

[Chairman: Mr. Kowalski]

[10:04 a.m.]

MR. CHAIRMAN: Good morning, ladies and gentlemen. I have been informed this morning that there's a difficulty with the time clock in this room. It really is 10 o'clock, so I'm advised. It may even be a minute or two past. If there are clock-watchers here — and of course there aren't any clock-watchers — one should not really look at that clock for the definitive response in everything.

This morning we have with us the Hon. Fred Bradley, Minister of the Environment. If you look at the annual report of the Heritage Savings Trust Fund, you'll note on pages 13 and 14 that there are four projects administered directly by the minister under his portfolio responsibilities; namely, Irrigation Headworks and Main Irrigation Systems Improvement, Land Reclamation, Lesser Slave Lake Outlet, and Paddle River Basin Development. The items are there with a brief description.

Mr. Minister, welcome again. If you have any overview comments, would you please proceed now, and then we will deal with representations from committee members.

MR. BRADLEY: Thank you, Mr. Chairman. It's certainly a pleasure to be back before the Heritage Savings Trust Fund select committee. I'd like to just give an overview of the programs under the department within the capital projects division. First I'd like to comment on the Lesser Slave Lake project. That has been completed. The weir on the Lesser Slave River is now in place and in operation. I think it's been a very successful project. It's come in much under the anticipated budget, which had been proposed at an early point in the development of this project, so in our judgment it's been a very successful project.

I'd like to give a brief overview of where we are with regard to the irrigation headworks and main irrigation systems improvement project. This is a very important project to Alberta. I think it's recognized that 4 percent of the arable agricultural land in the province is under irrigation, and it produces some 18 percent of the total agricultural product of the province. In terms of the situation we have today in southern Alberta, with the very dry conditions, I think the benefits of our irrigation investment in southern Alberta are very evident.

There were a number of components to this particular investment project in southern Alberta. Major activity has been rehabilitation and enlargement of irrigation canals and the headworks systems within two of the larger irrigation districts in southern Alberta. One of the major irrigation districts is the St. Mary River Irrigation District. To date, 61 miles of the St. Mary River Irrigation District main canal have been enlarged and rehabilitated, out of a total length of 176 miles. In the Lethbridge Northern Irrigation District, we've made improvements to the diversion works on the Oldman River and a flume over the Oldman River has been replaced. We are replacing structures at Willow Creek, Rocky Coulee, and the Keenex Coulee. These will be operational next year.

About 23 miles of the total 50 miles of the Lethbridge Northern Irrigation District main canal have been rehabilitated to date. We have enlarged

the carrying capacity of that canal from, I believe, some 650 cfs to about 1,500 cfs, that is, cubic feet per second. A lot of work has been done on both these canals to alleviate the problems of seepage. Seepage control improvements have been put into these canals. There had been problems along the canals, loss of agricultural production, because of the seepage and the salinity which had been created. With the seepage control in place, we will alleviate that particular problem and those lands will be rehabilitated and brought back into agricultural production.

We are working on offstream storage projects within both the St. Mary and Lethbridge Northern irrigation districts. Unfortunately the one at Keho Lake has been delayed. We've had some difficulty in acquisition of land. We anticipate that will be completed in time for us to continue construction next year on the Keho Lake offstream storage reservoir. This will increase the offstream storage capacity at Keho Lake from about 42,000 acre-feet to 75,000 acre-feet of storage.

With regard to the Forty Mile Coulee reservoir in the St. Mary River Irrigation District, we've had to delay the start-up of construction of that particular offstream storage reservoir. The Member for Cypress, a resident of Bow Island, has made strong representations to the government about the importance of the Forty Mile Coulee reservoir project. We've had discussions with the irrigation district involved and, as members of the committee are well aware, due to the funds that are flowing into the heritage fund we're only able to expend so many dollars on an annual basis. So we've had to delay the start-up of the Forty Mile Coulee project, in recognition that in discussions with the irrigation district they felt the main canal should have the first priority and that when funds became available we would proceed with the Forty Mile Coulee reservoir project.

There are two other offstream storage projects which are under construction or nearing completion. One is a 90,000 acre-foot storage project in the Eastern Irrigation District. It's known as the Crawling Valley reservoir. That is being undertaken under an agreement with the Eastern Irrigation District. At this time we also have under construction the Badger Lake offstream storage reservoir, which will add about 42,000 acre-feet of storage to the Bow River Irrigation District. That particular storage project is expected to be operational in 1986.

We have basically completed construction of a project in the special areas, which conveyed water from the Red Deer River, via something known as the Sheerness pipeline, to a holding pond which is being utilized by Alberta Power. Additional capacity was also built in for stock watering and irrigation downstream. Water from that particular project will also be utilized in the Hanna municipal water supply project, which is being undertaken by that community with support from the Department of Utilities and Telecommunications under their municipal water and sewer grant program. So that's a very multipurpose project.

Overall, it should be noted that this project has provided economic spin-offs to southern Alberta. It has stabilized the economic base in southern

Alberta. It's given us the opportunity to increase agricultural production. But not only do we have these benefits to irrigation; the irrigation districts and the supply systems supply water to some 48 municipalities in southern Alberta and to a number of industrial users. It provides water for over 3,000 stock waterers and domestic users. There are over 50 recreational sites on irrigation works, and there are six provincial parks associated with water distribution and storage projects in southern Alberta.

