resources
Barry Saunders, Division of Water Resources
Lloyd Austin, Division of Water Resources
Geralee Murdock, Division of Water Resources
Robert M. Fotheringham, Division of Water Rights
Jim Christensen, Utah Department of Agriculture
Carly Burton, Utah Power & Light Company
Jody Williams, Utah Power & Light Company
Robert W. Hill, Utah State University
L. Niel Allen, Utah State University
Rick Allen, Utah State University
Ted Arnow, U.S. Geological Survey
Walter R. Scott

IDAHO

Hal N. Anderson, Idaho Department of Water Resources
Charles Brockway, University of Idaho

WYOMING

John Shields, State Engineer's Office
Jeff Fassett, Deputy State Engineer
Mike Ebsen, Hydrographer
Marvin Bollschweiler

Minutes of
BEAR RIVER COMMISSION
ANNUAL MEETING
April 21, 1986

KEN WRIGHT: Let's call this meeting to order. Wally will read the summary of the minutes.

WALLY JIBSON: You may have noticed on the November meeting it was inadvertently marked Annual Meeting. It should have been Regular Meeting. A summary of the November, 25, 1985 Regular Meeting minutes ^{was} were read. Chairman Wright asked for a Motion on the Minutes. Reed Dayton made the Motion the Minutes be approved as read. Rodney Wallentine seconded the Motion.

REPORT OF CHAIRMAN

KEN WRIGHT: I really have very little to say as far as the Report of the Chairman, except Chicago is probably facing the same problems as Great Salt Lake is. We have no beaches left in Chicago. There are a lot of people who probably will be traveling west.

I just wanted to say one thing as we get into these subjects the Bear River has its responsibilities outlined and specified in the Compact, and we should meet those responsibilities. At the same time we also have the responsibility to hold down costs where we possibly can without interrupting the work or the responsibilities of the Bear River. As we discuss these subjects on the Agenda for this morning, I think we ought to keep in mind there's an additional responsibility of trying to get the cost of government down. The Bear River is a small part of that. When you add up all the commissions and all the societies, etc. who work throughout the United States it adds up pretty quickly. I just wanted to get that in the minutes and into the record.

REPORT OF TREASURER

LARRY ANDERSON: I've asked Bert Page if he would make this report today.

BERT PAGE: This report is the financial report of the Bear River Commission as of March 31, 1986. In it you will notice we had a balance brought forward of \$98,775.62. We've earned interest income from our investment with the Utah State Treasurer of \$8,469.86. Each of the three states have paid their assessment of \$42,000, which gives us a total income to work with, as of this date, of \$233,245.48.

Expenditures to date, we've paid \$62,240.00 to the U.S. Geological Survey for stream gaging program; personal services \$2,908.77; \$250.00 for office supplies etc; \$195.00 for printing and reproduction of the Annual Report. For our legal consultant we've paid \$500.00, and our contract with Utah State University we have paid nothing yet. There's a check outstanding but it's since the first of the month. The total expenditures as of this date are \$68,093.97, or a cash balance still remaining of \$165,151.51.

On the reverse side is the list of expenditures that's taken place. The bank reconciliation at the bottom is the same figure - \$165,151.51. This is the report. Are there any questions?

CHAIRMAN WRIGHT: What's the projection at the end of the fiscal year, June 30? What do we think we will spend?

BERT PAGE: We'll probably spend more for Wally (Engineer-Manager) but not the entire \$8600. I think probably \$4,000. Is that right Wally?

WALLY JIBSON: Maybe \$5,000. There will probably be about \$3600 left over.

BERT PAGE: I don't foresee any expenditures in travel right now - office supplies could go to \$300.00.

WALLY JIBSON: Bert there's just a question here on travel. That travel item in the budget is actually my travel, and you'd have to break out each voucher I gave you to show you did spend some out of that \$400.

BERT PAGE: We picked it up with Personal Services, maybe we shouldn't have that in the future, just the one contract.

Treasurer's bond and audit I suspect will come close to about \$560.00. I think we'll overrun that a little bit. The printing is as it

will be there, I think. Our legal consultant - Ed works pretty good for us. A year ago he went \$8.00 over the \$500, so I think we can probably stay pretty close to that. Utah State University, I think we'll probably pay the full amount out there - the proposed \$36,000. We will probably have around \$125,000 at the end of the fiscal year.

DAN ROBERTS: What's going to happen to your interest income?

BERT PAGE: I suspect with the rates going down the interest is going down. I know we're getting the best interest we can because the State Treasurer lumps it and makes \$100,000 investments, which we can't do.

WALLY JIBSON: We pay the Utah State University on three different payments - one after January 1, one after March 31, and one at the end of June. You haven't written a check for the January 1, yet?

BERT PAGE: I have. It's outstanding right now, but it came after this date.

WALLY JIBSON: My point is the entire \$36,000 will be obligated.

BERT PAGE: Yes.

CHAIRMAN WRIGHT: We're projecting by the end of June 30, we should have \$125,000 in our budget.

BERT PAGE: We're working up some other projections that Larry will talk about later.

GEORGE CHRISTOPULOS: I move we approve the financial report as prepared.

PAUL HOLMGREN: I second it.

KEN WRIGHT: All in favor, any opposed?

MOTION CARRIED.

REPORT OF ENGINEER-MANAGER

WALLY JIBSON: This is the usual type report. A copy is attached.

LARRY ANDERSON: After we're finished today I'd like to come back and talk about the budget. I think we should go on with the reports of the committees first.

REPORT OF COMMITTEES

Reduction in Number of Commission Funded Gaging Stations

BOB MORGAN: The Engineering Committee has met again to discuss these stations, and has come up with some recommendations. On the sheet passed out to the Commissioners there are two lists - the bottom sheet are those stations and those recommendations of the Engineering Committee as of November, 1985. The top sheet would be those recommendations of the Engineering Committee as of April, 1986 (copy attached). We've met with both State Engineers and Larry to discuss these and make the following recommendations. Those sites directly needed stay the same with one exception, the Chapman Canal gage was removed from a site directly needed and placed in a site not to be funded by the Commission, and the operation of that gage will be negotiated between Wyoming and Utah. We added to the sites directly needed - Bear River below Smiths Fork. Those sites directly needed total 13 stations - 9 of those funded by the Commission, the other 4 are funded by Utah Power and Light.

The second listing is those sites indirectly needed. It stayed essentially the same as the previous list passed out totalling 15 stations, 8 to be funded by the Commission, the remainder to be funded by Utah Power and Light. Those sites not needed or not to be funded total 15. We are making the recommendations that 17 sites be funded by the Commission and 15 be eliminated.

CHAIRMAN WRIGHT: The 4 and 7 funded by Utah Power and Light, have they previously been funded by the Bear River Commission?

BOB MORGAN: No, they've always been funded by Utah Power & Light.

CARLY BURTON: I'd like to add something if I may on behalf of Utah Power & Light. We've also been looking at our stream gaging program on the Bear River. There are some stations we're looking at right now we may want to reconsider eliminating as well. We'll need to have some discussions and negotiate with some different agencies before we do that, but I'd just like you to know some stations we're considering for either reduction or elimination include Bear River at Harer. We have a record called the Dingle Inlet Canal. We're looking at that one as

well. That's one of the small canals built to bring water in from the Bear River. We're looking at Bear River above Soda Springs and we also make measurements on the Soda Reservoir tributaries. We're looking at eliminating those. The areas we need to look at closer - Bear River at Harer, - a forecasting station of the Soil Conservation Service and the National Weather Service and we need to talk with those people to see how important that station is for forecasting.

As far as Utah Power & Light is concerned we have developed a Bear River runoff model for basically Bear River at Stewart Dam which would include the Rainbow Canal plus Bear River below Stewart, in other words, bringing the available water at Stewart Dam back. While the forecasts of the Bear River at Harer are useful to us, we always have to adjust those figures because of irrigation diversions and a period of the runoff forecast is April to September. We always have to adjust that back to April through July period because August and September are not very helpful to us as we've already peaked at Bear Lake and we already know what our plans are going to be for the upcoming year. We're looking at that station. We need to talk with the SCS and National Weather Service as well as Ted's people at the USGS.

Bear River at Soda Springs, right now we're experimenting with a computed inflow at Soda Reservoir. We measure the flow above Soda Reservoir and we measure the tributaries and we also measure the flow just below Soda Reservoir. To me, it's because, even though we've been doing it for 50 years or whatever period it is, we think we may be able to get just as good a record by using some computer inflow calculation capability with some of the computer facilities we have. Again, we need to discuss this station with the appropriate agencies.

WALLY JIBSON: On the measurement at Soda you need that under the Dietrich Decree don't you? - either direct measurements or whatever you generate. You do have to have that record.

CARLY BURTON: We are looking at the physical layout of the river and the measurements and the records we do keep. That may be reason enough for keeping that station. We're looking right now.

WALLY JIBSON: I wasn't thinking so much of the Bear River above Soda as I was the inflow at the Alexander Reservoir that is measured. As I recall the Decree calls for that.

CARLY BURTON: That may be reason enough to keep those. We're looking right now. We're making some comparisons between measured flow at Soda and the Soda tributaries and comparing with the calculated inflow at Soda Reservoir just to see if that will really work. We're looking as well to reduce the number of stations. That doesn't mean we will at this time, but we're looking.

CHAIRMAN WRIGHT: What's the timetable?

CARLY BURTON: We're going to continue these stations through this year and keep running some comparative figures, and of course, meeting with the appropriate agencies we will probably make the decision after or maybe shortly before the end of this water year - September. We would know by the November meeting.

CHAIRMAN WRIGHT: The word indirectly got us all discombobulated at the last meeting and does the definition of that word mean these stations are not necessary to meet the requirements of the Bear River Compact?

BOB MORGAN: That's correct, but they are used in forecasting and modeling for determining the total supply in the system.

CHAIRMAN WRIGHT: Would Utah Power and Light in their evaluating of the existing measurement stations consider taking on any of these?

CARLY BURTON: No, as far as our operation is concerned we wouldn't see a need.

WALLY JIBSON: Bear River at Harrer is in that group, but as you said the only purpose there is forecast, as far as the Commission is concerned we don't need it.

BOB MORGAN: If it was essential for a particular state, it would be the obligation of that state to pick it up.

CHAIRMAN WRIGHT: Are there any questions on this proposal?

LARRY ANDERSON: Based on our long discussion last time we met, I move we accept this recommendation and approve the continued funding of these 17 gages this coming fiscal year and keep the 15 that have been dropped until the end of this water year. Anyone desiring to pick up any of the gages being dropped will have until September to make that decision.

DAN ROBERTS: I second the Motion.

CHAIRMAN WRIGHT: All in favor, opposed?

GEORGE CHRISTOPULOS: Ken, one comment on that. Maybe I should mention on West Fork Bear River below Whitney, I think the State of Wyoming will go ahead and operate that. We'll have to work something out on equipment. It is listed under sites not funded by the Commission. It will be dropped as a Commission station. We'll pick it up and operate it seasonally.

CHAIRMAN WRIGHT: George, may I ask you, would this be an ongoing thing where we review this every year or how often does it come up, Wally?

WALLY JIBSON: We review the need for the gages every three or four years.

CHAIRMAN WRIGHT: Should it be an ongoing thing?

WALLY JIBSON: It should be decided according to the year. If we have some problems come up in any particular year, it should be reviewed, otherwise every few years ought to suffice.

I'd like to make a statement here before we go on to the next subject. By moving the Chapman Canal down to the sites not funded we end up with 17 stations. My budget is for 18. We will need to change the budget there.

Report on Proposed Consumptive Use Study to Determine 1976 Depletions

BOB FOTHERINGHAM: At the last Commission meeting there was a Motion made and we basically tried to follow the Motion and come up with the

information the Commission asked us for. On the cover letter you will note it says "attached you will find: 1. A summary of the standards and water use classifications that the committee would propose the Commission adopt as guides for development of a final report. 2. A flow chart depicting a summary of tasks that will be performed by the individual states or a conglomerate of the states along with a time chart depicting the probable schedule required to complete each task, and 3. the budget." I believe those were the 3 things you asked us to evaluate and prepare a report for.

On page 1, the committee went through and reviewed all the data generated by previous study committees. We found, as a committee, those previous committees had been very thorough. All we basically did was try to take the information they gathered in the past and present it to you in a form that could be used with this geographic information systems approach. That's about all we have done to update it. We've indicated as under (I A.) that we have a 1:100,000 scale map as a base map, we delete the basin boundaries by each state, there's a review of the boundaries by states. The type course study done previously, and about that year would be a good basis to review and make sure we agreed with the boundaries. The finished map product would differentiate by polygons or symbols different uses and would show the Bear River Compact boundaries to the irrigated acreage prior to January 1, 1976, 3 service areas for public water systems or wetland areas by privately supplied uses greater than or equal to 0.1 cfs, 6 reservoir storage sites greater than 20 acre feet, basically complying with the Compact.

On page 2 there's a category of tabular data output. We would recommend there be tabular data output in this format under these four categories only. These 4 categories would include all uses, 1. irrigated agriculture which would include a total acreage, 2. public supplies, and those are all perfected rights, past 1976 for which written information or samples must by law, be submitted to public health authorities. That way we'll use their information as the data input to gain the part of the information we need. They will include commercial, domestic, industrial,

mining, fossil fuel, geothermal, nuclear and municipal supplies. Anything that basically is supplied to someone and they would have to pay money to get the water. They do not go drill their own well. They do not develop their own source. Under private supplies we have appropriations greater than a tenth of a cfs for these same uses, only it would indicate if you had an industrial use he would go drill his own well or go appropriate his own surface water for that use, and he would be classified by a private supplier. All storage greater than 20 acre-feet including sewage treatment, irrigation and power generation reservoirs. Once we have these all categorized into these basic depletion categories then we would be able to output all that information by county, Bear River Compact, defined divisions and sections, and by township range and sections.

We then went through and tried to determine whether or not we ought to acquire more than just the 1980 data. We had Idaho perform a task for us and look at what kind of changes they saw occur between the project they had done previously using GIS and aerial photography and whatever. They found there was only about a 1% change, which was not significant, and plus we felt on a case by case basis we could take those kind of random errors out, and then come up with a good base map.

On the next page are tasks that will have to be performed by states and by all states together. Task 1 would be review existing maps and reports for Bear River Basin. Task 2 would be acquire all necessary satellite data, aerial photography, etc. Task 3 is to produce computer readable files. Task 4 is to develop Landsat irrigated lands classification. That's basically done in Idaho because they are basically in the lead. They have already generated some geographic information, and they have information that needs to be taken across state lines into the other states and the same done in those states so you will have a map as a finished product that will match on boundaries and be alike in each state. We overlay all computer readable maps that we generate. This is a study of Milford, Utah we'd like you to look at. This is a map of Utah Division of Water Rights information. We went through and digitized all the information we had to show where people could irrigate lands in the Milford valley. This is one overlay that

went into the system. This map basically shows the lands irrigated that had no water right and the lands not irrigated that had a water right and then the places not colored green or red are lands that had water rights and were irrigated. You can see from the way these are output how you can by sight, readily pick up places where they shouldn't be irrigating and places where they should be irrigating and places where they are.

LARRY ANDERSON: Would your base map look like this one? It would show irrigated lands as of 1976, and then you will produce other maps showing what has been added to it and would be used in the depletions.

BOB FOTHERINGHAM: Are there any questions on the map product?

GEORGE CHRISTOPULOS: What scale are these? Are the originals done at 7-1/2 or what?

BOB FOTHERINGHAM: They use a 7 1/2 minute quad to input the data. This is 1:62,000 so a 1:100,000 would be just a little bit smaller section than you see on these maps. This area designates township sections 1-36. Once the data is compiled we can print it out whatever size the Commission wants. We are recommending you put it on 1:100,000.

1:24,000

The cost of travel would basically be for each state. The lead state of Idaho is taking charge of the classification and if we need to travel there then Utah would use the travel money. When Utah is generating the output Idaho would need to come down and have their input in that. Also, the same with Wyoming. Data processing is just that. Once you have the information it takes time to go through the process.

CHAIRMAN WRIGHT: The total cost would be \$92,000. The Bear River pays for this?

GEORGE CHRISTOPULOS: The states pay for it by virtue of contributing to the Bear River Commission, isn't that right?

BOB FOTHERINGHAM: That's right.

GEORGE CHRISTOPULOS: The important thing to me is the costs are higher in Utah and Idaho than they are in Wyoming if we do this job. They have more acres in these states than Wyoming does. Yet we are contributing equally.

BOB FOTHERINGHAM: Any other questions?

GEORGE CHRISTOPULOS: I know it's all in your report here, but what would each of the states be expected to do?

BOB FOTHERINGHAM: It would be included in these tasks. Each state would acquire the necessary satellite data. Task 1 and Task 2 would be done by each state. Task 3 would be done by all states. Task 4 would be basically Idaho leading, but all states would be involved. Task 5 would be Idaho and Utah leading and Wyoming should be included there as they would be involved.

HAL ANDERSON: We have a very detailed flow chart. Basically these tasks are generalized as to the six major things that need to be done. On the detailed flow chart there are individual state assignments as to specific jobs, what needs to be done. This is based on the current operating capabilities within each of the states for this type. I'm sure even though this is just a task outline, as we progress on this there has to be some flexibility associated with this entire effort. As people get a little more familiar with it, get a little bit farther down the road as far as requiring equipment or additional manpower some of these might change. The estimates we made were based on current configurations of computer systems and people within the states and the amount of information and the quality of the information necessary to get it done. Even though it says on these - Idaho lead, Utah lead, for the development of the irrigated acres in Task #4, both Utah and Wyoming will be coming to Idaho to work on this particular activity, at some point in time. We all need to sit down and establish what we're calling irrigated and what we're not calling irrigated and do it in a central place so when we are done with it we all agree, indeed this is an accurate representation of the irrigated lands in each of the three states. This assumes, also,

that the Technical Advisory Committee, this group who put this together, becomes the designated group to insure the work gets done and is done in a form everybody's agreeable to.

BOB FOTHERINGHAM: Hal Anderson did prepare this chart for the committee. He did it in a lot more detail than this. We felt this would suffice for the Commission to understand the process. The outputting would be Utah as the lead state as we have the capability to produce this type of map whereas the other states presently don't. That could change. That's why we put Utah as a lead state on that.

GEORGE CHRISTOPULOS: On your map here, what's the significance of these lands that are irrigated lands without a water right?

BOB FOTHERINGHAM: Those are lands the study was done to try and identify. Some people tend to over-irrigate lands when they go to sprinkler irrigation. They can utilize their water in a better fashion than they used to. They tend to creep out of the bounds they have applications and approved rights for. That was to help us get a feel for how much over-irrigation was being done in that area.

BOB MORGAN: Sooner or later we have to go down and sit down with these people in this particular area and say okay if you are in the red either one, you are in violation of the law and should file a change application, or you are pumping more water than you should. It's an area heavily dependent upon groundwater and we know groundwater is being depleted. When we get that map it's mainly a policing action. We've asked them to cooperate in years past, so now it's a question of getting injunctions and going in there and shutting them down.

GEORGE CHRISTOPULOS: Your base map really is your water right map.

BOB MORGAN: That enables you to see the areas we picked up from Landsat that do not have a water right. If they are transferring water from areas that have water rights, but are not presently being irrigated to these other areas, we do not know.

GEORGE CHRISTOPULOS: How much field checking are we contemplating in what we're talking about here?

BOB FOTHERINGHAM: We talked about it. It depends upon the kind of output we get as we do the classification and as we start to get output. If things look like they are 100% correct then we don't do much, but if you look at the data you have as compared to what's actually on the ground you have a lot of difference. There will be more of that involved. We would expect some no matter how good it turns out. That would be, again, on a case-by-case basis.

WES MYERS: Is this basically flood irrigation or sprinkler irrigation?

BOB FOTHERINGHAM: It used to be flood, now it's both. That's one of the reasons, I'm sure, you have the overages. You used to always flood. They used to all pump into a pond and irrigate out of the pond. Now they all pump out of a system and don't have a pond and they tend to enlarge.

BOB MORGAN: If you look at that aerial photo from which that data was taken, a lot of those diagonal areas are quarter circles.

WES MYERS: Where there's flood irrigating there's naturally underground water. Where it goes there's a formation underground. There's a lot of places that's put on adequate water there and wherever it tends to go is going to get watered. It's terribly expensive to stop.

CHAIRMAN WRIGHT: Could you list for us, the benefits of this study?

BOB FOTHERINGHAM: Well there's an obvious policing effort between states. That's one of the reasons, not necessarily for the Compact, Idaho is interested in what Utah uses and Wyoming is too. In essence it polices how much depletion we had since 1976, which the Compact says we have to do. That's why Bob's working on his consumptive uses to see how much is depleted in anyone year in Montpelier versus up on Hilliard Flats versus in Box Elder County, and so those different consumptive uses would be added to the red areas and then you would calculate the total depletion since 1976, so what it is is a checks and balances where the Commission can determine what is actually being used of the additional allocation.

GEORGE CHRISTOPULOS: Basically the purpose of this is to comply with the Compact.

BOB FOTHERINGHAM: I don't think you should do this just to comply. I think it's what you wanted.

WALLY JIBSON: That's why the Commission is paying for it. Because it's necessary to administer.

BOB FOTHERINGHAM: You need to know how much water Utah is taking of its compact amount.

HAL ANDERSON: You are going to end up with several different products. You are going to end up with a base map that's true. That base map could look like what Bob has outlined there or it could easily be the other one with the red boundaries on it. It depends on when we get into it. It's not that much more trouble to produce one or the other. The information is all going to be there.

The other thing you are going to end up with is a computer readable file, just a tabular data file manipulated by the computer that also represents what is on that base map. It's a tabular information monitoring effort also. We have basically two products. The most important thing is it's a standard between the three states. All the three states can utilize it and all the three states contribute to it, so the update procedures then can be done by each of the other states submitted into the hopper and will all be matching.

WALLY JIBSON: Is there action for the Commission today on this?

BOB FOTHERINGHAM: I think any action would be as to whether or not you fund it and if you fund it now or when you are going to fund it. I think it's been studied from one end to the other by different committees. I think you need to decide whether or not you are going to fund it. I don't know how you would fund it.

LARRY ANDERSON: Mr. Chairman, it's my understanding that this is a requirement of the amended Bear River Compact. We must do this. Just how quick we want to do it, I'm not certain. One reason for raising the assessment from \$29,000 to \$42,000 a year was to comply with the compact requirement. It would seem to me to be appropriate to move ahead with this.

This was the committee's report. They've worked with this for a year to come back with these numbers based on our recommendation to them last time. Therefore, I would make a Motion we move ahead with this study, put it into our coming year's budget and move this ahead as quickly as possible to get the final answer.

GEORGE CHRISTOPULOS: I'll second that for the purpose of discussion as I have many questions to ask. First, from the standpoint of funding if we were to fund another year's study for the consumptive use study it is entirely affected on this isn't it?

WALLY JIBSON: I was going to ask Bob where they show '86 beginning in May, you're starting next month, but by and large this is our '87 budget which we will be approving today. In my tentative budget I have included one more year study by Utah State University.

BOB FOTHERINGHAM: It will only come off the base map. We're not calculating depletions from the red and green. We have the base map which will show by polygons what areas are irrigated and have a water right prior to '76.

WALLY JIBSON: The thing we need to know, Bob, is how much budget you need through the '87 fiscal year according to your timeline.

HAL ANDERSON: Whenever you start to study, and how many months you have remaining in that fiscal year just take that proportional.

CHAIRMAN WRIGHT: It looks like a 50/40 break. If there was \$50,000 in fiscal '87 and we did extend the Utah State study of \$36,000 you would still have an overage in the budget of \$92,000, and it looks like it is a 50/40 break in terms of the timetable.

BOB FOTHERINGHAM: Your question is if we put it off until we have the other study done - I don't know.

WALLY JIBSON: Fundwise with the carryover we have now, plus the carryover we'll have in '87 from the present assessment, we would have sufficient money to start in the '87 fiscal year. We can't do anything in the '86 fiscal year now.

GEORGE CHRISTOPULOS: Because those funds are already committed. What would happen if you extended the Utah State consumptive use study?

WALLY JIBSON: My report shows projected through 1987 fiscal year.

LARRY ANDERSON: I may be able to help George. I prepared a budget assuming we were going to do this just to see what would happen. This is a different one than you had a minute ago. What I've done here George is extend our budget through the next three or four fiscal years to see what we're going to have. This agrees pretty close with Wally's. He came in this morning and we went over these numbers and made some quick changes and maybe some minor corrections are still needed, but within a couple of thousand dollars we agree.

At the end of this fiscal year, FY '86, July 1, we'll have an unexpended cash balance of around \$124,000. If we maintain the assessments as they are and extend the contract with the University for one more year (FY87), which is \$36,100, plus begin this new 1976 depletion study estimated at \$50,000, you will still have \$98,000 in unexpended cash balance to carry over to the beginning of the year 1988. In 1988 we would have finished the contract with the Universities, the depletion study would supposedly be in its last year at \$40,000. You would end up with an unexpended cash balance of \$143,000 to begin the FY89 fiscal year. The funding available to move ahead with it is based on the current assessments to the states.

GEORGE CHRISTOPULOS: That comes about by virtue of the fact that we reduced the number of gaging stations.

LARRY ANDERSON: That's shown in there. That's assumed there would be 18 gages in FY88 and I think we will end up with 17.

KEN DUNN: Mr. Chairman, on the stream gaging for FY87. Why is it so high in 87?

LARRY ANDERSON: This year we don't pay the assessment until September.

WALLY JIBSON: That's been the confusing thing, Ken. That's why we tried to iron it out. It brings in a little more confusion. I can see George was wondering why that was carried clear up into '88. We are talking to Ted about water year 1987 starting this October, but we won't pay for it until the '88 fiscal year here.

LARRY ANDERSON: This is just tentative. Wally does this in more detail. We hurried and ran this on the computer this morning and brought in the numbers that Wally was using so we're very close to his numbers in FY 86, 87, and 88.

GEORGE CHRISTOPULOS: Why would you use a base map of 1:100,000, just a convenience, rather than using a 7 1/2 min.?

BOB FOTHERINGHAM: Just because you can put the whole basin on a wall that way. We didn't want it to become so cumbersome. Idaho has already developed a lot of their computer data at that scale so we tried to fit it too.

HAL ANDERSON: There's sixteen 1:100,000 quads covered there. That's a manageable number when you think there's thirty-two 7 1/2 min. quads for each 1:100,000 quads.

GEORGE CHRISTOPULOS: I guess I don't fully comprehend what is going to be expected from each state. Each state is going to do the water right mapping for their state?

HAL ANDERSON: Basically, each state is going to be responsible for putting together all the information that's going to go into this themselves, all the manual mapping, going through the water rights file, make sure the irrigated lands are actually irrigated, determining what changes have occurred between 1980 and 1976, actually putting that into, maybe depending on whether the state wants to put it into computer readable form by putting it on a coordinate digitizer. Most of that work is going to be done by the individual states, but it will be coordinated

within the technical committee here to make sure the information is passed to Idaho and Utah and Wyoming in some sort of compatible format.

GEORGE CHRISTOPULOS: Okay, then rather than having that base map why aren't you going to have this map?

BOB FOTHERINGHAM: Because we're not bringing it up to date. We're just making the base map. That's all we're doing. We're not bringing water rights addition from '76 to now. We're just giving you a base map of what was done in '76. If you want changes then you need to specify that you want to show all of the changes, in other words, an update of what Utah's using and Idaho and Wyoming in their individual states in their additional allocations.

LARRY ANDERSON: That could be done. It would be a simple thing to do. Is it inexpensive or is that an expensive process to bring that back up to current times once you have the base map?

HAL ANDERSON: The majority of the work is already done.

BOB FOTHERINGHAM: I don't think it would be very costly.

GEORGE CHRISTOPULOS: The majority of the work where?

HAL ANDERSON: For the entire basin.

KEN DUNN: The only information they would have to add is increment of new development.

GEORGE CHRISTOPULOS: When was that work done and by whom?

BOB FOTHERINGHAM: It would have already been done to produce the base map.

LARRY ANDERSON: The flight was taken in 1980, so you would base it on the 1980 flight eliminating information off of that. You would come up with a map that would say - this is where it was in 1976.

BOB FOTHERINGHAM: If you want to know where it is today I would presume you would have to buy additional tapes for it. The most recent we could acquire and then you could plot what's different from the base map and show what's different on another graphic output.

HAL ANDERSON: You could certainly come up with a depletion figure by state irrigated lands in that particular category very easily because you will have to utilize it to come up with our '76 base map. We might not be so fortunate in our other non-agricultural pieces - municipal, industrial and that sort of thing. We're just going to be looking strictly at what was there in 1976 on those.

DR. NORM STAUFFER: I think this base map is only part of the picture. We have storage reservoirs that provide only supplemental irrigation. A Commission approved procedure is going to have to be another way to get at that. This doesn't tell you what the depletion is unless you have a full supply. This is only part of the picture.

HAL ANDERSON: That is indeed true. It's kind of a catch 22 situation if you think about it. We are trying to develop a base map and some computer tabulized data that can be used for calculating future depletions on all of the categories. Those depletion recommended procedures for calculating those depletions haven't been determined yet. We're trying to put together as much information as we can, as accurately as we can, and as uniform as we can that will be useful, hopefully down the road for calculating those future depletions. If we had a depletion estimation for each of the categories already established and agreed upon, it might be a little bit easier to do what we're doing now. Basically, all we're trying to do is not calculate depletions at all, but to provide the information necessary to calculate depletions at a future date.

GEORGE CHRISTOPULOS: Well you're doing two things here, I guess, aren't you. You're doing the water rights work, and then you are also doing, from the 1980 photos, the Landsat, you are going to indicate the actual irrigated lands. Those are the two things you actually are going to accomplish by this map. Then you go from there.

GEORGE CHRISTOPULOS: I think this question was probably answered earlier because what you're going to have is just this basemap with information on it, and then after that, as far as field work and so on, you're going to have to determine how much land you drop, keep in, keep out, what's actually happened on the ground where some lands may be sub-irrigated,

what's happening naturally as opposed to somebody putting water on artificially. Those things will have to be dealt with.

HAL ANDERSON: On a case-by-case basis you're going to find those areas where you had some idea what's going on, some areas where it's really confusing. You may fly over it and take some aerial photography of it. You may be able to talk with somebody that's been out there that knows, (SCS field office person) a number of different ways. There's a lot of different ways of getting information. They'll all be included.

GEORGE CHRISTOPULOS: On your page 1, when you talk about input necessary, you talk about wetland areas, what's the significance of that and what does that mean?

HAL ANDERSON: Basically it means, satellite data does not do a very good job of discriminating wetlands from irrigating croplands. That will be a landuse stratification developed on the base map to help remove and basically it's an agreed upon boundary of what we had in 1976 for the Commission's purposes to aid in future depletion calculations down the road. In other words, we've determined from our committees what we've all agreed are wetlands, whether or not there's some error in them or not. Next time down the road the same wetland map should be used in the inventory process so that you won't be confusing irrigated and wetland areas.

BOB FOTHERINGHAM: As part of that discussion, wetlands do use water. If they are using water now then we presume they shouldn't be additionally depleted and we need to come up with a basis as to where we establish a line.

GEORGE CHRISTOPULOS: You're still trying to establish as of January 1, 1976, the situation, no matter what the category is?

WALLY JIBSON: Wetlands in 1976 are wetlands today. As long as you are consistent when you go down the road 5 or 10 years, you're still calling those wetlands. If there's a little error, so what, as long as you are consistent. All we're really interested in is the difference between 1976 and 10 years hence, and 20 years hence.

HAL ANDERSON: The wetlands thing is more of an operational thing. You've established a boundary for it. It's difficult to do with just the satellite data itself, because there's always a little slop over. We've established a boundary for it on our base map that's going to be adinfinitum unless the Commission has found an area that's an error they want to modify and go from there. This is to establish a boundary for this particular landcover category. This will be used as an area to say anything that's in here we're not going to calculate any changes.

GEORGE CHRISTOPULOS: Let me ask you a leading question now. Getting back to the cost. Figures you show here are on your chart for each of the states. This would be money presumably drawn on by each of the states from the Commission funds in order to pay for the effort by each of the states. Is this reflective of the effort that Utah and Idaho's going to make and Wyoming's going to make in their state to do this work? Getting back to the point of what was raised earlier, how does that fit? Does this mean there's extra work being done by Idaho or is there much more work being done by Idaho because there's more lands irrigated in Idaho, or more lands irrigated in Utah?

HAL ANDERSON: A little bit of both.

GEORGE CHRISTOPULOS: Because of the lead nature of some of the things you might do or the fact something might be said to you and then you put it through your computer. It seems to me what we have to do as a part of this is to get that pinned down fairly well. I don't think it's fair for us to be paying 1/3 of the cost if more of the benefits go to Idaho or Utah than central Wyoming.

BOB FOTHERINGHAM: I don't think more of the benefits go to any state. The benefit is to the Commission to know what's irrigated and what's not.

GEORGE CHRISTOPULOS: Let me put it another way then, I don't think Wyoming should be paying a share of Utah or Idaho's cost of accomplishing this. I don't think it's fair to wind up with a 1/3 split all the way down the line.

KEN DUNN: That has a two-edged sword, Mr. Chairman, because Idaho has got equipment in place and we're not charging for the amortization of that either. If Wyoming wants to re-invent the wheel or Utah wants to re-invent the wheel we'll do it ourselves, I guess. It just doesn't make sense.

GEORGE CHRISTOPULOS: I think that's fine but I think those are things we have to look at.

WALLY JIBSON: George, that's very comparable to our stream gaging program. Each of the states pay 1/3 to Ted, yet the number of gaging stations in each of the states are not the same. Idaho has the fewest gaging stations, Wyoming is next and Utah has the greatest number, but that doesn't mean they are not advantageous to each of the states on an equal basis. We decided in the initial Compact that all states would pay equally on the cost of administering the Compact.

GEORGE CHRISTOPULOS: I raised it at this point, because I think it's appropriate to do so. If we do approve this and move ahead with it, we need to make sure we're together.

CHAIRMAN WRIGHT: I think the reason for the states paying equally is because if we ever got into an arena of trying to measure the value of various projects to each state and applied weights or indexes on that it would just be a zoo, and also the second reason is it is required by the Compact.

KEN DUNN: The problem I see is (1) the Compact says that the '76 base shall be established and depletions be accounted for and that's a Commission responsibility. The one way we can do it is have the Commission contract out to somebody to do the whole thing and each individual state see if they can agree on whatever they have. I think you'll end up doing it twice then because the states are going to have to virtually repeat what that contractor did in order to insure themselves that one state didn't get more than the other. The way it's being proposed here - the 3 states are trying to work together and do it once. It's still part of the Commission's job.

CHAIRMAN WRIGHT: Any other comment, George?

GEORGE CHRISTOPULOS: Just carrying that one step further. You could do it this way too, we could do this independently as long as we used the same guidelines and the same yardstick so that we knew we were comparable so we didn't do it one way in Wyoming and one way in Utah, and another way in Idaho. As long as you used the same criteria all the way through you are going to wind up with the same point. I don't think the Compact says the Commission has to do it. The Compact says you have to establish a manner in which you identify depletion as of 1976. Consequently, I don't have any argument with what we're doing, but I think we could do it completely independent of each other as long as it was done the same way. Your costs would then be more reflective of what effort is being made in each state. All I'm really saying is that I think it ought to be looked at. I'm not saying we should stop. I think we should go ahead with what's being proposed here. I think we have to look at it.

HAL ANDERSON: If you do it all independently there's always going to be that question in people's minds, just exactly what did they put into this category and then what did we put into that category. If we work together on it there will be a lot less of that.

CHAIRMAN WRIGHT: The question before the House, we say yes today or we wait until next November.

RODNEY WALLENTINE: I think we ought to vote on the Motion that was brought up by Larry and seconded by George and get on with the show and let them do it.

GEORGE CHRISTOPULOS: I think I seconded for purposes of discussion.

JOHN SHIELDS: I'm engineering advisor for Wyoming and I've worked with Bob and Hal Anderson on the technical advisory committee. Two points - the committee fully realizes there needs to be a lot of discussion by the Commission, itself, as to the cost breakdown. We provided you with a cost estimate and a timeframe estimate but as far as whether it's going to be split 33% each or it's going to be based upon the amount of services provided is the decision of the Commission. I think the committee fully

agrees with George that's something that needs to be discussed more fully by the Commission, itself.