One of the important parts of the project has been rehabilitation to increase efficiency of use of water. I think that is being achieved and will be achieved through the completion of this very important irrigation headworks and main canal rehabilitation program. As members may recollect, this is a 15-year program. We're now into, I guess, the fifth year, the '84-85 fiscal year. So we have another 10 years in terms of this program and work to be done to see it through to its completion.

I'd next like to comment on the Paddle River project. As members will recollect, last fall when we were about 7 metres from the top, we had to stop construction, placing fill on the main embankment, due to monitored movements in the soil foundation. This has necessitated the addition of berms both downstream and upstream from the Paddle River dam. It has resulted in additional work having to be done. So work on the Paddle project is continuing, to put in place these additional berms. There are still some aspects that have to be completed. The gatehouse and control system have to be put in place. The spillway weir crest has to be put in place. We have to put the top-of-dam earthwork and riprap protection in place. There is some work to be done on the conduit and on recreational facilities, and we also have a bridge known as the Manola CNR crossing, which had to be modified and improved. So this work will continue, and it's anticipated that we will complete it in the '85-86 fiscal year.

It should be noted that additional costs related to the movements, which I have indicated as being additional earth berm construction. We have had to put in place additional monitoring and have had some analysis done with regard to the soil structures, et cetera. We had to make extensions to sections of the conduit. The total cost related to these measured movements of the soil foundation, to ensure the stability and safe operation of the structure, has added \$2.232 million to the cost of the project.

This work has been under the auspices of a review board, which has given advice to the government with regard to what additional work would be necessary. It has monitored the project and the various soil conditions and foundations from the beginning of the development of the dam and has basically given us direction as to how this work should proceed. We anticipate that we will have completed this project in the '85-86 fiscal year. We have gone over the purpose of and necessity for the project on previous occasions. I think it has been clear, in terms of the Hansard discussion, what the purpose of the project was, and the hon. Member for Barrhead has waxed eloquent about the benefits of the project and its necessity. Other members have presented some contrary opinions, and I have expressed my own opinion as to the necessity and importance of this project.

I'd like now to comment on the land reclamation

project. We have some \$3 million which we have dedicated toward this particular project of the capital projects division. It's broken down between a research component and looking at various reclamation possibilities, particularly with regard to coal mining on the prairies, in the foothills, and in the mountains. It's very important in terms of our ability to assess and be able to carry out reclamation work associated with coal mining projects.

Another major part of the program is to assist municipalities with the reclamation of garbage dumps, sewage lagoons, and other works within municipalities. We also assist the Alberta Forest Service and the public lands division with regard to reclamation projects under their jurisdiction within the forest reserve area. There is some support for Recreation and Parks with regard to reclamation projects in some provincial parks. Overall, this has been a very successful program. I believe we've expended some \$19 million to date, and I think any community that's benefitted by this program has certainly expressed a thank-you to the government for the type of work that's been undertaken, which probably wouldn't have been undertaken unless we had a program of this nature. It's not only resulted in reclamation of hazards; there's also been a beautification aspect to it, in terms of improving the aesthetics in a particular community. With that, I welcome questions from members.

MR. R. MOORE: Mr. Chairman, I want to compliment the department on their land reclamation program which reclaims old dumps and mines. It's an excellent program and is doing a good job out there in the province.

I'd like to know if we should be stressing greater emphasis on soil reclamation and the conversion of land into more productive farmland.

MR. BRADLEY: I think that's certainly a useful area to look at. It hasn't been part of our program to look at increased agricultural production or soil reclamation from that point of view. Perhaps the Department of Agriculture is more directly involved in that particular aspect than my department, but it certainly is a useful area. I believe the current land use hearings which the Environment Council of Alberta is holding will be looking at that particular aspect. They have very broad terms of reference. They're looking at maintaining and expanding the land base in Alberta, and I think the particular subject you've raised is germane to the hearings they've just held. I understand their report will be due later this fall or early winter.

MR. R. MOORE: Mr. Chairman, the white paper on future directions of the province stresses the importance of water management. In that question of water management, I'd like to know if you have any concerns as to the long-term consequences of water management. Should there be a commitment of heritage trust fund money toward a greater number of water storage facilities in Alberta?

MR. BRADLEY: That's a very important question. The white paper certainly stresses the management of our water resources. It indicates that it's the feeling of the position paper and the government that our water resource will be very important in the

future, and the management of water is a strategic part of that. Through the Heritage Savings Trust Fund and the projects we are currently undertaking in southern Alberta, I think it's a fairly important program. As I said, it is a 15-year program.

There are other projects which could be undertaken. I guess it's a matter of assessing their priority. We have announced the Oldman dam project on the Oldman River in southern Alberta. There are additional storage projects, such as the Milk River, which may be considered, and there are a number of other smaller projects which could be important to the overall water management strategy of the province. We have released the South Saskatchewan River basin planning program, which looks particularly at the South Saskatchewan River basin, because it's important for us in terms of assessing where we should be going in terms of management of that water, how we meet the requirements in that basin, and how we apportion water amongst the river basins.

Over the longer period of time, I believe there will be need for further storage projects, particularly from the point of view of effectively managing the water within the basins in which they originate. I think we have to look at that, efficiently use those waters, and manage them to the best of our ability. I believe that will require further storage projects if we're going to utilize our full share of the water.