With respect to field checking the costs have been divided. The \$90,000 does not include any of those field checking costs, therein. The states have different levels and different degrees of information available to them as a check against the work and the base map that the Technical Advisory Committee comes up with. It's something that's pretty hard to say at this time. In Wyoming we happen to have tabulated by varying degree a prepared quadrangle by quadrangle of the irrigated acreage. That would help us considerably, Idaho or Utah doesn't have the same thing.

CHAIRMAN WRIGHT: So it could be higher?

JOHN SHIELDS: It probably will be, because there isn't any field checking included in this cost estimate given to you today.

BOB FOTHERINGHAM: If it were contracted though, a lot of work would be done by the individual states working with the contractor anyway. Some of these costs are absorbed whether we list them or not.

WALLY JIBSON: Your budget estimate, Bob, the way you worked it out included so many man hours. You are including whether it's new men brought in, whether it's existing personnel, whatever. It's just so many man hours. I ^{have} had a little problem with this when we make payments from the Commission fund. Are you visualizing making payments to an individual state? We know when you buy the tapes those payments have to go wherever you buy the tapes, etc. I'm just having a little trouble visualizing how the payments are made and to whom.

BOB FOTHERINGHAM: Maybe we ought to have you come to a committee meeting. I don't know how that ought to be worked out.

GEORGE CHRISTOPULOS: I think it makes sense to pay it to the states and let them do whatever they are going to do.

BOB FOTHERINGHAM: I don't know how it ought to be done, really. It could be done that way or we could contract it to one state and have them subcontract it.

HAL ANDERSON: The easiest thing would be for each state to just submit a bill after they've got so many manhours on their books through their accounting systems or if they send in for the data or whatever just submit a bill.

CHAIRMAN WRIGHT: The states costs of conducting this study is in your estimate, right?

HAL ANDERSON: Sure. States sometimes don't like to do that, including ourselves. It's much nicer to have the money upfront you can work with and draw off on an account. It depends upon how the Commission decides to fund it. These are estimated costs. The actual costs may be \$40,000 instead of \$42,000 for Idaho and it might be \$20,000 for Wyoming instead of \$16,000. These are just estimated costs.

GEORGE CHRISTOPULOS: Is it proposed that everybody work with 7 1/2 min. quads to start with or is everybody going to the 1:100,000?

HAL ANDERSON: 1:100,000 will be the base. One beauty about the computer assisted approach is, it doesn't make any difference what map scale is.

GEORGE CHRISTOPULOS: I realize that. Let me ask another question that bothers me. What about the control location, horizontal control on this as far as knowing where you are?

HAL ANDERSON: If you are using the Landsat data base, the geometric control on that particular data is plus or minus 1 Landsat pixel, which happens to be eight-tenths of an acre or 200 feet, and it can be up to an acre and a half to two acres.

BOB FOTHERINGHAM: Are you saying what you do when you try to establish all of your overlays of information.

GEORGE CHRISTOPULOS: Not only that, I'm getting more basic than that. Here you are showing the lands that do not have water rights. In all 3 states the water rights are identified by 40 acre subdivisions. You'd better be on the right 40 if you are telling somebody they don't have a water right.

HAL ANDERSON & BOB FOTHERINGHAM: You will be.

GEORGE CHRISTOPULOS: How are you going to establish that? That's what I'm asking? How do you establish the horizontal control location on the ground as compared to section survey?

HAL ANDERSON: The section township grid will be digitized. It will be one of the overlays.

GEORGE CHRISTOPULOS: How do you establish that?

HAL ANDERSON: It will probably be digitized from 1:100,000. The township section corners are on the 1:100,000 maps. Landsat data is UTM registered.

GEORGE CHRISTOPULOS: Who makes maps the 1:100,000 scale size?

TED ARNOW: USGS makes the 1:100,000 dimension in a metric scale.

GEORGE CHRISTOPULOS: Does Idaho or Utah have any problems with resurveying of the Bear River drainage in their state?

BOB FOTHERINGHAM: That's one thing we'd have to find out. I don't know there's any problem right now.

WALLY JIBSON: Like your ^{tracts,} tracks and so forth? No, fortunately.

CHAIRMAN WRIGHT: Well we have a motion before the house. I guess the question is how do we allocate the expenditure of \$90,000 between the states. Is that still of some concern to you, George?

GEORGE CHRISTOPULOS: Well, it's a concern to me. I think we should probably go ahead and approve this in the Compact and continue to work on it. I think we should look a little more at this question of cost. When I see a chart like this I begin to wonder. As long as you can convince me it's doing extra work in Idaho for the good of the order that's fine.

BOB FOTHERINGHAM: We're wondering whether Wyoming's doing extra work or not.

CHAIRMAN WRIGHT: You could have a chart showing the ultimate benefit to the various states, as a result of this study, based upon dollars and perhaps the little bars would be a lot different. This is a subject that's just incredibly complex if you get into it. You open that kind of door. I think 1/3, 1/3, 1/3 at least at this point seems reasonable.

If you get into it, as you watch it, you may want to come up with something else, I don't know. At least a Motion is before the House to proceed with the study. Is it appropriate to ask for a vote at this time?

WES MYERS: I have no objection to going ahead with the study. I think we should go ahead with the motion. What's bringing this up is the all-out proportion on the basis of irrigated land in the different states. The ducks down by Salt Lake has got more acre-feet of water than all the people above Bear Lake. That's what's bringing this up. It is very inequitable. It's something we would like to have looked at. Other than that I'm going to vote for the Motion, but we should take a look at this as we expand things. This isn't written in the Compact. We're doing this so we can accomplish what is written in the Compact. We're making these things up as we are going along to accommodate what's in the Compact. These specifications are not written in the Compact.

LARRY ANDERSON: I was just going to say, Bob Fatheringham and I ran into the same problem that you brought up, George, on how do you contract for this study. We didn't come up with any good answers. It's obvious some of these things will be handled by the states and people are already being budgeted by each state to do this. If you were to enter into a contract with Utah for \$32,000, for example, to do the portion shown, we're probably not going to hire anybody new to do the work. Those people working for the state of Utah are already budgeted. We'll probably lapse part of this money back to the state at the end of the budget year.

DAN ROBERTS: Mr. Chairman, I'd like to make an observation. I've been on this thing long enough to see water short years and water long years. In water short years we want to put guards on everybody's headgate to be sure they don't take more than their share. On water long years they want to run it down through Pocatello. As we look at this thing, no two years are alike. I'd like to suggest we go ahead and share it on an equal basis among the states.

CHAIRMAN WRIGHT: We first have to address the Motion that Larry came out with.

GEORGE CHRISTOPULOS: We've probably voiced our opinion on that. I don't have any problem proceeding with the study. I just think we should look at the costs a little bit. I'd just like to better understand what we're going to get out of it. If Idaho's going to do some data processing and certainly they show \$10,000 of data processing, that's going to include data processing for Wyoming, which it is. I'd like to have some idea of what that cost would be. All we're really looking at is the fact these do tend to give you a picture, sometimes. If you put the benefits on there you might have them all at the same time. You are satisfying the requirements of the Compact by doing this kind of study.

WES MYERS: I would like to suggest we go ahead with this Motion but we defer this problem to our engineering committee for further study.

KEN DUNN: I don't think we can proceed unless we're agreed on how we're going to pay. The Motion is to begin a study that the individual states are going to incur some expenses in and if we aren't agreed who's going to pay for it I'm not going to start working in Idaho. We just can't do that.

BOB MORGAN: I think we need to keep it in context. All we're coming up with is a base map. We're finding the water use as of 1976. We're not determining any depletions whatsoever. I think the discussion, as I see before the Commission is to come up with the base map.

WALLY JIBSON: Still, you are going to incur some costs. If we pass the motion, we're authorizing you to incur some costs.

BOB MORGAN: That's correct.

WALLY JIBSON: Okay, the point Ken brings up is are we agreed when the Commission writes you a check that it is Commission funds - which is 1/3 each state, whether the check goes to Idaho, Utah or whatever?

GEORGE CHRISTOPULOS: I think we could do a couple of things here. First, before we started writing a check, we could agree to start the study. We know that everybody has money in it. The real question is do you split the cost out 1/3, 1/3, 1/3, regardless of who gets paid what. You could still start the study regardless of whether you decided that question or not, at this point.

WALLY JIBSON: Once we write a Commission check it seems to me we've said 1/3, 1/3, 1/3.

GEORGE CHRISTOPULOS: Not necessarily. You could have this a special study you could attribute it a different rate than 1/3, 1/3, 1/3.

The second suggestion is why don't we table this until after lunch.

BREAK.

CHAIRMAN WRIGHT: I'd just like to kick off the meeting with a couple of comments. (1) This complex subject who pays what for what. If we get into this kind of a thing on a continuing basis it's going to be opening up Pandora's box. At the beginning of the Bear River Compact, Idaho had a legitimate complaint saying we benefit less from this Compact than any of the other two states and yet Idaho pays 1/3. I think if we're going to get picayune about things like this it could lead to other subjects where we'll be nit-picking about who pays what for what. I think it's opening up a box that perhaps we could avoid. The benefits of a study like this could be quite beneficial in percentages way above the cost or the payment percentages of each state. You just don't know. We're here to talk it out, and we're here to hear all sides. So let's resume. We have a Motion that was made to get the study going. We had some conversation stating yes let's get the study going and reserve the method of payment for a future time. Ken Dunn's comment at that point is we've got to figure it out right now or otherwise we're not going to authorize the go ahead. That's where we are, gentlemen. I urge you to make your comments about this subject, right now.

RODNEY WALLENTINE: Could Wally draw up a contract and make the thing run through the Commission as it's proposed.

WALLY JIBSON: As it's proposed we can work out those details.

RODNEY WALLENTINE: But, would George agree with us?

WALLY JIBSON: We've got to decide on the basics, today. If it's 1/3, 1/3, and 1/3 we can work out the details.

DON GILBERT: Mr. Chairman, I see the Bear River basin as a cooperation, which all states own 1/3 of. I think they're obligated for 1/3 of the expenses. Does that make sense?

CHAIRMAN WRIGHT: No matter what the subject that comes up one state of the three is going to benefit more than another. If we're going to get ourselves into a crack by saying, okay let's figure out what the extent each state benefits and we'll allocate the cost based on those percentages, then we've really got long meetings ahead. I think it should be resolved.

DAN ROBERTS: I think to simplify the thing we need to share this in equal amounts - 1/3, 1/3, 1/3. That would be my feeling. That's what I'd favor.

CHAIRMAN WRIGHT: George, what are your thoughts?

GEORGE CHRISTOPULOS: In the first place, I don't think we've ever raised a question about any other monetary contribution. I think it's been raised in connection with this specific situation, not with others. I think it's a valid point in this case. Part of it's not fully comprehending what's going into the thing. What I've looked at is just the report I got from the committee. That's all I've looked at today. I kind of sit here and chuckle. I haven't heard much from Utah, but I've heard quite a bit from this side of the table over here. I don't know that I want to particularly prolong this thing. I think we would go along with what's being proposed, but I think we would reserve the right to look at it again as this thing unfolds. If we feel there should be some sort of an adjustment to make I'll raise it again. I think that's a reasonable approach to it. I think we can do that. That's the serious part of it. Maybe the less serious, but equally applicable. I think that from now on we ought to have all the Bear River meetings in Cheyenne, Wyoming.

CHAIRMAN WRIGHT: I think it would be very helpful, Larry, to get some of these documents in advance of the meeting, so the people on the Commission have time to digest them and cover their points of view. It happens at every other board meeting. You always get the thing in advance so you have a chance to take a look at it.

LARRY ANDERSON: We'd be more than happy to send them out in advance if we have them.

KEN DUNN: Mr. Chairman, I'd be happy to hold any summer meetings in Cheyenne. It seems to me that if we're going to proceed with this now there has to be a definite decision on how the money is going to come, either we're going to do this on a 1/3 basis as all other assessments are shared by the Commission or some other number. I am not willing to commit my staff to begin the project until I know what the distribution of the monies would be. If we can't agree on that today, I think there's another option we might want to look at and that is contracting the whole kit and kaboodle out to a consultant someplace. That's going to be substantially more expensive, but maybe that would satisfy people. If we can't agree on either the consultant or the split today, I think we ought to put it off until the fall meeting. Hopefully then, if it's necessary to get the technical committee back together again, get them together and redo the report. I read their report a week ago, and it satisfied me. I don't know if everybody else got a copy from their staff or not, but I did.

CHAIRMAN WRIGHT: This has nothing to do with this subject, but it's later on in the agenda, where George, we're proposing to take a look at these unexpended cash balances that are substantial. Really, there's no excuse for them. We're recommending we consider, down the road, less fee income from the various states, that's another subject, I just thought I'd throw in here at this point.

LARRY ANDERSON: Mr. Chairman, as far as we're concerned in Utah we would like to move ahead with the study. If we put the decision off another 6 months, that's fine, but we've lost 6 months of time. I'm not sure what type of new direction we could give the committee so they can come back with a new proposal. I think the committee had a couple of choices and

they've looked at those. We could still agree to let each state do their own work and then bring back to results to the committee and have the committee look at them and try to resolve any overlapping problems that occur on the boundaries. We could agree to hire a consultant to do the whole thing for the Commission.

CHAIRMAN WRIGHT: I think most everyone feels comfortable with it. It's to the point we're not discussing this is the right way to go, it's the question of how to pay for it. Everyone, I think, feels this is the correct way to go. Contracting it out is more expensive. The third alternative you suggested doing it independently you lose the coordination and control these gentlemen can provide. There's disadvantages to going any other direction.

LARRY ANDERSON: In addition to this being completed, I see the states making use of this data. This is going to be the base map of what's depleted in 1976. I see the state of Utah calling this information up and using it for other things we're doing. Every so often the Commission will want to know what's being depleted by each state since 1976. It's certainly not going to be necessary during times of high flow, but as each state develops more and more of its compact allotment the need for that information for the Commission will be important. That will be an additional cost to the Commission at some time.

CHAIRMAN WRIGHT: We have a Motion on the floor to get started on this thing. Is there any further discussion on this? If there's still some controversy on making the payment perhaps we ought to defer this until November, and give people time to think about it.

GEORGE CHRISTOPULOS: I have mixed feelings on that idea. We did talk about it considerably during lunch. I guess I don't have any real problems proceeding, but I want to reserve the right that you always have anyway to change our minds. I'm not saying that's going to happen at all. I think we should approve it. We should do either one of two things approve it and proceed, or delay it for 6 months. If we approve it, I would say it be with the idea that we approve it with the concept of breaking the costs down just the way they are shown. If, for some

reason, 6 months from now or even some other time I feel strongly about it I'm going to bring it back up. I don't intend to do it at this point unless something comes to my attention I'm not aware of right now.

LARRY ANDERSON: I don't have a problem with what George wants to do. It seems like we're approving it if we go now with the idea we're going to spend as much as \$50,000 in FY87. If there's a reason to bring it up on the FY88 budget year we could do that then. At least the costs will be incurred and the planning put together through 1987. We could talk about it again, if it needs to be, in 1988. I don't think that would put anybody in too much trouble.

RODNEY WALLENTINE: Is it then going to be run through Wally and the Commission, by contract. Is that what you're saying, Larry?

LARRY ANDERSON: It seems like the difficult thing is how to contract. It seems like the Commission ought to try to figure some way of contracting with each state. It would be a "not-to-exceed" contract and therefore it would be a firm number. We would feel comfortable with that in Utah - a "not-to-exceed" amount.

HAL ANDERSON: It was always our intention, as a committee, to be as flexible as we could be because of where each state is and where they are going with these capabilities. Remember these are estimated budget breakdowns that you are seeing there and they are not saying for sure this is exactly what they are going to cost. This is just an estimate based on the proportion of breakdown of work within each state as they are seen now. There is some room for additional flexibility depending on what actually occurs.

LARRY ANDERSON: We would be willing to make a firm proposal to the Commission of a "not-to-exceed" amount for Utah to do its share shown on the proposal.

WALLY JIBSON: The thing we need to do today is to firm up the 1987 budget so we can approve it, at least on this maximum. If you approve \$50,000 for the study, it doesn't mean you have to spend \$50,000. We do need to approve the maximum of what we're going to spend in '87.

CHAIRMAN WRIGHT: Ken has great difficulty saying okay let's work on the project and we'll work out the method of payment later.

LARRY ANDERSON: I don't think it has anything to do with method of payment. We would assume for this year there will be so much work done and that will be part of the contract written. We would try to write a contract for the total study broken down into two fiscal years, and assume the Commission would have to approve the budget in 1988 for the second year. I would not feel comfortable in entering an open-ended contract without talking about it. I couldn't do it legally in the State Division of Water Resources. I wouldn't think the Commission would want to do it that way, either.

CHAIRMAN WRIGHT: Would someone restate the Motion?

LARRY ANDERSON: I made a Motion that the Commission approve the 1976 depletion studies as outlined in the memo from the Special Committee. Estimated total cost is \$92,000 to be broken out in \$50,000 in FY1987, \$42,000 FY1988, each state would enter into a contract with the Commission for completing their portion of the study. That contract would be a "not-to-exceed" amount, with cost items broken down by fiscal year and by items to be completed.

DAN ROBERTS: I'll second the Motion.

CHAIRMAN WRIGHT: Any discussion?

KEN DUNN: Do you want a contract for both the years, or do you want a contract for the FY1987?

LARRY ANDERSON: A contract for the entire amount with it broken down in two phases - phase one and phase two - phase one in 1987, and phase two in 1988, with the option the Commission has to approve the budget for phase two before the work begins.

CHAIRMAN WRIGHT: Any further discussion? All in favor, opposed?

MOTION CARRIED.

LARRY ANDERSON: I'll make an additional Motion to send the assignment back to the committee for them to come back with a recommendation from each representative of their state as to who that contract should be with in their state and an itemized proposal for the costs associated with each state, so Wally and I can figure out how to draw up those contracts.

WALLY JIBSON: Do we need that for both fiscal years now, or just for 1987?

LARRY ANDERSON: I think we need it for the entire amount broken down by fiscal year.

HAL ANDERSON: When should that report be back from the committee?

LARRY ANDERSON: I think we need it back within 30 days, if you want to start right away.

WALLY JIBSON: Are you set up now, as your report would indicate, that you can start this. Do you want to start it in the '86 fiscal year?

LARRY ANDERSON: Let's assume there would be no billings in the '86 fiscal year so we don't have to worry about that.

WALLY JIBSON: All right, let's start it in the '87 fiscal year whether you do your work in May, June or July.

BOB MORGAN: We're ready to start in FY1987.

CHAIRMAN WRIGHT: We have a Motion on the floor to have the various states get back to Wally and Larry with an itemized proposal that can be used throughout the contract. Is there a second?

DAN ROBERTS: I'll second the Motion.

HAL ANDERSON: Do we have any sort of guideline as to just exactly what the Commission would like as far as itemized breakdown.

LARRY ANDERSON: I think you need to break down the tasks on a flow chart. Those costs need to be broken down by those graphs.

CHAIRMAN WRIGHT: Any discussion? All in favor, opposed?

MOTION CARRIED.

EXTENSION OF CONSUMPTIVE USE STUDY BY UNIVERSITIES

ROBERT HILL: It is my understanding that each of the Commission members received a copy of the report we submitted to Larry Anderson recording this extension. I have just prepared a 3 page summary for reference. We may not need to refer to that. The little 3 page summary is mainly for the information of those in the audience, however it does include a table that shows seasonal consumptive use from May 15 to October 15, that was not in the original before.

In the report of March 7, submitted to Larry Anderson, we, as a university group - Chuck Brockway, Bob Burman, and myself, recommended the Bear River Commission fund this project at the present level for one more year, and they extend the completion date until April 1, 1988, prior to the Commission meeting of April, 1988, which will allow us two more years of field data collection with sufficient additional time to finish the final report for presentation to the Commission in their meeting of April, 1988. We go into reasons for why we make that recommendation. An explanation of the recommendation, we are asking for \$36,120 additional funding, which would get two more years worth of data collection at the lysimeter sites. We would close down the Talmedge site and the Preston site and not collect data there as we have done heretofore. We'll reduce the extent of the study but extend it in time.

WALLY JIBSON When would you close those sites? this year or next year?

ROBERT HILL: We won't put the stations out this year.

For your information, we've already placed a weather station at Hilliard Flat and we'll take additional readings on the lysimeters there, and the station at Randolph has already been placed out, and we'll take additional readings on the station there. The station at Montpelier has not yet been put out.

If the study were extended, as we recommend, we would, upon approval today, authorize construction of two more lysimeters which we will place adjacent to the stackyard in Montpelier, out in the irrigated meadow areas, being more represented of what is being irrigated and

harvested, than what now exists in that stackyard. We would continue the lysimeters in the stackyard as a comparison reference to get us back in time and forward the next two years. That's essentially in summary what we've recommended.

WALLY JIBSON: Do you say you'll put new lysimeters at Montpelier?

ROBERT HILL: Two - this spring. We'll leave the 3 that remain in the stackyard. We won't try to dig those up. We'll construct two new ones and put them across the fence at some location we agree on. We'll still keep the weather station at the same site, but be close enough to not have to fuss around with it. We'll maintain those for two additional years.

KEN DUNN: How many years of record will you then have at the various sites?

ROBERT HILL: We'll have weather data since 1982 at all sites, except Montpelier. We have weather from 1982 at Hilliard, Randolph and Talmedge, so at Montpelier we'll have weather data from 1983 through 87, Randolph 82-87 and Hilliard 82-87.

KEN DUNN: You'll have the rest of the data at Montpelier.

ROBERT HILL: The lysimeters were installed in June of 1983, so we'll have a consistent record of lysimeter data from '83 to '87 except for the two new ones that were put in this spring. That'll be '86 and '87.

KEN DUNN: The earlier measurements at Montpelier aren't any good?

ROBERT HILL: Well, we're not saying they aren't any good. We don't feel they represent the meadow, and that's because of what happened in that stackyard over the winter after the lysimeter was installed. We will keep them there because they'll let us correlate to something back through '83.

REED DAYTON: Why would you have 3 in one area?

ROBERT HILL: In Montpelier? There were 3 different vegetation types within a very short distance in that particular stackyard. We put one in a rush area and the other two were in sort of a grass and a

grass-mixture. Now it's turned out the one has gone mostly to the weeds and the other is not too much grass and the rushes are still there. That's why there's three at that particular location. At the other two sites the vegetation is essentially the same. We put two lysimeters removed a little distance from each other to give us some comparison.

WALLY JIBSON: The Commission understands that by funding through the '87 fiscal year we're getting two more years of field data - we're getting this summer and next summer.

RODNEY WALLENTINE: Did you prepare this enclosed budget including his proposal today?

WALLY JIBSON: I didn't. I included his proposal for one year, but we'll get two years field data. That's why the postponement of the final report.

ROBERT HILL: You funded the \$36,120 with a completion date of April 1, 1988.

CHAIRMAN WRIGHT: Is there a Motion that we approve the expenditure of \$36,120 for fiscal '87?

RODNEY WALLENTINE: I so move.

BLAIR FRANCIS: I second the Motion.

CHAIRMAN WRIGHT: All in favor, opposed?

MOTION CARRIED.

JOHN SHIELDS: I have a question, Mr. Chairman. There was an adjustment made to the measured lysimeter water use at Montpelier for June, 1985. That's explained in some detail in a report you sent to us. I was curious why the same adjustment wasn't made to the Hilliard site in '83 and '84. It looks just as suspect to me as does the June of '85 at Montpelier. I think your standard deviation figures indicate that figure would perhaps need an adjustment too.

ROBERT HILL: That's a real good question and if you'll refer to the second page of this brief little report I handed out you can see what John is talking about. The question was on the adjustment for June of 1985, which I think was explained in the November meeting and also in the report. Wally reviewed the minutes and it was mentioned there, and because of the dry condition on those lysimeters at Montpelier it was inappropriate. The adjustment mentioned by John, for September of 1984, would really go back to the fact we had an 8 degree temperature on September 15 or 16. Growth was essentially stopped abruptly in 1984. It's not an adjustment because of a dryness of the lysimeter, it's a weather condition that existed at Hilliard Flat. We do not feel we need to make an adjustment for that - that's real life.

JOHN SHIELDS: That 8 degree temperature wasn't reflected in the calculation of the Blaney-Criddle was it? You had about the same amount of ET potential using the two methods and yet the measurement was way below that.

ROBERT HILL: That would have been the growing season had essentially stopped. Here's another thing it brings up. This year the weather stations are out a month early because of the conditions of this year. This point George brought up some time back is that we have seen 2 wet years in 1983 and 1984, '85 was more a normal type year and '86 I don't know what we're going to call this, it's starting pretty early. I think this supports the reasoning we have. We need it. Originally we proposed 5 years, and we just feel we need that length of time because we see things changing back and forth. John, I don't know, coming back to your comment, will we need to make an adjustment for April of 1986, which will be different than anything else that's happened in April of '83, '84, '85.

JOHN SHIELDS: What about the other methods that you are comparing this to, you've been reported as a Blaney-Criddle and modified Penman, are there other methods in addition to that? Have you more or less discarded those other 17?

ROBERT HILL: I don't feel we've discarded anything particular. This is an issue of some fair discussion among us as university people as to what method. Our preferred approach would be to use the Penman type equation because we feel it's physically based and more accurate, but we recognize as you go back in history we don't have sufficient data to do a Penman on a day-to-day or weekly basis. That's part of our calibration requirements, we will look at what we do, and there's not a consensus of opinion among us at the universities. It's still an open question. Our current thinking is that we'll probably have to use something that's a simple approach, temperature-based, whether it's a modified Blaney-Criddle or some calibrated version of the Blaney-Criddle. Something similar to that is our current thinking for the long-term approach. I think we can fairly say in the future in Idaho and Utah and Wyoming we're putting out some fairly sophisticated weather stations that would allow us to use any equation. That's in the future. We're talking about a historical study and we'll have to temper our judgment on it.

UNFINISHED BUSINESS

LARRY ANDERSON: Mr. Chairman, I'd like to bring up an item relating to the assessment to the states and I'd like to pass out a handout to all of the Commissioners. I've suggested we might want to consider reducing the annual assessment to the states based on our projected expenditures.

As you will remember from the earlier handout you received - BRC2 - it shows an annual assessment to the states of \$42,000 a year. The assessment that each state is currently paying shows at the end of each fiscal year, based on the decisions that have already been made today, the contracts with the universities for one additional year and funds for the depletion studies based on \$50,000 in 1987 and \$42,000 in 1988. It shows the unexpended cash balance for each year, 1987 an unexpended cash balance of about \$98,000, in '88 about \$143,000 and '89 \$225,000. In '89 all of the studies are completed. That's projected out a long ways and may not occur or there may be something else that will come out we will want to begin funding. As you can see we're starting to build up a large surplus. That may not be wise in these times of tight state budgets. I

have passed out another handout to you - BRC1 - which shows the possibility of reducing the assessment to each state beginning in 1987 to \$35,000 per year and then in 1988 and 1989 fiscal years - \$30,000 per year. That would still leave, assuming those other conditions exist, an unexpended cash balance in 1989 of \$137,940 available to the Commission to do other things.

The assessments were raised a couple of years ago so the studies we've been talking about today can be completed and to increase the surplus funds to around \$100,000 for the Commission. Any number of combinations could be used to do that. This is just one of 3 or 4 options that we looked at to accomplish these objectives. I'd like to open this up to discussion and the appropriate way to do that is for me to make a Motion to adopt these new assessments for the state in fiscal year '87-'88, and then if there's some discussion on it we can go to that point.

RODNEY WALLENTINE: I second the Motion.

WALLY JIBSON: On your fiscal year '88, which would also apply to '89 stream gaging, \$37,750.00. Don't you think we should take \$4,150.00 to reflect 17 stations instead of 18?

LARRY ANDERSON: I think you'll only take off half of that amount - \$2025.00. Actually we have a little over \$2000 more money shown in stream gaging than that final approved by the Commission. You would end up with \$4000 more surplus in 1989 than shown there.

GEORGE CHRISTOPULOS: I think we're on the right track when we do this, however, looking at FY89, I think we've been told, and I think that's true whatever we do with this Commission study on depletion we're going to have to do something beyond this next two years. I think, consequently, maybe this is all right for planning, maybe it's all right to approve it, but I think we ought to keep in mind probably come around FY89, we'd want to put some money back in for that type of an activity. I think it's going to happen. I think we're going to spend some money.

LARRY ANDERSON: George, I had noticed as I went through this that in 1989 the assessment plus the interest on savings would bring in about \$100,000 a year, yet if you go down to the total expenditures by the Commission, you're looking at about \$50,000 a year; so that left a block of almost \$50,000 that could be used for additional studies. I would assume some additional work needs to be done to come up with the Commission approved process for charging depletions for new water users after 1976. There still appears to be adequate funding to do that with the proposed budget. I hate to lower the dues down and then raise them again because I'm going to run into problems with my legislature and I suspect you gentlemen will have the same problem. If I'm proposing too much of a decrease let's raise it back up again. That's the reason I made the motion so we could discuss these types of issues.

WALLY JIBSON: This \$35,000 would apply to this year's assessment - the first of October. Bert gets a billing out to you along in October. The \$42,000 has been approved through '88.

LARRY ANDERSON: We're talking about modifying an approved budget.

WES MYERS: I certainly agree with the principle.

CHAIRMAN WRIGHT: I don't think it goes far enough, but I'm glad it's for two years so it gives us a chance to re-review '89 when it comes up. All in favor, opposed?

MOTION CARRIED.

WALLY JIBSON: I'll need to prepare a revised budget and in preparing that we add another small item or two to take care of the Treasurer's bond, an audit was going a little above the amount I budgeted for. By November we'll have another revised budget based on today's actions.

RODNEY WALLENTINE: I have a lot of constituency asking me if you've dropped the Smiths Fork Dam based on what we discussed last November.

REED DAYTON: It's never been dropped. It's my understanding when I last talked to Mike O'Grady they're reconsidering moving the dam upstream and maybe doing work - core drilling and such. They'll build the dam about 50,000 acre-feet. This is the last information I have.

JOHN TEICHERT: Lyle Summers is supposed to have a cost analysis out on that in the next few days.

ELECTION OF OFFICERS

CHAIRMAN WRIGHT: Don Gilbert is retiring as Vice-Chairman and Wyoming is next on the rotational schedule. The other office is Secretary-Treasurer. May we have nominations for Vice-Chairman from the Wyoming delegation.

GEORGE CHRISTOPULOS: I'll nominate Reed Dayton.

BLAIR FRANCIS: I'll second it.

DAN ROBERTS: I move nominations cease and we have a unanimous ballot.

CHAIRMAN WRIGHT: All in favor, opposed.

MOTION CARRIED.

CHAIRMAN WRIGHT: Is there a nomination for Secretary-Treasurer?

PAUL HOLMGREN: I'll nominate Larry Anderson as Secretary-Treasurer.

RODNEY WALLENTINE: I second it.

CHAIRMAN WRIGHT: All those in favor, opposed?

MOTION CARRIED.

APPROVAL OF CONTRACT FOR ENGINEER-MANAGER

WALLY JIBSON: I'm suggesting we leave it where it was this year. I'll have a couple of thousand dollars to turn back this year. I had other things going the last two or three months so I didn't do as much work for the Commission as I do ordinarily. If we leave it where it is we know we'll have enough for next year and get the biennial report out.

LARRY ANDERSON: I'll make the Motion we approve Wally Jibson's contract for another year.

DAN ROBERTS: I'll second it.

CHAIRMAN WRIGHT: All in favor, opposed?

MOTION CARRIED.

Meeting adjourned at 2:45 p.m.

BEAR RIVER COMMISSION

REGULAR MEETING

Nov. 25, 1985

Summary of Minutes

Inadvertently shown as "ANNUAL" meeting on cover page.

Dan Lawrence and Connie Borrowman in attendance and each presented with an engraved plaque in recognition of many years service to the Commission. Each made a short response.

The Engineer-Mgr report showed that 1985 runoff had been normal from the Upper Bear but deficient from Smiths Fork. In the Wyoming Section, Central Division, diverted less than its allocation during the period of Water Emergency --after July 1984. Also mentioned a serious bank break in the river channel above

Bert Page presented the Treasurer's report following which a question was raised by the Chairman as to projecting the balance at the end of the fiscal year showing the expected amount of carryover estimated \$35,000 will be carried over in the current fiscal year. Also discussed the somewhat confusing procedure brought about in fiscal year of paying the current water-year account to the next from the next fiscal-year budget. (Discussed in my report to

Bob Hill gave a progress report on the consumptive use study. One coefficient cannot be used to fit all lysimeter sites in the basin when applying the Blaney-Criddle method of estimating consumptive use. Bob reported that he isn't comfortable drawing conclusions from the data on hand, particularly in the Montpelier area where change in soil moisture has created a problem with lysimeter location. It was agreed that at our April meeting, would discuss further a proposal for the consumptive use program.

Lyle Summers, Utah Division of Water Resources, presented a report on economic feasibility of the Smiths Fork project. He reported that the overall Benefit/Cost ratio was .56 or a benefit of 56 cents for each dollar spent. Various features of the project and assumptions were discussed.

Bob Morgan reported for the Engineer's Committee first determination of gaging stations and second, determination of acreage for consumptive use as of January 1976. Gaging stations were divided into three groups, (1) those needed directly for Compact administration, (2) those indirectly needed or used as streamflow indicators, and (3) stations not needed for Compact purposes. Excluding UP&L stations, 15 co-op stations were included in the first group, 8 in the second, and 15 in the third group.

Considerable discussion showed some disagreement relating to financing responsibility of the Commission. Consensus was that the State and local interests to plan for incorporation of certain projects in their programs and because of disagreement on particular projects should be left active through September 30, and definite decisions made in the April meeting.

Bob Fotheringham in discussing acreage and depletion data reported that the committee considered using 1975 or 1980 data. The 1975 data used in the University study and 1980 used in preliminary work in Idaho, being of better quality. Implementation could be by having each State responsible for data production, each State could work individually, or project could be contracted. A motion was approved to use 1980 data and have the project develop some costs and guidelines prior to the April meeting.

BEAR RIVER COMMISSION
880 River Heights Blvd.
Logan, Utah 84321

April 21, 1986

Engineer-Mgr Report

Wallace N. Jibson

1986 Water Supply and Compact Operation

Water Supply

Seasonal streamflow is expected to be well above average in all areas of Bear River basin according to snow measurements made at the end of March. This represents about a nine-percent decline from March 1 forecasts. Irrigators in Wyoming and Idaho who are dependent on Smiths Fork runoff will welcome the expected increase from 82 percent in 1985 to 126 percent in 1986. The Upper Bear and Logan River are expected to yield 127 percent and 33 percent respectively of the 1961-80 average for the April-July period.

The following table shows a comparison of measured runoff in 1984 and 1985 with that being forecast for 1986 and with the 1961-80 (20-year) average. This updated base period includes the dry 1961 season and gives a slightly lower average than in the previous base period.

Streamflow in Acre-Feet

	<u>April-July</u>				Forecast as Percent of Average
	Average 1961-80	Measured 1984	Measured 1985	Forecast 1986	
Upper Bear	110,000	162,000	123,400	140,000	127%
Smiths Fork	119,000*	165,500*	97,100*	151,000*	126%
Logan River	116,000	212,000	123,300	155,000	133%

* April-September

Reservoirs

Winter draft from Bear Lake (See page 3) was somewhat less than in recent years, but the warm and wet spell in February caused a sharp upturn about six weeks ahead of the usual pattern that would have dropped the Lake surface to about 5,918 feet by the last of March. Instead, by mid-April the Lake surface was at 5,919.89 feet elevation with content of 1,157,000 acre-feet. Inflow through the Rainbow Canal on April 14 was 1,960 cfs with the Outlet Canal discharging 1,040 cfs.

Woodruff Narrows and Woodruff Creek Reservoirs have been spilling (March 10) with Sulphur Creek about three feet below spillway at that time. Extremely high runoff occurred earlier in the channel below Hyrum Reservoir, and Porcupine Reservoir was almost full at the last observation.