MR. R. MOORE: Mr. Chairman, to the minister. Does the trust fund have a potential role in industrial pollution research; for example, into the sour gas wells and oil sands? Has it a potential role to play there?

MR. BRADLEY: We currently have research programs which are funded from the general revenue budget. The Alberta oil sands environmental research program is one which looks at related concerns in the oil sands development area. I think those are covered fairly well under our current programs in the General Revenue Fund. We also have the Alberta Environmental Centre at Vegreville, which has a number of programs that look at different research activities in those specific areas.

MRS. CRIPPS: Mr. Chairman, I guess we've spent the last 50 years studying the irrigation system and the needs of southern Alberta, and I certainly support your recent announcement on the Oldman dam. I think it's time we quit studying it and did something.

Have you done an evaluation of the construction in the irrigation system, or do we have that available; i.e., the effectiveness of the pipe, the open concrete, or just the earth-filled main conduit systems?

MR. BRADLEY: There have been research projects undertaken looking at what is the most effective material to use in terms of lining canals and at efficiency. Obviously a closed system is more efficient than an open canal, but one also has to look at the economics of such projects. That has been considered in terms of the work that is being carried out by both my department and the Department of Agriculture. But as we proceed with these programs, there is ongoing research looking at more effective construction materials and methods.

MRS. CRIPPS: Having regard for the international significance of the Milk River system and the apportionment of water in that system, have you given consideration to control of water on that system, especially in view of the downstream commitments we have in the United States? Is that something we should be looking at?

MR. BRADLEY: It's something that has been under active consideration for some time. In fact, there was a planning study on that particular river system. I'm not sure exactly what date it was completed, but it was within the last four years or so.

This summer I met with landowners at a meeting of the chamber of commerce in the Milk River region. There were certainly representations made by the water users and the people who depend upon the Milk River, whether it be the municipalities or farmers or ranchers, that we consider such a storage project in terms of water supply for either stock watering or irrigation. So the commitment I made to them was that I would review where we were with that particular project, consider it, and come to some conclusions on it. We haven't arrived at that point at this time, but we are certainly reviewing the earlier information we had and looking at whether we wish to commit to a storage project on the Milk River.

MRS. CRIPPS: Thank you. Can you give me a cost per acre of the Slave Lake outlet reclamation and the number of acres that have been made productive because of that project?

MR. BRADLEY: I don't have that information, but I can certainly have it forwarded to you.

MR. MARTIN: Mr. Chairman, just to come back to get a better handle on the irrigation projects in the future, tying into the white paper, I believe it says in here that the total investment as of March 31, 1984, was \$156.9 million. The minister indicates that's over, I believe, a 15-year period. At this particular time, could the minister update us on the total cost estimate over the 15 years?

MR. BRADLEY: We are currently looking at the total cost of the program. There have been some increases in terms of the scope, and we've looked at inflation factors. It's difficult to put a total cost on it, because some of the engineering work on some of the other provincial headworks and systems would have to be initiated to get a final figure.

In terms of the work we have today and the dollars that have been allocated in terms of the initial investment of \$234 million and looking at the inflation factor, I can say that we have available to us some \$333.4 million. There will be additional funds required because of the change of scope and looking at ensuring that work is done to a very high standard. I will be coming forward with revised figures when we have those available.

MR. MARTIN: Just to follow up in this general area, Mr. Minister. I believe you said in your opening remarks that 18 percent of total agricultural products in Alberta come from irrigated land. In terms of studies by his department, I'm wondering what the minister sees as the potential of future irrigated land. The question I'm asking: are we

looking at a lot of land that the department feels could be enhanced by irrigation, and what sort of scope? Is it just in southern Alberta, or what are we looking at generally?

MR. BRADLEY: Basically we're looking at the South Saskatchewan River basin. I could draw members' attention to the South Saskatchewan River basin planning report, which was released a couple of weeks ago. That document has a range of irrigation possibilities, looking basically at the supply of water. It has been estimated that there are some 8 million acres in Alberta that could potentially be looked at for irrigation. Looking at one of the maximum scenarios in terms of supply of water in the South Saskatchewan River basin, if we dedicated all the water in that basin to irrigation, or that particular use, we would arrive at being able to irrigate over 2 million acres. The supply of water is the limiting factor. In that particular basin, there is more land that can be irrigated than there is water available to irrigate. Basically the South Saskatchewan is the area where the irrigation investment would take place.

MR. MARTIN: Just to follow up. Of course, it gets into a very interesting area — obviously the heritage trust fund. There has been some debate, as the minister is well aware, about the Oldman leading to others and that the 2 million could become 8 million if there is a massive transfer. I saw the minister say on television that that wasn't the case, so I'll leave that alone. But let me look at ...

MR. BRADLEY: I hope the hon. member has got the message.

MR. MARTIN: I have to take the minister at his word now, but there are other projects that come up. That leads me to my question. One of the things the white paper says — and it is hazy, the minister must admit — is that "priority must be placed on additional river basin management and water storage programs". My question deals with this. The minister has indicated that there are some other possible projects, and I appreciate that if they come back from the white paper, they are going to go into other projects. In the next, say, three or four years, does the minister see that we will be coming back with more capital projects dealing with irrigation out of the heritage trust fund? Of course that would then change the estimates he was talking about.