Budget

Changing the end of the fiscal year to June 30 requires payment of the 1986 water-year obligation from the 1987 fiscal-year budget. Cost per gaging station changes each year, so the budgeted amount for stream gaging in 1987 will not agree with the 1986 water-year obligation due to be paid September 30, 1986.

I have discussed with Bert Page some alternatives and it is our recommendation that the current fiscal-year budget should include the previous water-year allocation for stream gaging. Thus, the 1987 fiscal-year budget for stream gaging will equal the amount in the 1986 water-year agreement with the USGS.

Previously approved budget estimates for fiscal years 1986 through 1988 have been revised for your consideration (See page 4), not only to incorporate the above recommendation but to include three other significant changes, two of which are on the agenda for action today. First, the cost of printing the Biennial Report is moved ahead to the fiscal year in which payment is made rather than in the year that the charges are incurred. This change is for auditing purposes. Second, because of the recommendation of the depletion study team (Bob Hill), I have extended this study for one more year at the same cost as in the previous years. And third, for the 1987 water year (1988 fiscal year) I have arbitrarily budgeted for 18 gaging stations rather than the usual 32. Included would be 17 sites recommended by the Engineering Committee last November plus Bear River below Smiths Fork, one of the four questionable stations mentioned in a motion approved in November.

Ted Arnow has given us a firm figure for the 1987 water-year program of \$4,150 per gaging station plus a total of \$800 (\$400 each side) to continue publishing the three records at Cutler Dam. Again, I am not recommending 18 or any other number of gaging stations but have included this number in the fiscal year ending 6-30-88 for comparative purposes. It is interesting to note that the reduction in stream gaging approximately offsets in one year the addition of one more year in the depletion study. Also of interest is that the three-year total assessment to the States of \$378,000 compares to a three-year budget estimate of \$273,015 which leaves a balance in excess of \$100,000 for a base map and depletion determination to implement administration of the Amended Compact.

Consideration of these proposed revisions in budgets that have been previously approved should await other actions of the Commission today.

Applications for Appropriation

Again, only a few applications for appropriation have been reported by the State Engineers for the past six months. These are summarized on the last two pages of the report.

BRC1

BEAR RIVER COMMISSION INCOME / EXPENDITURE FORECAST THROUGH FY 88

DESCRIPTION	FY 85	FY 86	FY 87	FY 88	FY 89
INCOME					
BEGINNING BALANCE	\$115,591.65	\$98,775.62	\$123,860.62	\$77,160.62	\$86,990.62
IDAHO	\$29,000.00	\$42,000.00	\$35,000.00	\$30,000.00	\$30,000.00
UTAH	\$29,000.00	\$42,000.00	\$35,000.00	\$30,000.00	\$30,000.00
WYOMING	\$29,000.00	\$42,000.00	\$35,000.00	\$30,000.00	\$30,000.00
INTEREST ON SAVINGS	\$10,687.06	\$10,000.00	\$10,000.00	\$10,500.00	\$11,000.00
TOTAL INCOME	<u>\$213,278.71</u>	<u>\$234,775.62</u>	<u>\$238,860.62</u>	<u>\$177,660.62</u>	<u>\$187,990.62</u>
EXPENDITURES					
STREAM GAGING-U.S.G.S.	\$59,840.00	\$62,240.00	\$65,190.00	\$37,750.00	\$39,600.00
PERSONAL SERVICES	\$7,467.59	\$8,600.00	\$8,600.00	\$8,600.00	\$8,600.00
TRAVEL	\$0.00	\$400.00	\$400.00	\$400.00	\$400.00
OFFICE EXPENSES	\$32.00	\$200.00	\$200.00	\$200.00	\$200.00
TREASURE'S BOND & AUDIT	\$556.50	\$560.00	\$590.00	\$620.00	\$650.00
PRINTING & REPRODUCTION	\$949.00	\$100.00	\$100.00	\$100.00	\$100.00
PRINTING BIENNIAL REPORT	\$0.00	\$2,195.00	\$0.00	\$2,500.00	\$0.00
LEGAL CONSULTANT	\$508.00	\$500.00	\$500.00	\$500.00	\$500.00
CONTRACT-UNIVERSITIES	\$45,150.00	\$36,120.00	\$36,120.00	\$0.00	\$0.00
1976 DEPLETION STUDY	\$0.00	\$0.00	\$50,000.00	\$40,000.00	\$0.00
TOTAL EXPENDITURES	<u>\$114,503.09</u>	<u>\$110,915.00</u>	<u>\$161,700.00</u>	<u>\$90,670.00</u>	<u>\$50,050.00</u>
UNEXPENDED CASH BALANCE	\$98,775.62	\$123,860.62	\$77,160.62	\$86,990.62	\$137,940.62

BRC2

BEAR RIVER COMMISSION INCOME / EXPENDITURE FORECAST THROUGH FY 88

DESCRIPTION	FY 85	FY 86	FY 87	FY 88	FY 89
INCOME					
BEGINNING BALANCE	\$115,591.65	\$98,775.62	\$123,860.62	\$98,160.62	\$143,990.62
IDAHO	\$29,000.00	\$42,000.00	\$42,000.00	\$42,000.00	\$42,000.00
UTAH	\$29,000.00	\$42,000.00	\$42,000.00	\$42,000.00	\$42,000.00
WYOMING	\$29,000.00	\$42,000.00	\$42,000.00	\$42,000.00	\$42,000.00
INTEREST ON SAVINGS	\$10,687.06	\$10,000.00	\$10,000.00	\$10,500.00	\$11,000.00
TOTAL INCOME	\$213,278.71	\$234,775.62	\$259,860.62	\$234,660.62	\$280,990.62
EXPENDITURES					
STREAM GAGING-U.S.G.S.	\$59,840.00	\$62,240.00	\$65,190.00	\$37,750.00	\$44,885.00
PERSONAL SERVICES	\$7,467.59	\$8,600.00	\$8,600.00	\$8,600.00	\$8,600.00
TRAVEL	\$0.00	\$400.00	\$400.00	\$400.00	\$400.00
OFFICE EXPENSES	\$32.00	\$200.00	\$200.00	\$200.00	\$200.00
TREASURE'S BOND & AUDIT	\$556.50	\$560.00	\$590.00	\$620.00	\$650.00
PRINTING & REPRODUCTION	\$949.00	\$100.00	\$100.00	\$100.00	\$100.00
PRINTING BIENNIAL REPORT	\$0.00	\$2,195.00	\$0.00	\$2,500.00	\$0.00
LEGAL CONSULTANT	\$508.00	\$500.00	\$500.00	\$500.00	\$500.00
CONTRACT-UNIVERSITIES	\$45,150.00	\$36,120.00	\$36,120.00	\$0.00	\$0.00
1976 DEPLETION STUDY	\$0.00	\$0.00	\$50,000.00	\$40,000.00	\$0.00
TOTAL EXPENDITURES	\$114,503.09	\$110,915.00	\$161,700.00	\$90,670.00	\$55,335.00
UNEXPENDED CASH BALANCE	\$98,775.62	\$123,860.62	\$98,160.62	\$143,990.62	\$225,655.62

BEAR RIVER COMMISSION

DETAILS OF EXPENDITURES

FOR PERIOD ENDING MARCH 31, 1986

125	VanCott, Bagley	\$500.00
126	Void	\$0.00
127	Wally Jibson	\$1,181.97
128	Rose Printing	\$2,195.00
129	Wally Jibson	\$671.79
130	USGS	\$62,240.00
131	Utah State Treasurer	\$50,000.00
132	Creative Awards by Lane	\$231.52
133	Wally Jibson	\$1,055.01
134	Void	\$0.00
-	Bank Charges	\$18.68

		\$118,093.97
	Less Savings Account	\$50,000.00

	Total Expenses	\$68,093.97

BANK RECONCILIATION

March 31, 1985

Cash in Bank per Statement 04-01-85	\$34,247.94
Less: Outstanding Checks	\$0.00

Total Cash in Bank	\$34,247.94
Plus: Savings Account-Utan State Treasurer	\$130,903.57

TOTAL CASH IN SAVINGS AND IN CHECKING ACCOUNT	\$165,151.51

BEAR RIVER COMMISSION

STATEMENT OF INCOME AND EXPENDITURES

FOR THE PERIOD OF JULY 1, 1985 TO MARCH 31, 1986

INCOME	CASH ON HAND	INTEREST INCOME	FROM STATES	TOTAL REVENUE
Cash Balance 07-01-85	\$98,775.62	\$0.00	\$0.00	\$98,775.62
State of Idaho			\$42,000.00	\$42,000.00
State of Utah			\$42,000.00	\$42,000.00
State of Wyoming			\$42,000.00	\$42,000.00
Interest on Savings and other income		\$8,469.86		\$8,469.86
<hr/>				
TOTAL INCOME TO March 31, 1986	\$98,775.62	\$8,469.86	\$126,000.00	\$233,245.48

DEDUCT OPERATION EXPENSE

EXPENDED THROUGH U.S.G.S.

	APPROVED BUDGET	UNEXPENDED BALANCE	EXPENDITURES TO DATE
Stream Gaging	\$62,240.00	\$0.00	\$62,240.00
SUBTOTAL	\$62,240.00	\$0.00	\$62,240.00

EXPENDED THROUGH COMMISSION

Personal Services	\$8,600.00	\$5,691.23	\$2,908.77
Travel	\$400.00	\$400.00	\$0.00
Office Expenses & Supplies	\$200.00	-\$50.20	\$250.20
Treasurer Bond & Audit	\$500.00	\$500.00	\$0.00
Printing and Reproduction	\$2,300.00	\$105.00	\$2,195.00
Legal Consultant	\$500.00	\$0.00	\$500.00
Contract-Universities	\$36,120.00	\$36,120.00	\$0.00
SUBTOTAL	\$48,620.00	\$42,766.03	\$5,853.97

TOTAL	\$110,860.00	\$42,766.03	\$68,093.97
-------	--------------	-------------	-------------

CASH BALANCE AS OF 3-31-86			\$165,151.51
----------------------------	--	--	--------------

BRC2

BEAR RIVER COMMISSION INCOME / EXPENDITURE FORECAST THROUGH FY 88

DESCRIPTION	FY 85	FY 86	FY 87	FY 88	FY 89
INCOME					
BEGINNING BALANCE	\$115,591.65	\$98,775.62	\$123,860.62	\$98,160.62	\$143,990.62
IDAHO	\$29,000.00	\$42,000.00	\$42,000.00	\$42,000.00	\$42,000.00
UTAH	\$29,000.00	\$42,000.00	\$42,000.00	\$42,000.00	\$42,000.00
WYOMING	\$29,000.00	\$42,000.00	\$42,000.00	\$42,000.00	\$42,000.00
INTEREST ON SAVINGS	\$10,687.06	\$10,000.00	\$10,000.00	\$10,500.00	\$11,000.00
TOTAL INCOME	\$213,278.71	\$234,775.62	\$259,860.62	\$234,660.62	\$280,990.62
EXPENDITURES					
STREAM GAGING-U.S.G.S.	\$59,840.00	\$62,240.00	\$65,190.00	\$37,750.00	\$44,885.00
PERSONAL SERVICES	\$7,467.59	\$8,600.00	\$8,600.00	\$8,600.00	\$8,600.00
TRAVEL	\$0.00	\$400.00	\$400.00	\$400.00	\$400.00
OFFICE EXPENSES	\$32.00	\$200.00	\$200.00	\$200.00	\$200.00
TREASURE'S BOND & AUDIT	\$556.50	\$560.00	\$590.00	\$620.00	\$650.00
PRINTING & REPRODUCTION	\$949.00	\$100.00	\$100.00	\$100.00	\$100.00
PRINTING BIENNIAL REPORT	\$0.00	\$2,195.00	\$0.00	\$2,500.00	\$0.00
LEGAL CONSULTANT	\$508.00	\$500.00	\$500.00	\$500.00	\$500.00
CONTRACT-UNIVERSITIES	\$45,150.00	\$36,120.00	\$36,120.00	\$0.00	\$0.00
1976 DEPLETION STUDY	\$0.00	\$0.00	\$50,000.00	\$40,000.00	\$0.00
TOTAL EXPENDITURES	\$114,503.09	\$110,915.00	\$161,700.00	\$90,670.00	\$55,335.00
UNEXPENDED CASH BALANCE	\$98,775.62	\$123,860.62	\$98,160.62	\$143,990.62	\$225,655.62

* * * M E M O R A N D U M * * *

TO: Bear River Commission
RE: Depletion Map
DATE: April 7, 1986

Request was made by the Commission through a motion, to have the Engineering Committee define terms and ground rules along with a cost estimate of producing a Base Map using a Geographic Information System (GIS) approach using 1980 satellite data.

Attached you will find:

1. A summary of the standards and water use classifications that the committee would propose the commission adopt as guides for development of a final report.
2. A flow chart depicting a summary of tasks that will be preformed by the individual states or a conglomerate of the states along with a time chart depicting the probable schedule required to complete each task.
3. The budget needed to complete the project by state.

Logistically with the three states working as a committee, with the updated computer equipment which is becoming available to each state, the work that is preformed by each state

may change. The committee feels that these changes can be facilitated.

We as a committee appreciate the opportunity to work with the commission in resolving the issue of depletion covered in the Bear River Compact.

The Bear River Technical Advisory Committee has reviewed previous discussions and correspondence from previous committee members along with adding the input necessary to develop a reliable base map, using a GIS approach. The following is a consensus of committee members for the commissions discussion and action.

I) INPUT NECESSARY FOR DESIRED GRAPHIC DATA OUTPUT

- A. The Base Map will be generated using 1:100,000 scale 30 x 60 minute series maps.
- B. Delineation of basin, division and section boundaries will be done by each state.
- C. Review of boundaries to be done by all states.
(Using Type IV Study Bear River Basin as basis).
- D. The finished map product will differentiate uses with polygons or symbols and will identify the following, based on a 1976 base.
 1. Bear River Compact defined boundaries by basin, division and section.
 2. Irrigated acreage prior to January 1, 1976 date.
 3. Service areas for public water systems.
 4. Wetlands areas.
 5. Privately supplied uses greater than or equal to 0.1 cfs.
 6. Reservoir storage sites greater than 20 acre feet.

II) TABULAR DATA OUTPUT

The water rights perfected by each state will be accounted for and assigned to one of these four basic categories in order to calculate additional depletion.

1. Irrigated agriculture (include total acreage)
2. Public Supplies (all perfected rights post 1976 for which written information and/or samples, must by law, be submitted to public health authorities including all appropriations for commercial, domestic, industrial, mining, fossil fuel, geothermal, nuclear, municipal).
3. Private supplies (appropriations greater than or equal to 0.1 cfs for commercial, domestic, industrial, mining, fossil fuel, geothermal, nuclear).
4. Storage (all storage greater than 20 acre feet, including sewage treatment, irrigation, and power generation reservoirs).

All of the information will be compiled and stored in a manner allowing retrieval by:

- A. County
- B. Bear River Compact defined division and sections.
- C. Township, range and sections

Since the commission has opted to use 1980 landsat imagery as a basis for water use determination, the Engineering

Committee has investigated alternatives to remove acreage first irrigated sometime between 1976 and 1980. This change was evaluated to be very small and therefore the committee would recommend that these reductions be accomplished on a case by case basis using other geographic information (ie. aerial photography, water rights data, interviews).

Bear River Basin Mapping and Water
Use Data Collection Project

- Task 1: Review existing maps and reports for Bear River
(90 days) Basin. (all states)

- Task 2: Acquire all necessary satellite data, aerial
(110 days) photography, self and public supplied water
 information and map change, strata boundaries,
 municipal boundaries, etc. (all states)

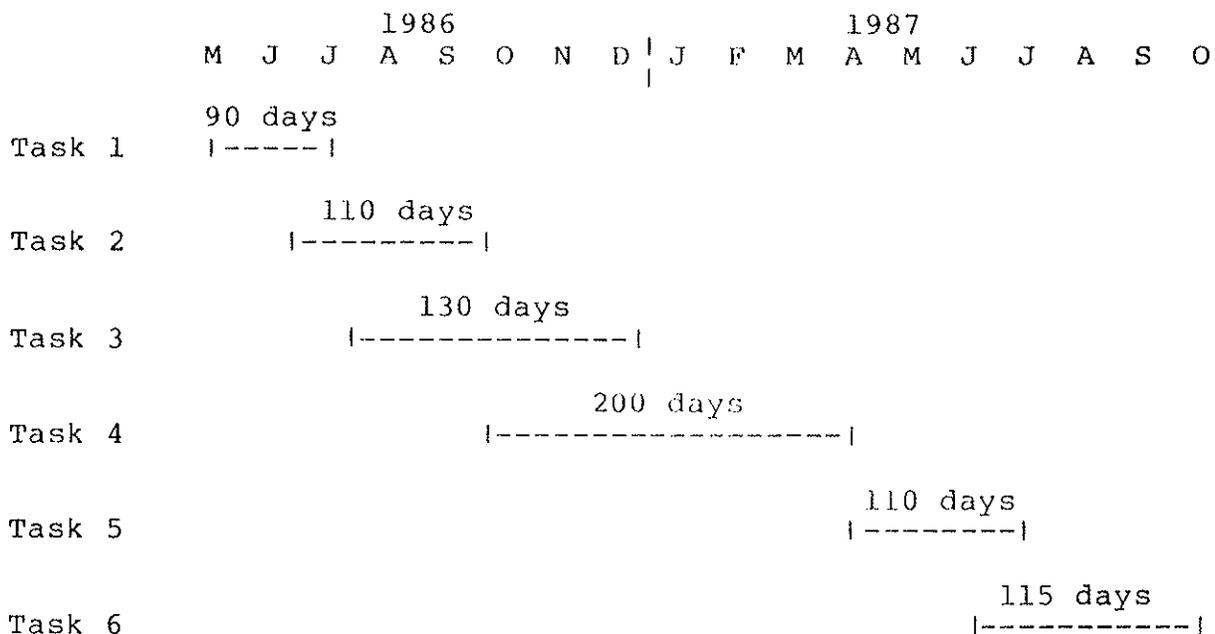
- Task 3: Produce computer readable files (digitize) for
(130 days) all necessary mapped data. (all states)

- Task 4: Develop Landsat irrigated lands classification.
(200 days) (Idaho, lead)

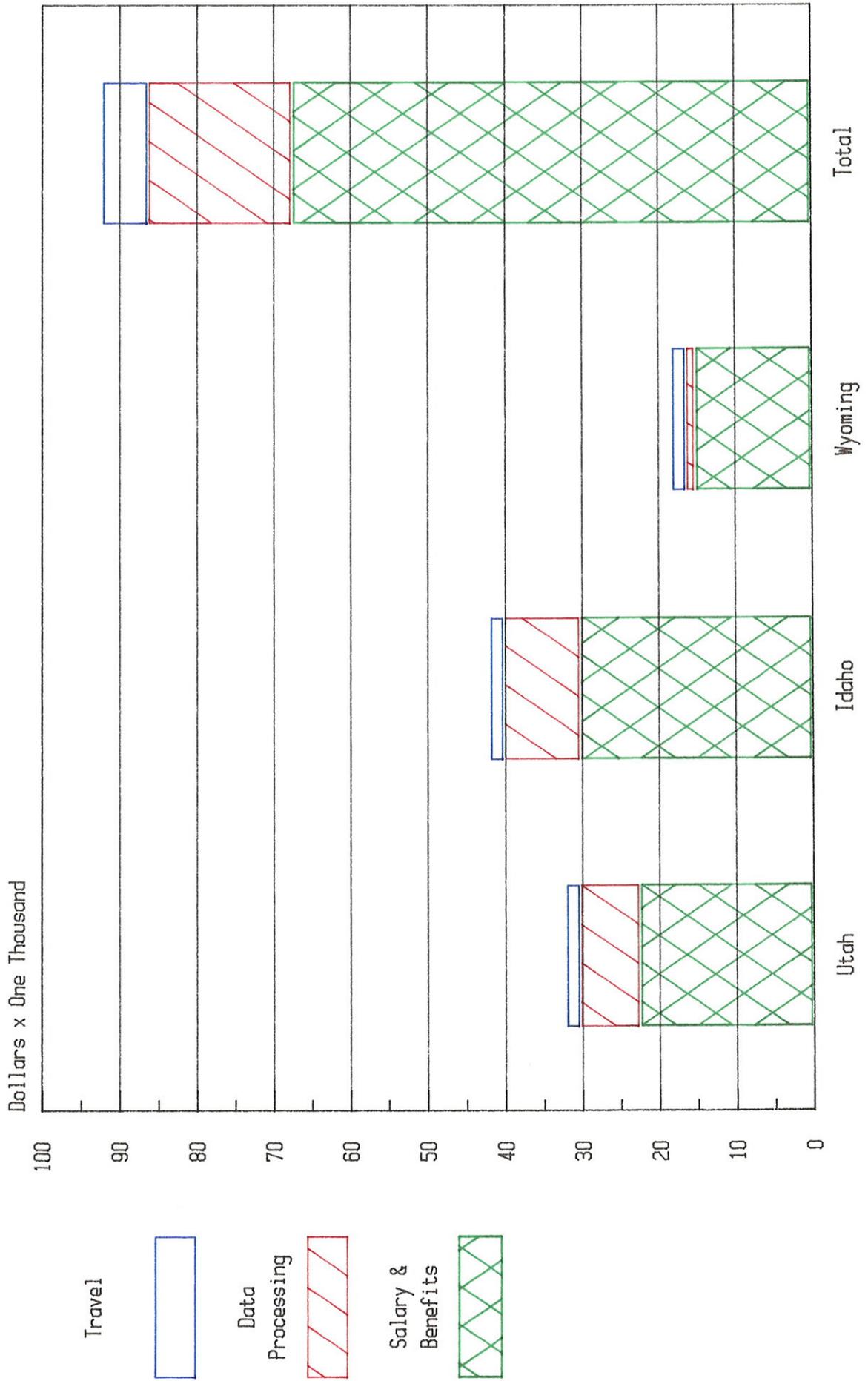
- Task 5: Overlay all computer readable map files (Task 3)
(110 days) with irrigated lands map from Task 4. (Idaho,
 Utah)

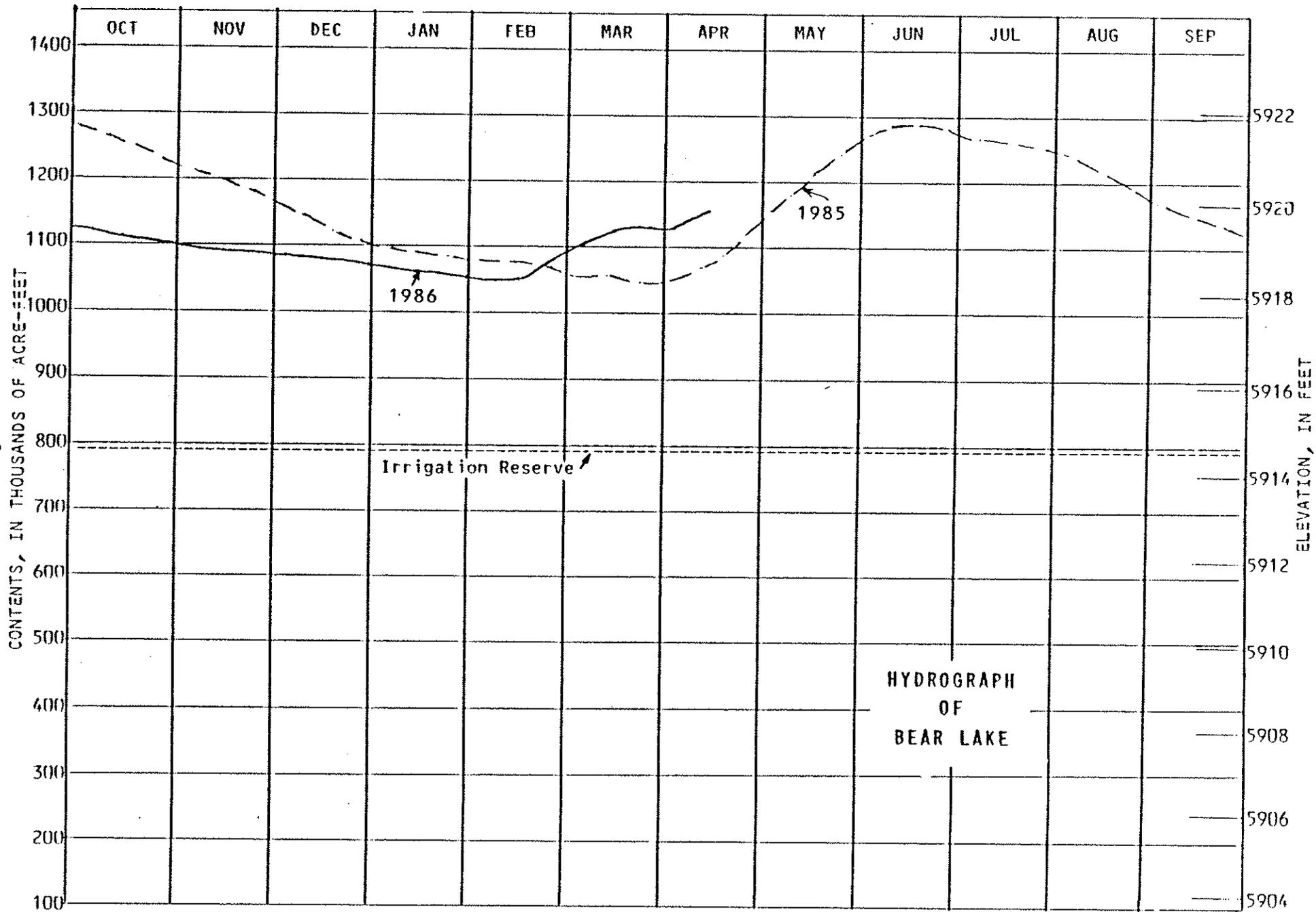
- Task 6: Output final map products and computer files of
(115 days) land water use by basin division and section.
 (Utah, lead)

- Bear River Basin Project Schedule -



Base Map Production Costs By State





BEAR RIVER COMMISSION BUDGET
AND ASSESSMENT
April 15, 1985
Revised April 21, 1986

	Fiscal Year Ending <u>6-30-86</u>	Fiscal Year Ending <u>6-30-87</u>	Fiscal Year Ending <u>6-30-88</u>	Fiscal Biennium Ending <u>6-30-88</u>
<u>BUDGET</u>				
<u>Compact Administration</u>				
Personal Service (Engr-Mgr) \$	8,600	\$ 8,600	\$ 8,600	\$ 17,200
Travel & Misc. (Engr-Mgr)	400	400	400	800
Office Supplies	200	200	200	400
Printing Biennial Report	2,195	0	2,500	2,500
Audit and Treasurer Bond	500	500	500	1,000
Printing and Reproduction	100	100	100	200
Legal Retainer and Fees	500	500	500	1,000
Depletion Studies (USU)	<u>36,120</u>	<u>36,120</u>	<u>0</u>	<u>36,120</u>
Subtotal \$	48,615	\$ 46,420	\$ 12,800	\$ 59,220
 <u>Stream-gaging Program</u>	 \$ <u>124,480</u>	 \$ <u>130,380</u> ✓	 \$ <u>75,500</u>	 \$ <u>205,880</u>
Total	\$ 173,095	\$ 176,800	\$ 88,300	\$ 265,100
 <u>Allocation of Budget</u>				
U.S. Geological Survey	\$ 62,240 ^{1985 W.Y.}	\$ 65,190 ^{1986 W.Y.} ✓	\$ 37,750 ^{1987 W.Y.}	\$ 102,940
Bear River Commission	\$ <u>110,855</u>	\$ <u>111,610</u>	\$ <u>50,550</u>	\$ <u>162,160</u>
Total	\$ 173,095	\$ 176,800	\$ 88,300	\$ 265,100

ASSESSMENT

Assessment to each State	\$ 42,000	\$ 42,000	\$ 42,000	\$ 84,000
Total three-State Assess.	\$ 126,000	\$ 126,000	\$ 126,000	\$ 252,000

State Assessment: Approved 4/13/84 for 1986 and 1987; 4/15/85 for 1988.

Stream Gaging: 1986 Fiscal Year, \$3,890/station (1985 Water Year)
1987 Fiscal Year, \$4,050/station (1986 W.Y.) plus \$780
to publish three records at Cutler.
1988 Fiscal Year, \$4,150/station (1987 W.Y.) plus \$800
to publish three records at Cutler.

APPLICATIONS TO APPROPRIATE WATER
BEAR RIVER DRAINAGE
STATE OF UTAH
10/23/85 to 04/01/86

Reported to Commission 4/21/86

WUC No.	Filing Date	Applicant	Source	Uses	Location	Quantity	S
25-8713	01/08/86	Best, Richard B.	Well	IDS	18 11N 1E	0.1	U
25-8714	01/23/86	Humphreys, Dale (c/o Dale Humphreys)	Parker Spring Stream	IS	23 11N 1E	0.1	U
25-8715	01/24/86	Covert, Freeman E.	Parker Spring	ISot	23 11N 1E	0.1	U
25-8719	02/10/86	Spendlove Enterprises c/o Reta Spendlove	Well	Dot	8 11N 1E	0.1	U
25-8721	03/05/86	Keller Grazing Corporation	Birch Spring	IDS	30 10N 2E	0.1	U
25-8722	03/05/86	Keller Grazing Corporation	Unnamed Spring	IDS	30 10N 2E	0.1	U
25-8724	03/11/86	Wheeler, Allan	Bear River	I	15 14N 1W	1.78	U
25-8731	03/17/86	City of Logan Light & Power	Logan River	Hy	28 12N 2E	36.0	U
29-3125	02/10/86	Belmont Springs Ltd Partnership (c/o Scott Ho	Unnamed Spring	Dot	23 13N 3W	0.5	U
29-3126	02/10/86	Belmont Springs Ltd Partnership (c/o Scott Ho	Unnamed Spring Area	IDot	14 13N 3W	0.1	U
29-3127	02/10/86	Belmont Springs Ltd Partnership (c/o Scott Ho	Unnamed Spring	IDot	23 13N 3W	0.1	U
29-3128	02/10/86	Belmont Springs Ltd Partnership (c/o Scott Ho	Unnamed Spring	IDot	23 13N 3W	0.1	U
29-3135	02/18/86	Pettingill, Gay W.	Well	IDS	11 7N 2W	0.445	U
29-3140	04/01/86	Grover, Curtis	Unnamed Springs (9) Res. Overf	IS	24 12N 3W	2.0	U

Total Surface Water, Utah: Approved, 00....Pending, 40.98 cfs

Total Ground Water, Utah: Approved, 00.... Pending, 0.64 cfs

STATE OF IDAHO

11-7356	2/20/86	SODA SPRINGS CITY	FORMATION SPRINGS	POWER	S28T8SR42E	CARIBOU	25.0 cfs P.
15-7101	10/2/85	DALE MOON	SPRING	IRRIG	S10T16SR36E	Oneida	0.5 APP

TOTAL SURFACE WATER, IDAHO: APPROVED, 0.5 CFS...PENDING, 25.0 CFS

CHANGE IN STATUS, PAST SIX MONTHS, OF PREVIOUSLY REPORTED APPLICATIONS

PENDING TO APPROVED: 2.92 CFS GROUND WATER AND 00 SURFACE WATER
APPROVED TO LAPSED OR RELINQUISHED: * 15.19 CFS GROUND WATER AND ** 28.52 CFS SURFACE WATER

* INCLUDES 8.92 CFS POWER USE

** INCLUDES 20.0 CFS POWER USE

WATER RIGHTS ACTION
BEAR RIVER DRAINAGE

STATE OF WYOMING

Bear River Adjudication

Permit Number	Date of Filing	Name	Source	Use	Location	(CFS) Amt.	Action
19933	October 31, 1944	Lynn A. & Richard H. Dimond	Bruner Creek, trib. Smith Fork, trib. Bear River	Irr.	Tr. 78, T24NR119W	0.46	Granted

Petition for Change in Use & Change in Point of Use

1213	May 14, 1896	Peter Danks Petitioner - City of Evanston	Bear River	to Mun. from Irr.	S17F15R120W	0.37	Granted
------	--------------	--	------------	----------------------	-------------	------	---------

TOTAL SURFACE WATER, WYOMING.....APPROVED 0.00...PENDING 0.00 cfs

TOTAL GROUND WATER, WYOMING.....APPROVED 0.00...PENDING 0.00 cfs

TOTAL GROUND WATER PREVIOUSLY SUBMITTED AS "APPROVED", NOW CANCELLED.....400.00 gpm (0.89 cfs)

TOTAL GROUND WATER PREVIOUSLY SUBMITTED AS "PENDING", NOW APPROVED..... 25.00 gpm (0.056 cfs)

TOTAL GROUND WATER PREVIOUSLY SUBMITTED AS "PENDING", NOW CANCELLED.....900.00 gpm (2.005 cfs)

TOTAL GROUND WATER PREVIOUSLY SUBMITTED AS "PENDING", NOW REJECTED..... 16.40 gpm (0.037 cfs)

TOTAL ADJUDICATED SURFACE WATER RIGHTS..... 0.46 cfs

APRIL 1986 ENGINEERING COMMITTEE RECOMMENDATIONS *AS APPROVED IN APR 86 MEETING*

NO. SITES DIRECTLY NEEDED (13 Stations - 9 Funded by Commission)

011500	1	Bear River near Utah-Wyoming Line
001570	2	Sulphur Creek above Sulphur Creek Reservoir
001590	3	Sulphur Creek below Sulphur Creek Reservoir
002010	4	Bear River above Woodruff Narrows Reservoir
020200	5	Woodruff Narrows Reservoir
020300	6	Bear River below Woodruff
028500	7	Bear River below Pixley Dam
038000	8	Bear River below Smiths Fork
039500	9	Bear River at Border
046000		Rainbow Inlet Canal*
046500		Bear River below Stewart Dam*
055500		Bear Lake at Lifton*
059500		Bear Lake Outlet Canal*

SITES INDIRECTLY NEEDED (15 Stations - 8 Funded by Commission)

026500	10	Bear River near Randolph
032000	11	Smiths Fork near Border
041000	12	Thomas Fork near Wyoming-Idaho Line
044000		Bear River at Harer*
068500	13	Bear River at Pescadero
075000		Bear River near Soda Springs*
079500		Bear River at Alexander*
086500		Bear River below Oneida*
092700	14	Bear River at Idaho-Utah Line
117000		Hammond (East Side) Canal*
117500		West Side Canal*
118000		Bear River near Collingston*
108400	15	Logan, Hyde Park & Smithfield Canal
109000	16	Logan River above State Dam
126000	17	Bear River near Corinne

SITES NOT TO BE FUNDED BY BEAR RIVER COMMISSION (15 Stations)

010400	East Fork Bear River near Evanston
011200	West Fork Bear River below Whitney Reservoir
011400	West Fork Bear River below Deer Creek
001950	Chapman Canal at State Line
020900	Woodruff Creek below Woodruff Creek Reservoir
058600	Bloomington Creek above Div.
072800	Eight Mile Creek near Soda Springs
076400	Soda Creek at Five Mile Meadow
084500	Cottonwood Creek near Cleveland
090500	Bear River near Preston
093000	Cub River near Preston
104700	Little Bear River below Davenport Creek
104900	East Fork Little Bear River above Porcupine
106000	Little Bear River near Paradise
103500	Blacksmith Fork near Hyrum

* Supported by Utah Power & Light Co.