MR. BRADLEY: It's difficult for me to say at this point in time. I think it's fair to say that to date we have a fairly comprehensive program in terms of rehabilitation of existing irrigation systems. That would be our first priority. We have announced the Oldman dam; actually a commitment was made in 1980 to proceed with that storage project. Beyond that, we haven't made any commitments for further storage.

I can't prejudge what the South Saskatchewan River basin planning program hearings, which are being held by the Alberta Water Resources Commission, will come forward with. To meet the different scenarios would obviously require additional storage. That would have to be a consideration the government would look at. In terms of any future

programs, I think we would be emphasizing the management of water within the basins in which they originate. I think any decisions by us for additional projects of that nature within the South Saskatchewan would have to await the recommendations of the Alberta Water Resources Commission as to how we are going to approach the management of water in that particular basin. So at this point in time, I don't see any further additions to the current program. I might say that we have not at this point in time finalized where the funding will come from with regard to the Oldman project. It may be useful for this committee to consider whether or not they would like to see that come from the capital projects division of the Heritage Savings Trust Fund.

MR. NELSON: I would like to deal with the minister on a couple of questions regarding the Paddle project. I'm having some bit of confusion here. I've just been looking at some numbers. Last year in your report to the committee it was indicated that ... Oh, I'm sorry; I'm in the wrong area here. It's all right; I've underlined a wrong item. I was just going to get you on something.

I was interested in the Paddle River project with regard to the difficulties that were encountered with slippage and other areas, where another \$2.3 million was required to assist in the development of the project. I was wondering what these additional costs were. Were they determined by poor engineering at the start of the project, or were they with regard to the slippage? How severe was it, and should we be looking at taking to task the engineers of the project rather than requesting additional dollars to shore up a possible deficiency in their work?

MR. BRADLEY: I think I explained last year — and it was recognized that there were some complex soil foundations in that area — that basically you design and monitor as you construct that type of earth-fill structure, because you recognize that there are going to be movements. There are some earth-fill dams that are in place today that are still moving, and they move at very small rates. So this is taken into consideration. You design the thing, you monitor, and then if you have to make modifications as you proceed, you do that. That was part of the project concept at the Paddle River.

As I said, an international review board of some very prestigious individuals who have been involved with earth-fill dam construction have been reviewing progress and have basically given direction and recommendations as to how to proceed at various stages of the project. Of course the monitoring equipment has been in place because part of the project is to monitor movement. So last fall when the movements reached a certain point, it was decided that we should not place any more fill on the embankment but should let the pore pressures which had built up in the soil structures decrease, I guess — there's a word for that; it evades me at this time — and then continue to place further fill. Because of the movement that had been experienced in the conduit — I think I explained that the conduit has collars on it; there's provision for movement — it was decided at that time that we would be placing additional earth fill both upstream and downstream.

The review board has looked at this and, because

of reviewing the whole thing, has said that we should put additional fill here and additional fill there to in fact stabilize the structure and, I guess, to prevent any further movement at the same rate that was experienced earlier. This is why you add more fill — to stabilize the structure. Also, in terms of the conduit, there were certain sections at which the conduit was extended within the structure to reduce the spacing in the conduit. With the addition to the conduit, with the collars in place, it would be satisfactory in the future if further movements take place, which are anticipated, as I said.

So no, I don't think it's something we go back to the engineers on. It's part of the project; it's part of that type of construction that you design and monitor and make modifications as you go along with the experience you have placing the fill. It's a very complex soil foundation there.

MR. NELSON: Mr. Chairman, to the minister. Was this review board that was set up with regard to this dam, set up before or after the project was started and before or after the slippage?

MR. BRADLEY: The review board has been part of the project from the beginning and has been part of the this design/monitor. They've been meeting since the project started, with regard to giving direction. So it's been something that has been going on since the start of construction of the project. They've been part of the project from the beginning. As part of the terms of reference of the project, a review board would give this type of advice as we proceed. As I said, earth-fill construction requires this type of monitoring.

MR. NELSON: One further question with regard to the Paddle, and then I'll get in again for something else. Do we now have a final, finished price for this project, or do we still have to monitor and re-evaluate the project as it's nearing the completion stages?

MR. BRADLEY: We don't anticipate that there will be any further costs than what we now estimate. I think we estimated the total cost of the project in the '84-85 budget to be about \$38 million. Due to the movements which I've indicated and the work that's required to correct that, there's been an additional \$2,232,000. There have been claims come in from contractors, which have to be settled, and we've estimated that claim settlements may add \$1 million to the project. There are still settlements with two landowners, to be determined by the Land Compensation Board, for acquisition of land, and we are estimating at this time that that would be \$500,000. In addition to that, the project has purchased certain assets which have to be disposed of, so there would be funds coming back to the project. We're anticipating the final figure will be some \$42,233,000.

MR. MARTIN: Just to follow up, because I have a fourth question dealing with the irrigation system. Mr. Minister, it's been said — I don't know if it's correct or not — that there might be immense value in upgrading the present irrigation system, that in some cases it has become very inefficient; there's a fair amount of leakage and these sorts of things. My

question is twofold. In his department's assessment, is this in fact the case? Following from that, if that is the case, has the department thought about spending money from the heritage trust fund, as a capital project, to upgrade the present system in terms that this might maximize, if you like, the bang for the buck in helping out southern Alberta?