NOVEMBER 1985 ENGINEERING COMMITTEE RECOMMENDATIONS

<u>NO.</u>	<u>SITES DIRECTLY NEEDED</u>
011500 1	Bear River near Utah-Wyoming Line
001570 2	Sulphur Creek above Sulphur Creek Reservoir
001590 3	Sulphur Creek below Sulphur Creek Reservoir
001950 4	Chapman Canal at State Line
002010 5	Bear River above Woodruff Narrows Reservoir
020200 6	Woodruff Narrows Reservoir
020300 7	Bear River below Woodruff
028500 8	Bear River below Pixley Dam
039500 9	Bear River at Border
046000	Rainbow Inlet Canal*
046500	Bear River below Stewart Dam*
055500	Bear Lake at Lifton*
059500	Bear Lake Outlet Canal*

SITES INDIRECTLY NEEDED (Needed for at least a regional stream flow indicator)

026500 10	Bear River near Randolph
032000 11	Smiths Fork near Border
041000 12	Thomas Fork near Wyoming-Idaho Line
044000	Bear River at Harer*
068500 13	Bear River at Pescadero
075000	Bear River near Soda Springs*
079500	Bear River at Alexander*
086500	Bear River below Oneida*
092700 14	Bear River at Idaho-Utah Line
117000	Hammond (East Side) Canal*
117500	West Side Canal*
118000	Bear River near Collingston*
108400 15	Logan, Hyde Park & Smithfield Canal
109000 16	Logan River above State Dam
126000 17	Bear River near Corinne

SITES NOT NEEDED (or to be gaged and reported by others)

010400	East Fork Bear River near Evanston
011200	West Fork Bear River below Whitney Reservoir
011400	West Fork Bear River below Deer Creek
020900	Woodruff Creek below Woodruff Creek Reservoir
038000 ?	Bear River below Smiths Fork
058600	Bloomington Creek above Div.
072800	Eight Mile Creek near Soda Springs
076400	Soda Creek at Five Mile Meadow
084500	Cottonwood Creek near Cleveland
090500	Bear River near Preston
093000	Cub River near Preston
104700	Little Bear River below Davenport Creek
104900	East Fork Little Bear River above Porcupine
106000	Little Bear River near Paradise
103500	Blacksmith Fork near Hyrum

* Supported by Utah Power & Light Co.

* * * M E M O R A N D U M * * *

TO: Bear River Commission
RE: Depletion Map
DATE: April 7, 1986

Request was made by the Commission through a motion, to have the Engineering Committee define terms and ground rules along with a cost estimate of producing a Base Map using a Geographic Information System (GIS) approach using 1980 satellite data.

Attached you will find:

1. A summary of the standards and water use classifications that the committee would propose the commission adopt as guides for development of a final report.
2. A flow chart depicting a summary of tasks that will be preformed by the individual states or a conglomerate of the states along with a time chart depicting the probable schedule required to complete each task.
3. The budget needed to complete the project by state.

Logistically with the three states working as a committee, with the updated computer equipment which is becoming available to each state, the work that is preformed by each state

may change. The committee feels that these changes can be facilitated.

We as a committee appreciate the opportunity to work with the commission in resolving the issue of depletion covered in the Bear River Compact.

The Bear River Technical Advisory Committee has reviewed previous discussions and correspondence from previous committee members along with adding the input necessary to develop a reliable base map, using a GIS approach. The following is a consensus of committee members for the commissions discussion and action.

I) INPUT NECESSARY FOR DESIRED GRAPHIC DATA OUTPUT

- A. The Base Map will be generated using 1:100,000 scale 30 x 60 minute series maps.
- B. Delineation of basin, division and section boundaries will be done by each state.
- C. Review of boundaries to be done by all states.
(Using Type IV Study Bear River Basin as basis).
- D. The finished map product will differentiate uses with polygons or symbols and will identify the following, based on a 1976 base.
 - 1. Bear River Compact defined boundaries by basin, division and section.
 - 2. Irrigated acreage prior to January 1, 1976 date.
 - 3. Service areas for public water systems.
 - 4. Wetlands areas.
 - 5. Privately supplied uses greater than or equal to 0.1 cfs.
 - 6. Reservoir storage sites greater than 20 acre feet.

II) TABULAR DATA OUTPUT

The water rights perfected by each state will be accounted for and assigned to one of these four basic categories in order to calculate additional depletion.

1. Irrigated agriculture (include total acreage)
2. Public Supplies (all perfected rights post 1976 for which written information and/or samples, must by law, be submitted to public health authorities including all appropriations for commercial, domestic, industrial, mining, fossil fuel, geothermal, nuclear, municipal).
3. Private supplies (appropriations greater than or equal to 0.1 cfs for commercial, domestic, industrial, mining, fossil fuel, geothermal, nuclear).
4. Storage (all storage greater than 20 acre feet, including sewage treatment, irrigation, and power generation reservoirs).

All of the information will be compiled and stored in a manner allowing retrieval by:

- A. County
- B. Bear River Compact defined division and sections.
- C. Township, range and sections

Since the commission has opted to use 1980 landsat imagery as a basis for water use determination, the Engineering

Committee has investigated alternatives to remove acreage first irrigated sometime between 1976 and 1980. This change was evaluated to be very small and therefore the committee would recommend that these reductions be accomplished on a case by case basis using other geographic information (ie. aerial photography, water rights data, interviews).

Bear River Basin Mapping and Water
Use Date Collection Project

- Task 1: Review existing maps and reports for Bear River
(90 days) Basin. (all states)

- Task 2: Acquire all necessary satellite data, aerial
(110 days) photography, self and public supplied water
 information and map change, strata boundaries,
 municipal boundaries, etc. (all states)

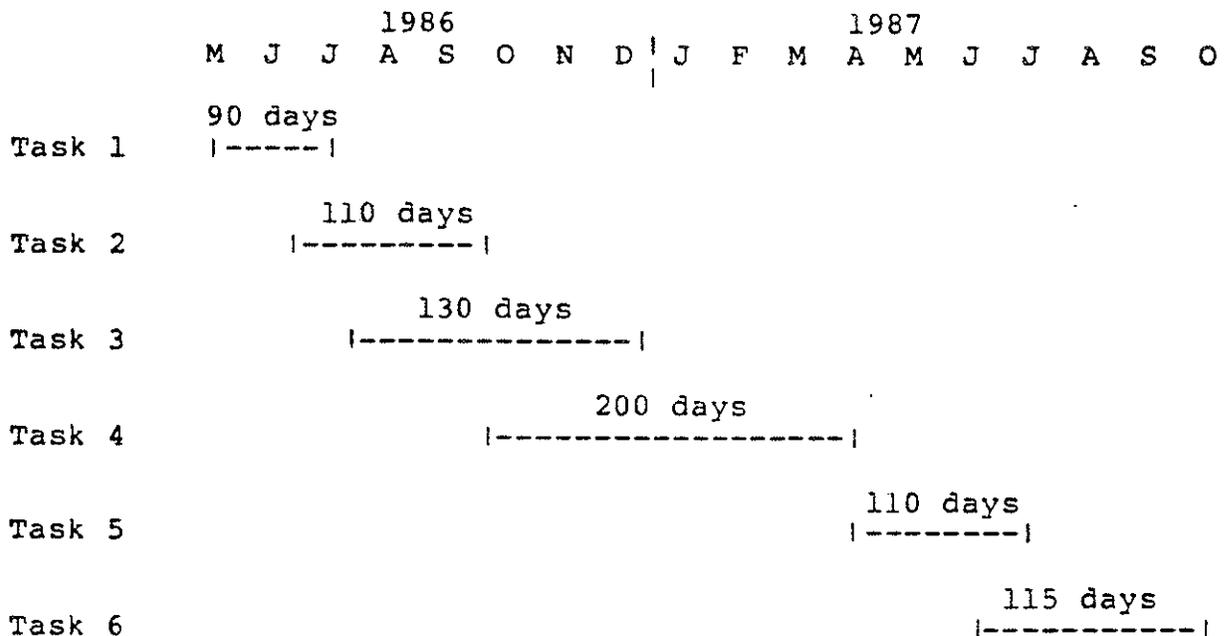
- Task 3: Produce computer readable files (digitize) for
(130 days) all necessary mapped data. (all states)

- Task 4: Develop Landsat irrigated lands classification.
(200 days) (Idaho, lead)

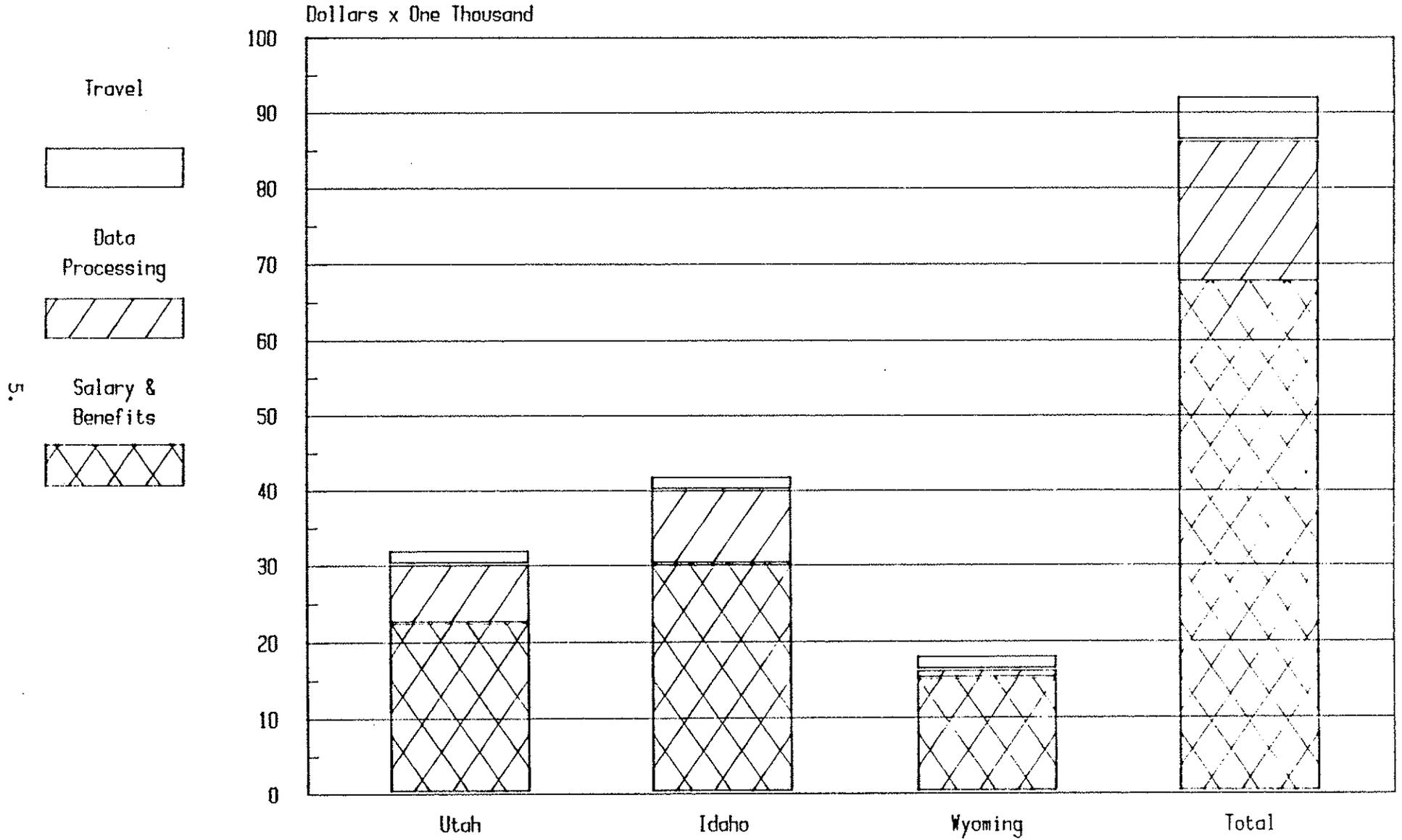
- Task 5: Overlay all computer readable map files (Task 3)
(110 days) with irrigated lands map from Task 4. (Idaho,
 Utah)

- Task 6: Output final map products and computer files of
(115 days) land water use by basin division and section.
 (Utah, lead)

- Bear River Basin Project Schedule -



Base Map Production Costs By State



April 17, 1986

Duty of Water Under Bear River Compact:
Field Verification of Empirical Methods

A Three State Cooperative Project Sponsored by the Bear River Commission.

University of Idaho	Utah State University	University of Wyoming
Ag. Engineering	Ag. & Irr. Engineering	Ag. Engineering
C.E. Brockway	R.W. Hill	R.D. Burman
R.G. Allen	(Project Coordinator)	

Research Status Report

Weather data and lysimeter water use information have been obtained for 1983, 1984 and 1985 at three sites along the Bear River, Montpelier, ID; Randolph, UT and Hilliard, WY. Weather data was also collected for 1982 at all three sites. Consumptive use for a few adjacent alfalfa fields has been estimated using a neutron probe to measure soil moisture depletions on a weekly basis.

The weather data includes daily maximum and minimum air temperatures, relative humidity, solar radiation, wind travel and precipitation. This data allows the use of a number of empirical equations to calculate consumptive water use. Measured evapotranspiration (ET) on the lysimeters are being used to calibrate and verify the empirical methods of calculating consumptive use.

The preliminary results show that the modified Penman equation seems to match seasonal ET variations better than the SCS Blaney-Criddle method. However, there is not sufficient historical climatic data available to use the Penman equation on a long term basis.

Because of the time required for the meadow grass to establish in the lysimeters and the variation in the weather patterns during the past few years, the objectives of the study may be more fully accomplished with another year or two of data collection.

Analysis of Lysimeter Data

The monthly measured lysimeter water use averaged for each site during the three years of the study is presented in Figure 1. Monthly and seasonal totals of lysimeter water use are given in Table 1 for May 15 - October 15 of 1983 - 1985 at each site.

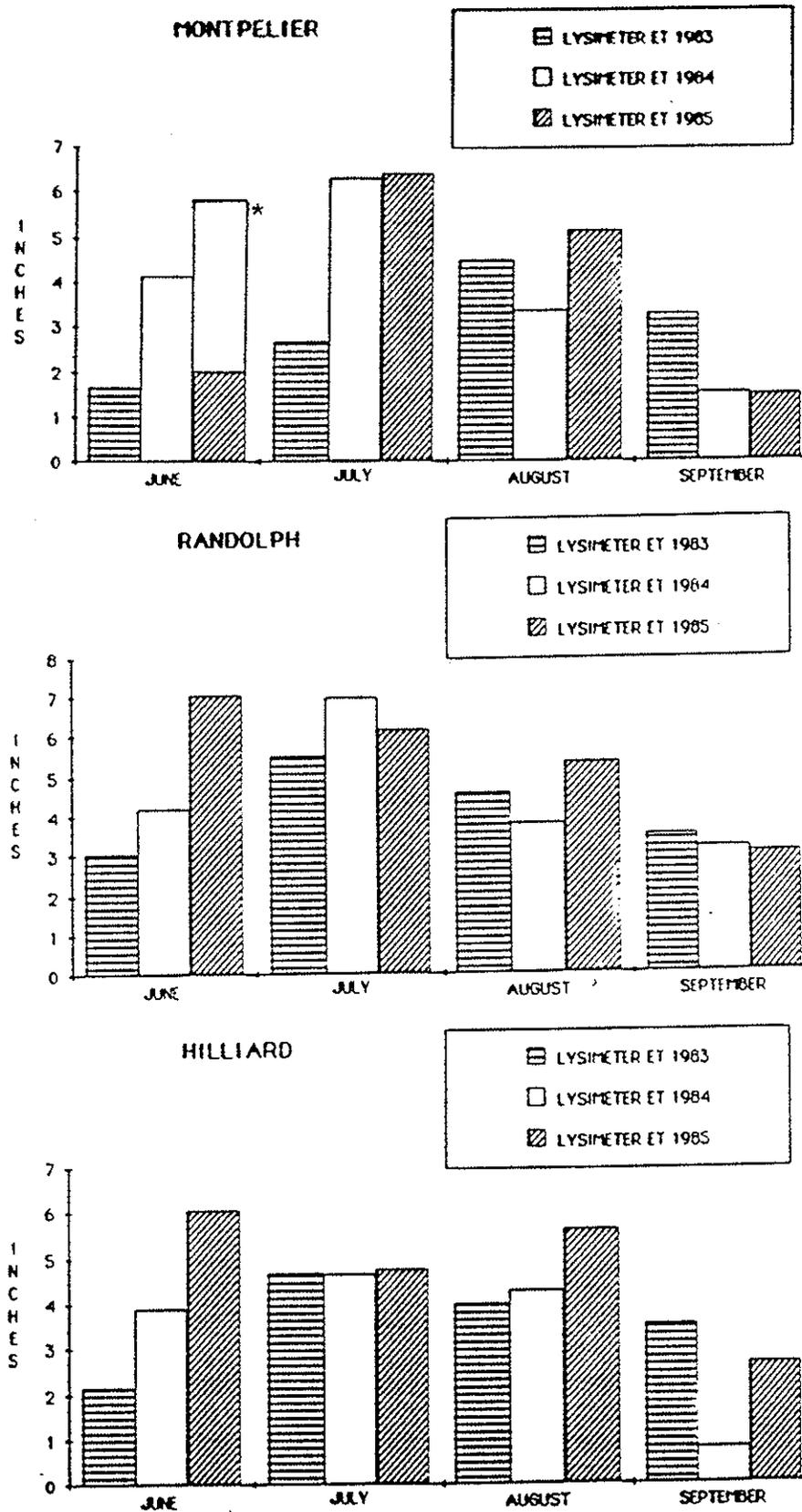


Figure 1. Monthly measured lysimeter water use at Montpelier, Idaho; Randolph, Utah and Hilliard, Wyoming for 1983, 1984 and 1985.

*Value for Montpelier, June 1985, adjusted to correlate with other two sites.

TABLE 1. MONTHLY MEASURED AND CALCULATED ET AND COEFFICIENTS
 FOR MONTPELIER, ID., RANDOLPH, UT. AND HILLIARD, WY.
 FROM LYSIMETERS WITH MEADOW GRASS.

		MEASURED MONTHLY ET FROM LYSIMETERS				SEASONAL TOTAL MAY 15-OCT 15
		JUN	JUL	AUG	SEP	
MONTPELIER	1983	1.65	2.69	4.44	3.27	12.99
MONTPELIER	1984	4.10	6.42	3.35	1.55	18.02
MONTPELIER	1985	5.79	6.38	5.12	1.48	21.03
RANDOLPH	1983	3.06	5.49	4.58	3.50	16.98
RANDOLPH	1984	4.21	6.96	3.75	3.18	21.12
RANDOLPH	1985	7.06	6.14	5.30	3.04	25.26
HILLIARD	1983	2.16	4.66	3.97	3.52	14.82
HILLIARD	1984	3.89	4.62	4.32	0.80	16.33
HILLIARD	1985	6.03	4.72	5.59	2.64	20.76

BEAR RIVER COMMISSION
880 River Heights Blvd.
Logan, Utah 84321

April 21, 1986

Engineer-Mgr Report

Wallace N. Jibson

1986 Water Supply and Compact Operation

Water Supply

Seasonal streamflow is expected to be well above average in all areas of Bear River basin according to snow measurements made at the end of March. This represents about a nine-percent decline from March 1 forecasts. Irrigators in Wyoming and Idaho who are dependent on Smiths Fork runoff will welcome the expected increase from 82 percent in 1985 to 126 percent in 1986. The Upper Bear and Logan River are expected to yield 127 percent and 133 percent respectively of the 1961-80 average for the April-July period.

The following table shows a comparison of measured runoff in 1984 and 1985 with that being forecast for 1986 and with the 1961-80 (20-year) average. This updated base period includes the dry 1961 season and gives a slightly lower average than in the previous base period.

Streamflow in Acre-Feet

	<u>April-July</u>				Forecast as
	Average 1961-80	Measured 1984	Measured 1985	Forecast 1986	Percent of Average
Upper Bear	110,000	162,000	123,400	140,000	127%
Smiths Fork	119,000*	165,500*	97,100*	151,000*	126%
Logan River	116,000	212,000	123,300	155,000	133%

* April-September

Reservoirs

Winter draft from Bear Lake (See page 3) was somewhat less than in recent years, but the warm and wet spell in February caused a sharp upturn about six weeks ahead of the usual pattern that would have dropped the Lake surface to about 5,918 feet by the last of March. Instead, by mid-April the Lake surface was at 5,919.89 feet elevation with content of 1,157,000 acre-feet. Inflow through the Rainbow Canal on April 14 was 1,960 cfs with the Outlet Canal discharging 1,040 cfs.

Woodruff Narrows and Woodruff Creek Reservoirs have been spilling (March 10) with Sulphur Creek about three feet below spillway at that time. Extremely high runoff occurred earlier in the channel below Hyrum Reservoir, and Porcupine Reservoir was almost full at the last observation.

Budget

Changing the end of the fiscal year to June 30 requires payment of the 1986 water-year obligation from the 1987 fiscal-year budget. Cost per gaging station changes each year, so the budgeted amount for stream gaging in 1987 will not agree with the 1986 water-year obligation due to be paid September 30, 1986.

I have discussed with Bert Page some alternatives and it is our recommendation that the current fiscal-year budget should include the previous water-year allocation for stream gaging. Thus, the 1987 fiscal-year budget for stream gaging will equal the amount in the 1986 water-year agreement with the USGS.

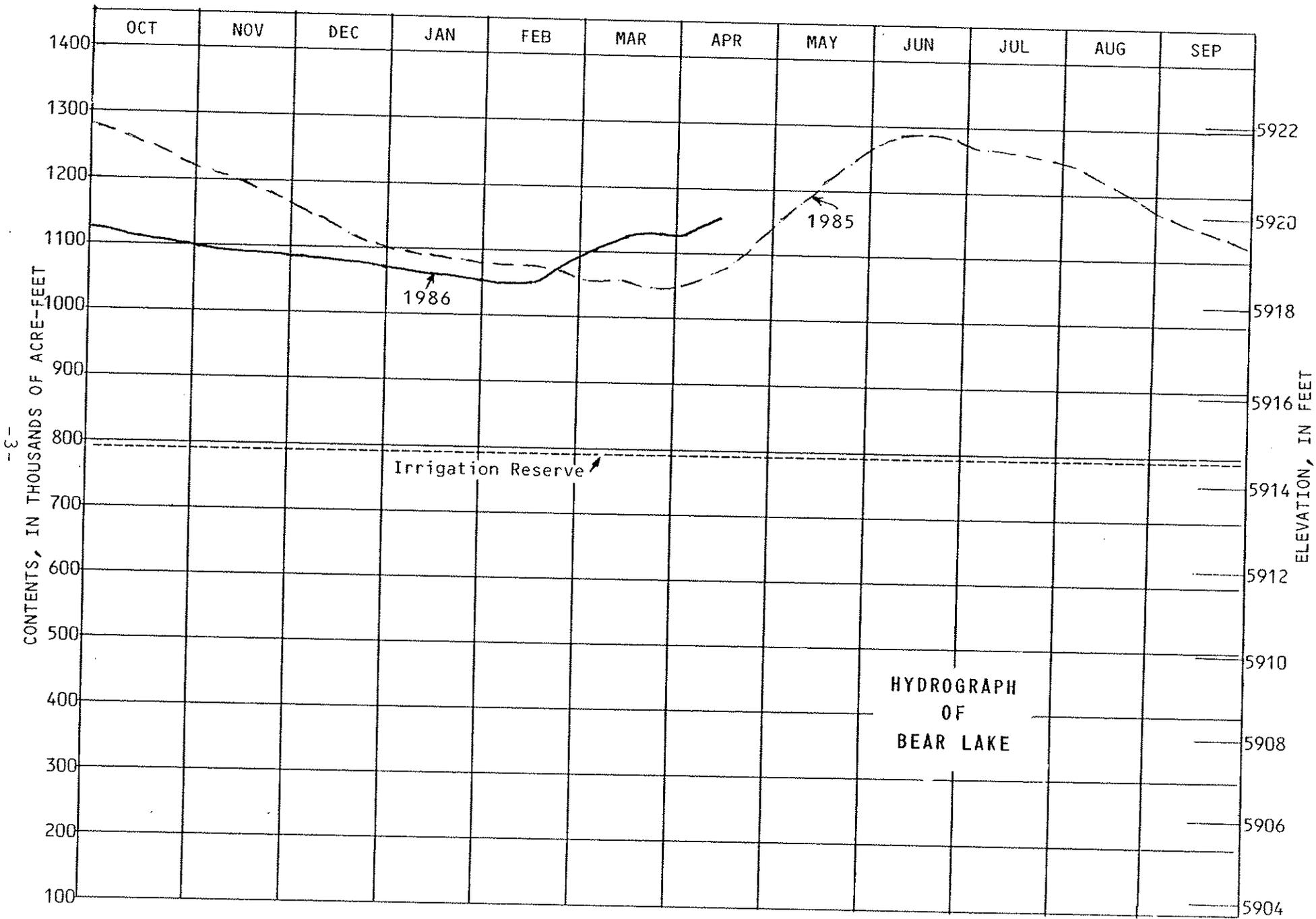
Previously approved budget estimates for fiscal years 1986 through 1988 have been revised for your consideration (See page 4), not only to incorporate the above recommendation but to include three other significant changes, two of which are on the agenda for action today. First, the cost of printing the Biennial Report is moved ahead to the fiscal year in which payment is made rather than in the year that the charges are incurred. This change is for auditing purposes. Second, because of the recommendation of the depletion study team (Bob Hill), I have extended this study for one more year at the same cost as in the previous years. And third, for the 1987 water year (1988 fiscal year) I have arbitrarily budgeted for 18 gaging stations rather than the usual 32. Included would be 17 sites recommended by the Engineering Committee last November plus Bear River below Smiths Fork, one of the four questionable stations mentioned in a motion approved in November.

Ted Arnow has given us a firm figure for the 1987 water-year program of \$4,150 per gaging station plus a total of \$800 (\$400 each side) to continue publishing the three records at Cutler Dam. Again, I am not recommending 18 or any other number of gaging stations but have included this number in the fiscal year ending 6-30-88 for comparative purposes. It is interesting to note that the reduction in stream gaging approximately offsets in one year the addition of one more year in the depletion study. Also of interest is that the three-year total assessment to the States of \$378,000 compares to a three-year budget estimate of \$273,015 which leaves a balance in excess of \$100,000 for a base map and depletion determination to implement administration of the Amended Compact.

Consideration of these proposed revisions in budgets that have been previously approved should await other actions of the Commission today.

Applications for Appropriation

Again, only a few applications for appropriation have been reported by the State Engineers for the past six months. These are summarized on the last two pages of the report.



-3-

CONTENTS, IN THOUSANDS OF ACRE-FEET

ELEVATION, IN FEET

HYDROGRAPH
OF
BEAR LAKE

Irrigation Reserve

1986

1985

OCT

NOV

DEC

JAN

FEB

MAR

APR

MAY

JUN

JUL

AUG

SEP

1400

1300

1200

1100

1000

900

800

700

600

500

400

300

200

100

5922

5920

5918

5916

5914

5912

5910

5908

5906

5904

BEAR RIVER COMMISSION BUDGET
AND ASSESSMENT

April 15, 1985

Revised April 21, 1986

	Fiscal Year Ending <u>6-30-86</u>	Fiscal Year Ending <u>6-30-87</u>	Fiscal Year Ending <u>6-30-88</u>	Fiscal Biennium Ending <u>6-30-88</u>
<u>BUDGET</u>				
<u>Compact Administration</u>				
Personal Service (Engr-Mgr) \$	8,600	\$ 8,600	\$ 8,600	\$ 17,200
Travel & Misc. (Engr-Mgr)	400	400	400	800
Office Supplies	200	200	200	400
Printing Biennial Report	2,195	0	2,500	2,500
Audit and Treasurer Bond	500	500	500	1,000
Printing and Reproduction	100	100	100	200
Legal Retainer and Fees	500	500	500	1,000
Depletion Studies (USU)	<u>36,120</u>	<u>36,120</u>	<u>0</u>	<u>36,120</u>
Subtotal \$	48,615	\$ 46,420	\$ 12,800	\$ 59,220
<u>Stream-gaging Program</u>	\$ <u>124,480</u>	\$ <u>130,380</u>	\$ <u>75,500</u>	\$ <u>205,880</u>
Total \$	173,095	\$ 176,800	\$ 88,300	\$ 265,100
<u>Allocation of Budget</u>				
U.S. Geological Survey	\$ 62,240	\$ 65,190	\$ 37,750	\$ 102,940
Bear River Commission	\$ <u>110,855</u>	\$ <u>111,610</u>	\$ <u>50,550</u>	\$ <u>162,160</u>
Total \$	173,095	\$ 176,800	\$ 88,300	\$ 265,100
<u>ASSESSMENT</u>				
Assessment to each State	\$ 42,000	\$ 42,000	\$ 42,000	\$ 84,000
Total three-State Assess.	\$ 126,000	\$ 126,000	\$ 126,000	\$ 252,000

State Assessment: Approved 4/13/84 for 1986 and 1987; 4/15/85 for 1988.

Stream Gaging: 1986 Fiscal Year, \$3,890/station (1985 Water Year)
 1987 Fiscal Year, \$4,050/station (1986 W.Y.) plus \$780
 to publish three records at Cutler.
 1988 Fiscal Year, \$4,150/station (1987 W.Y.) plus \$800
 to publish three records at Cutler.

APPLICATIONS TO APPROPRIATE WATER
BEAR RIVER DRAINAGE
STATE OF UTAH
10/23/85 to 04/01/86

Reported to Commission 4/21/86

WUC No.	Filing Date	Applicant	Source	Uses	Location	Quantity	S
25-8713	01/08/86	Best, Richard B.	Well	IDS	18 11N 1E	0.1	U
25-8714	01/23/86	Humphreys, Dale (c/o Dale Humphreys)	Parker Spring Stream	IS	23 11N 1E	0.1	U
25-8715	01/24/86	Covert, Freeman E.	Parker Spring	ISot	23 11N 1E	0.1	U
25-8719	02/10/86	Spendlove Enterprises c/o Reta Spendlove	Well	DOT	8 11N 1E	0.1	U
25-8721	03/05/86	Keller Grazing Corporation	Birch Spring	IDS	30 10N 2E	0.1	U
25-8722	03/05/86	Keller Grazing Corporation	Unnamed Spring	IDS	30 10N 2E	0.1	U
25-8724	03/11/86	Wheeler, Allan	Bear River	I	15 14N 1W	1.78	U
25-8731	03/17/86	City of Logan Light & Power	Logan River	Hy	28 12N 2E	36.0	U
29-3125	02/10/86	Belmont Springs Ltd Partnership (c/o Scott Ho	Unnamed Spring	DOT	23 13N 3W	0.5	U
29-3126	02/10/86	Belmont Springs Ltd Partnership (c/o Scott Ho	Unnamed Spring Area	IDot	14 13N 3W	0.1	U
29-3127	02/10/86	Belmont Springs Ltd Partnership (c/o Scott Ho	Unnamed Spring	IDot	23 13N 3W	0.1	U
29-3128	02/10/86	Belmont Springs Ltd Partnership (c/o Scott Ho	Unnamed Spring	IDot	23 13N 3W	0.1	U
29-3135	02/18/86	Pettingill, Gay W.	Well	IDS	11 7N 2W	0.445	U
29-3140	04/01/86	Grover, Curtis	Unnamed Springs (9) Res. Overf	IS	24 12N 3W	2.0	U

Total Surface Water, Utah: Approved, 00....Pending, 40.98 cfs
 Total Ground Water, Utah: Approved, 00.... Pending, 0.64 cfs

STATE OF IDAHO

11-7356	2/20/86	SODA SPRINGS CITY	FORMATION SPRINGS	POWER	S28T8SR42E	CARIBOU	25.0 cfs P.
15-7101	10/2/85	DALE MOON	SPRING	IRRIG	S10T16SR36E	Oneida	0.5 APP

TOTAL SURFACE WATER, IDAHO: APPROVED, 0.5 CFS...PENDING, 25.0 CFS

CHANGE IN STATUS, PAST SIX MONTHS, OF PREVIOUSLY REPORTED APPLICATIONS

PENDING TO APPROVED: 2.92 CFS GROUND WATER AND 00 SURFACE WATER

APPROVED TO LAPSED OR RELINQUISHED: * 15.19 CFS GROUND WATER AND ** 28.52 CFS SURFACE WATER

* INCLUDES 8.92 CFS POWER USE

** INCLUDES 20.0 CFS POWER USE

WATER RIGHTS ACTION
BEAR RIVER DRAINAGE

STATE OF WYOMING

Bear River Adjudication

Permit Number	Date of Filing	Name	Source	Use	Location	(CFS) Amt.	Action
19933	October 31, 1944	Lynn A. & Richard H. Dimond	Bruner Creek, trib. Smith Fork, trib. Bear River	Irr.	Tr. 78, T24NR119W	0.46	Granted
Petition for Change in Use & Change in Point of Use							
1213	May 14, 1896	Peter Danks Petitioner - City of Evanston	Bear River	to Mun. from Irr.	S17T15R120W	0.37	Granted

TOTAL SURFACE WATER, WYOMING.....APPROVED 0.00...PENDING 0.00 cfs

TOTAL GROUND WATER, WYOMING.....APPROVED 0.00...PENDING 0.00 cfs

TOTAL GROUND WATER PREVIOUSLY SUBMITTED AS "APPROVED", NOW CANCELLED.....400.00 gpm (0.89 cfs)

TOTAL GROUND WATER PREVIOUSLY SUBMITTED AS "PENDING", NOW APPROVED..... 25.00 gpm (0.056 cfs)

TOTAL GROUND WATER PREVIOUSLY SUBMITTED AS "PENDING", NOW CANCELLED.....900.00 gpm (2.005 cfs)

TOTAL GROUND WATER PREVIOUSLY SUBMITTED AS "PENDING", NOW REJECTED..... 16.40 gpm (0.037 cfs)

TOTAL ADJUDICATED SURFACE WATER RIGHTS..... 0.46 cfs

BEAR RIVER COMMISSION

STATEMENT OF INCOME AND EXPENDITURES

FOR THE PERIOD OF JULY 1, 1985 TO MARCH 31, 1986

INCOME	CASH ON HAND	INTEREST INCOME	FROM STATES	TOTAL REVENUE
Cash Balance 07-01-85	\$98,775.62	\$0.00	\$0.00	\$98,775.62
State of Idaho			\$42,000.00	\$42,000.00
State of Utah			\$42,000.00	\$42,000.00
State of Wyoming			\$42,000.00	\$42,000.00
Interest on Savings and other income		\$8,469.86		\$8,469.86
<hr/>				
TOTAL INCOME TO March 31, 1986	\$98,775.62	\$8,469.86	\$126,000.00	\$233,245.48

DEDUCT OPERATION EXPENSE

EXPENDED THROUGH U.S.G.S.

	APPROVED BUDGET	UNEXPENDED BALANCE	EXPENDITURES TO DATE
Stream Gaging	\$62,240.00	\$0.00	\$62,240.00
SUBTOTAL	\$62,240.00	\$0.00	\$62,240.00

EXPENDED THROUGH COMMISSION

Personal Services	\$8,600.00	\$5,691.23	\$2,908.77
Travel	\$400.00	\$400.00	\$0.00
Office Expenses & Supplies	\$200.00	-\$50.20	\$250.20
Treasurer Bond & Audit	\$500.00	\$500.00	\$0.00
Printing and Reproduction	\$2,300.00	\$105.00	\$2,195.00
Legal Consultant	\$500.00	\$0.00	\$500.00
Contract-Universities	\$36,120.00	\$36,120.00	\$0.00
SUBTOTAL	\$48,620.00	\$42,766.03	\$5,853.97

TOTAL	\$110,860.00	\$42,766.03	\$68,093.97
-------	--------------	-------------	-------------

CASH BALANCE AS OF 3-31-86			\$165,151.51
----------------------------	--	--	--------------

BEAR RIVER COMMISSION

DETAILS OF EXPENDITURES

FOR PERIOD ENDING MARCH 31, 1986

125	VanCott, Bagley	\$500.00
126	Void	\$0.00
127	Wally Jibson	\$1,181.97
128	Rose Printing	\$2,195.00
129	Wally Jibson	\$671.79
130	USGS	\$62,240.00
131	Utah State Treasurer	\$50,000.00
132	Creative Awards by Lane	\$231.52
133	Wally Jibson	\$1,055.01
134	Void	\$0.00
-	Bank Charges	\$18.68

		\$118,093.97
	Less Savings Account	\$50,000.00

	Total Expenses	\$68,093.97

BANK RECONCILIATION

March 31, 1985

Cash in Bank per Statement 04-01-85	\$34,247.94
Less: Outstanding Checks	\$0.00

Total Cash in Bank	\$34,247.94
Plus: Savings Account-Utah State Treasurer	\$130,903.57

TOTAL CASH IN SAVINGS AND IN CHECKING ACCOUNT	\$165,151.51