MR. BRADLEY: I can refer the hon. member to the news release of 1980, which announced this program. The emphasis of the program has been exactly that, in terms of rehabilitation of existing canals and improvements to them. It was felt that while we were doing this important rehabilitation work, if there was expansion that could be included in the contract, it would be prudent to do so and to plan for the future. So the first priority has been rehabilitation. Looking at improvements that would allow for expansion has been part of the project.

Within the funds allocated by Agriculture, a major emphasis has certainly been improvement of the distribution systems within the irrigation districts. Our emphasis has been on delivery of water to the irrigation districts, but the overall emphasis has been rehabilitation and improving the efficiency of use of water within the existing systems. One of the key features of this investment has been to upgrade, rehabilitate, and put into good working order those canal systems which were developed some 60 and 70 years ago.

MR. MARTIN: Following along with what the minister said, Mr. Chairman, that there has been some upgrading, is the minister saying that the overall system at this point is as efficient as it could be, or is there a lot more work to go into the present system? I don't know if it's true that there's a fair amount of leakage and wasted water in the present system. Is that true or is it not?

MR. BRADLEY: I can only refer the member back to the announcement of this program, which has a component in my department and a component in Agriculture. The program recognized the current state of the irrigation districts' distribution systems and main canals. The major point of it was to in fact make these improvements to them. It was envisioned as a long-term, 15-year project. Initially, Agriculture was allocated funds for five years. I believe the minister has been before the committee, and that question has been thoroughly reviewed; he is reviewing the current status of his program. In 1980 my department made certain commitments that over a 15-year period we'd see this major rehabilitation work done throughout the irrigation districts. That's the commitment we made, and we intend to follow through on it.

MR. MARTIN: Okay, just to follow up. I'm trying at this time, recognizing that it is a 15-year project — I take it that the minister feels that in 15 years the total system would be revitalized, in good shape. But at the present, after four years, is the minister saying that to get this up to snuff, if you like, so it's not a lot of waste, it will probably take another 11 years to bring it to what he would consider to be satisfactory?

MR. BRADLEY: You're looking at 13 irrigation

districts, and obviously the conditions vary in different systems. What we have done is identified, on a priority basis, those systems which we are allocating funds to today. Through the balance of the program, we will be allocating funds to take care of the components in other systems. What we are attempting to do with the rehabilitation to date is go into the priority areas first. That is what the emphasis of the program has been. As I've indicated, there has been progress made on the St. Mary and Lethbridge Northern main canals. Those were the two priorities that were identified as requiring immediate attention.

MRS. CRIPPS: Mr. Chairman, just to follow up on Mr. Martin's questions. Have the irrigation districts experienced the same reduction in construction costs that we've experienced in the road programs? If so, has this enabled them to move up some target dates?

MR. BRADLEY: There have been some reductions experienced. I think the Crawling Valley and Badger projects came in under our estimates, and there have been some savings in terms of the contracts let on the LNID and the St. Mary. So yes, it's fair to say that they are coming in under what had been some of the estimates.

MRS. CRIPPS: Are those funds that have already been estimated being used to, say, expand any particular project?

MR. BRADLEY: Over the next three years, we've been allocated some \$60 million a year. Within that \$60 million, we've been accelerating a project if we have additional funds available to us.

MRS. CRIPPS: Because of the drought situation, has the minister been approached to speed up internal storage and canal upgrading?

MR. BRADLEY: Strong representations have been made to me by the Member for Cypress and representatives of his community to advance the Forty Mile project. I think we're prepared to proceed with that project as soon as we feel the funds are there to carry the project over the two- or three-year construction period that it would take. Our priority at this point is the main canals themselves, but we are reviewing the question of the starting date for the Forty Mile project. Of course, budget is a consideration.

MR. HYLAND: With the questions from the members for Edmonton Norwood and Drayton Valley, Mr. Chairman, I should say at this time that if you want to see how both projects can work together, Environment and Agriculture, I would invite the committee to do a tour of the Bow Island area, where both projects worked together and they've got a state-of-the-art pumping system where some 6,000 acres are pumped from a central site. All the farmer has to do is turn a valve in the field and he's got water there. We might consider a tour at a later time to see how our money has been invested.

Secondly, Mr. Chairman, I'd like to ask the minister a question related to the Bassano dam. I'm not exactly sure where trust fund money is involved in that. I think it starts at the canal immediately

adjacent to the dam. At what stage is the repair on the dam? Because of the silting problem, when are we going to start repairing it, and when are we going to repair the main canal? I think there's a negotiation problem there. When are we going to start repairing that, and is some of that out of the trust fund?

MR. BRADLEY: With regard to the Bassano dam, that was an agreement we had with the federal government when we took over a number of the PFRA works back in, I believe, 1973. As part of transferring these works to us, the federal government made a commitment that they would upgrade and rehabilitate the Bassano dam. So I understand that's a project the federal government, through PFRA, has announced and will be proceeding with.

With regard to the canal from the Bassano dam which feeds the Eastern Irrigation District, that's one of the other projects which we have under consideration and which we'll be looking at allocating funds to in the future through the Heritage Savings Trust Fund. At this time we haven't signed any firm agreements with or made any commitments to the Eastern Irrigation District, but we're looking at the project. It will be one of the projects we'll consider in the balance of the program through to 1995.

MR. HYLAND: Does the minister have any idea when we would be — you just related to 1973 when we signed the agreement. We still haven't started rebuilding it to any great extent — some minor repairs. Does the minister have any idea when the rebuilding of that canal would start?

MR. BRADLEY: I don't have that information, but I can get it and advise the member accordingly. As I say, it is under the jurisdiction of the federal government. They've announced that they're going to proceed with it. I believe the work will be starting in the very near future, but I can get that information for the member.

MR. HYLAND: My third question is relating to — during your opening remarks you made comments about the different methods used in lining and rebuilding canals. Do we have a system where we're keeping track of our research, where it will be useful for other times? Let's take the design of the main canal: are the engineering companies involved freely exchanging information so each engineering company doesn't have to make the same mistakes? Are they letting the others know the problems they are involved in, and are we tabulating that somewhere? We're probably further ahead in canal rebuilding than many places in the world just because of the massiveness of what we've taken on?

MR. BRADLEY: That's a very important aspect of the work we're doing. I know there have been meetings between engineering firms involved, both engineers contracted by the government and by the irrigation districts themselves, particularly with the St. Mary project and Lethbridge Northern, to ensure that they're proceeding with the same standards, et cetera. I'd have to check on the sharing of the particular information the member has alluded to. I think it's very important that this information be put

in a central depository and be available for the future. I think that type of information is available to them through the Irrigation Projects Association and the Irrigation Council.

MR. NELSON: Mr. Chairman, I'd like to get back to the Paddle River for a minute. Would the minister suggest that at the end of March 30, 1984, the Paddle River project would have been about 80 to 85 percent complete?

MR. BRADLEY: We anticipated last fall that it was about 90 percent complete in terms of where we were at that point in time. There has been the additional work which I have outlined to the committee today.

MR. NELSON: That being the case, when do you anticipate this project will be completed?

MR. BRADLEY: We anticipate that it will be completed in the next fiscal year. I think one has to note that the type of work being done and the placement of material at this stage is very specific, and there's some other minor work that has to be completed. So we anticipate that it won't be finished until next year.

MR. NELSON: It might be a good tour to have a look at the Paddle River, Mr. Chairman. We'd love to come up to your constituency. I might like to make a formal request that maybe we should do that presently.

One further question. Considering the various projects on reclamation, I was just wondering if the minister has ever considered, or thought about requesting, heritage savings trust funds to assist the city of Calgary and a lot of communities downstream from the city to do some reclamation work on the Bow River. Considering the filth that is evident in certain parts of that river and what the future holds for the people downstream especially — and of course the taxpayers of the city of Calgary may have to foot some of that bill.

MR. BRADLEY: That's a very interesting proposition. I'm not sure I agree with everything the hon. member has stated with regard to the Bow River, but there certainly are some problems. When the member talks about the condition of the Bow River, I believe he is really talking about the sewage effluent which comes from the municipal treatment systems of the city of Calgary, because that's the major problem. The South Saskatchewan River basin planning program looks at sewage treatment and addresses different scenarios to look at the treatment of sewage going into those systems, and there are various options. I am sure representations will be made to the Water Resources Commission with regard to the nature and type of sewage treatment.

The province has provided the city of Calgary with 50/50 cost sharing on phosphorus removal. That has been initiated and is being reviewed. The amount of phosphorus going into the Bow River has decreased dramatically as part of that program. The major problem with the Bow is basically the loading of nutrients, both nitrogen and phosphorus, into the river system, which promotes growth of weeds and

algae. When it decomposes, that weed and algae creates some of the odour problems, et cetera, in the river system. It was felt that if you remove phosphorus, which is the critical nutrient in terms of weed and algae growth, that would significantly reduce the weed and algae problems in the Bow River system. I think we have to assess the effectiveness of that phosphorus removal program.

The other thing you have to look at is that even with phosphorus removal, in years of low flow, with lower water volumes in the river system, you're still going to have this weed problem, because you still have a certain concentration of nutrients loading the river system. In years when we have more water in the river system, there's a greater dilution factor and consequently you don't have the same ability for weed and algae to grow. So we have looked at that problem, we have provided the phosphorus removal grant, and we believe that will go partway to reducing the weed and algae problem in the Bow River.

The basic problem with the Bow is the growth of weed and algae, and it's greatly an aesthetic problem. On the other side of the coin, it's well known that the Bow River has been touted as one of the prime trout fisheries in this province and perhaps in North America. One has to appreciate that the nutrient loadings to the Bow River system have contributed to the fish habitat and to that very productive fishery. So there are two sides to that. Certainly it would be desirable to see less loadings going into the Bow River system. Something that has to be assessed with the city of Calgary and addressed by the municipal authorities is: what further treatment do they wish to proceed with, and is it necessary? As I said, before we suggest any further approaches, I think we have to review the status of our current program to see if it's meeting our objectives. There have been some suggestions that we look at an irrigation scheme which would use the sewage effluent from the city of Calgary. That is also one of the scenarios which is presented in the South Saskatchewan River basin planning program, and I believe the Water Resources Commission would invite representation from citizens with regard to that particular aspect of the South Saskatchewan River basin planning program so they can get input from citizens and come back to us with regard to their recommendations.

MR. COOK: Mr. Chairman, I wonder if the minister could outline the soil salinity problems that are being experienced in the irrigation areas and what remedial actions might be taken by the heritage fund to correct those problems. I understand they're problems not only in this area but worldwide with any irrigation system.

MR. BRADLEY: I think that question, within the irrigation districts themselves, can best be answered by the Minister of Agriculture. I don't know if that question was put to him. There are certainly salinity problems. There are salinity problems in dryland areas also. Our approach through the area where we're responsible, which is the main canals, has been rehabilitation to prevent seepage, which is the major cause of salinity, and associated rehabilitation in the lands adjacent to those canals. We have been putting in the design a polyethylene or polyvinyl liner — I'm

not sure what you call it, but it's a plastic-type liner which prevents seepage — and we use cutoff curtains. We have various methods to prevent the seepage, which will prevent the problem from occurring from the works we are responsible for.

MR. COOK: Mr. Chairman, there's a soil salinity problem in the areas around irrigated lands; not just water seepage from canal works but irrigation as a whole. Would the minister recommend that this committee consider funding some sort of research project to try to develop remedial action to prevent that kind of problem from occurring in the environment.

MR. BRADLEY: The basic area you're discussing really falls under the purview of a different portfolio, that of the Minister of Agriculture. Within the irrigation districts themselves, I know that his department and programs look at the question of soil salinity. With regard to the distribution works there, his rehabilitation program looks at that. There is work being done in that particular area, but the Minister of Agriculture would be in a better position to give you the assessment you are requesting.

MR. COOK: Mr. Chairman, a second question relates to a conversation I had a while ago with the mayor of Fort Saskatchewan. She recently took a canoe trip down to Fort Saskatchewan and was appalled by the water quality and the crud that was floating in the river. I wonder if the minister could outline ways this committee might consider making recommendations to improve the water quality in the North Saskatchewan, which probably has close to a third to 40 percent of the province's population dependent on it.

MR. BRADLEY: I too took a trip along the North Saskatchewan River this summer, from the E.L. Smith Water Treatment Plant to a bridge some distance downstream from Fort Saskatchewan. Perhaps it was the day, but I didn't notice the same type of difference in the river system upstream as downstream. There certainly were certain problems. I think the major problems are with some of the current municipal sewage outfalls. We are addressing that through the Edmonton regional sewage treatment plant and the regional sewage interconnections which we anticipate will take place in the future. In our judgment, that will resolve the major problems with regard to the quality of water or the major concerns with regard to outfalls into the North Saskatchewan system.

The other industrial and municipal outfalls — the city of Edmonton Gold Bar plant, for example — are operating adequately at this time.

MR. COOK: My third question, Mr. Chairman, relates to water in the irrigation systems as well. Would the minister recommend that we consider some sort of metering system? The question I ask is: would users of the water be more efficient if they had to pay not a per-acre charge but a volume-used charge so that they would exercise some financial discipline when they were using the scarce natural resource the province is spending so much money to provide to them?

MR. BRADLEY: In terms of the irrigation districts themselves, we are going to encourage the metering of water at all major turnouts in the irrigation systems. That is something we wish to proceed with. In terms of a charge, that's something which has been suggested. I think one has to recognize that in the irrigation districts today there is a range which they charge their users for upkeep and maintenance and their share of work to operate the district, and the maintenance and rehabilitation work that's taking place. That particular charge today ranges from \$7 to \$12 per acre. It has been suggested that a flat-rate fee of 50 cents per acre-foot be charged in terms of usage of water. When you consider that they are now paying \$7 to \$12, and one and a half acre-foot is usually the consumptive use of water, you would be adding 75 cents. I don't think that is a significant charge which would change the practices of current irrigation operators.

The charge which the irrigation district charges them per acre is five to 10 to 15 to 20 times higher than what has been suggested as a fee for the use of the water. So I think the charge the irrigation districts themselves charge the members of the irrigation district today is sufficient incentive for them to adequately and properly utilize their water.

MR. COOK: Mr. Chairman, could I ask one last question?

MR. CHAIRMAN: Actually it's your fifth. Mr. Alger.

MR. ALGER: Go ahead.

MR. COOK: Would the chairman relent?

MR. CHAIRMAN: It appears that the committee members have agreed to accept your fifth question.

MR. COOK: Mr. Chairman, a supplementary question on this. Would the minister recommend then that the charge not be on a flat acreage basis but that all of the charges be converted to a water volume charge rather than a flat-use charge, so that the financial discipline in the system would encourage conservation of a scarce natural resource that, as you've pointed out, we're going to be committed to spending about \$350 million delivering?

MR. BRADLEY: The province hasn't charged a fee for domestic use, municipal use, agricultural use of water. We haven't had a policy where we charge people for the resource. It's not our intention at this point in time to proceed in that direction, to charge people for the water. We believe it's something the people of Alberta have enjoyed the benefit of and will continue to enjoy the benefit of. We aren't going to place a charge for the use of that resource.

We have to recognize, and I think I tried to explain, that the type of projects we're involved in are multiple use. They don't benefit only a particular sector, although there are certainly significant agricultural benefits from our projects. They are multi-use in the sense that a number of municipalities — I think I referred to some 48 — get water supply from these types of systems. There are recreational benefits in terms of the number of recreational sites. The water is used by ranchers to

water their cattle. There are provincial parks which depend on the water supply for creating that type of recreation. So there are all sorts of other uses of this water, plus the habitat, in terms of our fisheries and wildlife, which is created by these projects.

We manage the water for multiple use. These systems, in terms of our funding of them, recognize that the benefits go far beyond a single user. So there are benefits to the whole province. We have not charged for water; we do not intend to charge for water at this point in time.

I mentioned — and perhaps the member wasn't listening — that the suggestion of a volume charge for water would be significantly less than the irrigation farmers today are paying to the districts for the maintenance and operation of the systems themselves. One should take into consideration the expenses that the irrigation farmer himself is completely responsible for on his own land, which is a very significant investment beyond the fee the irrigation districts assess.

MR. ALGER: Mr. Chairman, I wonder if the minister hears from a lot of people, as I do, that there is a need, if you like, for far more water storage than we are going through at the present time. Do you get a lot of requests for smaller dams on smaller creeks and rivers and such, that you think could be established at some point in time, in a rather reasonable manner, I would think, through heritage funding?

I would like to speak on an area I am most familiar with, and that is in the Highwood constituency. For instance, the Highwood River is a gorgeous little river that comes gushing out of the mountains just as fast as can be, and it has huge, long canyons in it that could be dammed. A dam could be built without the disturbance of anything except possibly natural habitat that may nest along its banks. Other than that, I think water storage in areas like that, the Sheep, the Pekisko — all those places have great storage spots for these dry years. If we had them now, we'd certainly be most grateful. However, in periods of low flow you notice it most and of course start thinking about these things.

Does the minister have any ideas in mind for the future for damming such areas as that?

MR. BRADLEY: I think every municipal district, county, or improvement district in the province has some water storage project they'd like to see proceed at some point in time. There are a number of these smaller storage projects which have been suggested from time to time. We look at these types of projects through the general revenue budget of the department. Because of wide regional benefit, some of them are funded 100 percent by the department. There are other smaller projects that we cost-share with municipalities on a 75/25 basis, because the benefit is more local. So we do have programs in place.

I think a dry year like the one we've experienced this year makes us recognize more the importance of and the need for these types of water storage projects, and I appreciate the representations the hon. member is making, that we should consider more of these smaller storage projects. As I said, a number of them have been and are funded every year from the department's general revenue budget. We

depend on requests from municipalities to assess how these projects fit into their priorities. But we appreciate those representations.

MR. ALGER: Thank you, Mr. Minister. Chairman, if I may, I'd like to indicate that the Bow or the North Saskatchewan are not the only rivers that have difficulty with algae on the downstream side of bigger towns and cities. Indeed these same rivers that I refer to, the Sheep and the Highwood in particular, have that problem. While other departments are busily engaged in building better sewage systems — I think it's the influx of people that happened so fast from the late '70s to the present time that has created this; not enough equipment, as it were, to handle this sewage. Consequently our algae problem is in a very distressed sense down there, and I had hoped that if water were stored in the canyons I've suggested, it could be released from time to time for a flush job, you might almost call it, and compensate for some of those problems throughout the next few years.

MR. BRADLEY: If I could comment, I think the committee should be reminded that from about 1979 to the present the province has allocated some \$500 million, I think, to water and sewage treatment upgrading projects in the province. It's a very significant contribution. I don't think the magnitude of that type of program, to improve these types of works, is matched by any other jurisdiction in Canada. So there has been money allocated for that. In years of low flow like we're experiencing this year, particularly because of a very low flow in the Highwood area, I think the nutrient problem, the weed and algae growth, is very apparent. If there were higher flows, it would not be a problem. I think we have to recognize that.

We recognize that our streams have a certain assimilative capacity to cleanse these nutrient loadings, and maintaining a minimum flow on a number of these rivers would enhance that particular assimilative capacity. So additional storage on these streams and rivers in the province has that benefit. One can only look at the benefit the North Saskatchewan River has had from upstream storage projects. In the 1950s the North Saskatchewan River was devoid of oxygen, which meant it was basically a dying or dead river. With the storage and the improved treatment on the North Saskatchewan system today, we don't have those oxygen deficiency problems. The North Saskatchewan is a very live river today, a marked improvement over where it was in the mid-50s.

MR. CHAIRMAN: Are there additional questions from committee members? Mr. Cook.

MR. COOK: Going back to the question of water volume charges, would the minister consider charging not for the water but for the delivery system for the water? I think the figure you gave was \$156 million spent to date. Would we consider charging for water delivery services on a volume basis so that financial discipline was exercised?

MR. BRADLEY: Perhaps the hon. member has a different point of view than I have. I tried to explain to the committee that because of the overall

provincial benefit of this type of project, we feel it should be funded 100 percent by the province. Within the irrigation districts themselves — you may have discussed this with the Minister of Agriculture — there's a formula under which the person who benefits, which in this case is the irrigation farmer, pays a certain share of the rehabilitation works within those systems. But the formula recognizes that there is greater benefit to the national domestic product, the provincial domestic product, and the regional domestic product, and that the major part of these costs should be borne by those who benefit the most. This is recognized. Because of the multiple purposes the headworks structures and main canals are put to, to benefit the whole region in different ways, we feel these are the responsibility of the province to fund.

MR. CHAIRMAN: Are additional questions forthcoming from committee members? If not, we'll adjourn this morning.

Thank you very much, Mr. Bradley. If all goes well, we'll look forward to seeing you one year hence. This afternoon we'll be meeting with the Hon. Hugh Planche, Minister of Economic Development. We bid you adieu. Thank you.

[The committee adjourned at 11:16 a.m.]