ORAL HISTORY INTERVIEWS

JIM RAWLINGS

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STATUS OF INTERVIEWS:
OPEN FOR RESEARCH

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Interviews Conducted and Edited by:
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Interviews conducted–1995
Interview edited and published–2022

Oral History Program
Bureau of Reclamation
Denver, Colorado

SUGGESTED CITATION:

Rawlings, Jim. *Oral History Interview*. Transcript of tape-recorded Bureau of Reclamation Oral History Interviews conducted by Brit Allan Storey, Senior Historian, Bureau of Reclamation, Billings, Montana in 1995. Edited by Brit Allan Storey and desktop published by Andrew H. Gahan, Historian, Bureau of Reclamation. Repository for the record copy of the interview transcript is the National Archives and Records Administration in College Park, Maryland.

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Statement of Donation

STATEMENT OF DONATION OF ORAL HISTORY INTERVIEWS OF JAMES A. RAWLINGS

1. In accordance with the provisions of Chapter 21 of Title 44, United States Code, and subject to the terms, conditions, and restrictions set forth in this instrument, I, James A. Rawlings, (hereinafter referred to as "the Donor"), of Billings, Montana, do hereby give, donate, and convey to the National Archives and Records Administration (hereinafter referred to as "the National Archives), acting for and on behalf of the United States of America, all of my rights and title to, and interest in the information and responses (hereinafter referred to as "the Donated Materials") provided during the interviews conducted on November 16, 1994, and March 6, 1995 , at my home in Billings, Montana, and prepared for deposit with the National Archives and Records Administration in the following format: cassette tapes and transcripts. This donation includes, but is not limited to, all copyright interests I now possess in the Donated Materials.

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James A. Rawlings

INTERVIEWER:_____
Brit Allan Storey

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Editorial Convention

A note on editorial conventions. In the text of these interviews, information in parentheses, ( ), is actually on the tape. Information in brackets, [ ], has been added to the tape either by the editor to clarify meaning or at the request of the interviewee in order to correct, enlarge, or clarify the interview as it was originally spoken. Words have sometimes been struck out by editor or interviewee in order to clarify meaning or eliminate repetition. In the case of strikeouts, that material has been printed at 50% density to aid in reading the interviews but assuring that the struckout material is readable.

The transcriber and editor also have removed some extraneous words such as false starts and repetitions without indicating their removal. The meaning of the interview has not been changed by this editing.

While we attempt to conform to most standard academic rules of usage (see *The Chicago Manual of Style*), we do not conform to those standards in this interview for individual's titles which then would only be capitalized in the text when they are specifically used as a title connected to a name, e.g., "Secretary of the Interior Gale Norton" as opposed to "Gale Norton, the secretary of the interior;" or "Commissioner John Keys" as opposed to "the commissioner, who was John Keys at the time." The convention in the Federal government is to capitalize titles always. Likewise formal titles of acts and offices are capitalized but abbreviated usages are not, e.g., Division of Planning as opposed to "planning;" the Reclamation Projects Authorization and Adjustment Act of 1992, as opposed to "the 1992 act."

The convention with acronyms is that if they are pronounced as a word then they are treated as if they are a word. If they are spelled out by the speaker then they have a hyphen between each letter. An example is the Agency for International Development's acronym: said as a word, it appears as AID but spelled out it appears as A-I-D; another example is the acronym for State Historic Preservation Officer: SHPO when said as a word, but S-H-P-O when spelled out.

Introduction

In 1988, Bureau of Reclamation created a History Program. While headquartered in Denver, the History Program was developed as a bureau-wide program.

One component of Reclamation's History Program is its oral history activity. The primary objectives of Reclamation's oral history activities are: preservation of historical data not normally available through Reclamation records (supplementing already available data on the whole range of Reclamation's history); making the preserved data available to researchers inside and outside Reclamation.

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For additional information about Reclamation's History Program see:
www.usbr.gov/history

Oral History Interview
Jim Rawlings

Storey: This is Brit Allan Storey, Senior Historian at the Bureau of Reclamation, interviewing Jim Rawlings in his home on North Gregory Street in Billings, Montana, on November 16, 1994, at about one o'clock in the afternoon. This is tape one.

Mr. Rawlings, could you tell me where you were born and raised and educated and how you came to the Bureau of Reclamation, please?

Early Life

Rawlings: I was born in Cottonwood, Idaho, on February 4, 1935. My family actually lived in Greensville, Idaho, which is down the road about maybe twenty miles, but there wasn't a hospital in Greensville at that time, so my mother and father went to Cottonwood, and that's where I was born.

We lived in Idaho at various locations for eight years, starting out in Greensville and Idaho Falls and Moscow. My father, at that time, he was county agent with the Department of Agriculture. So, his job assignments were similar to Reclamation. He was transferred on several occasions. So, we kind of bounced around Idaho for a while. The last location in Idaho that we ended up was Idaho Falls, and at the age of eight, my mother died. I had three other brothers and sisters, two sisters and one brother. I was the youngest of four. So, with the death of my mother, us four kids–I was eight and my brother was nine and half and my sister a year and a half older than that and then the other sister is a year and a half older than that--we went back to Indiana to live with my grandparents, my mother's parents, while my dad stayed with his job with the Department of Agriculture. This was during the war years, so his job was critical to that effort. Then he went with the Relocation [War Relocation Authority], a federal organization that operated and maintained the internment camps for the Japanese people. In fact, he was a camp manager in Minidoka camp when it closed. That's a side history, but kind of interesting.

I went to school and started school in Idaho Falls, first grade and probably the second, then moved to Hartford City, Indiana, to live with my grandparents. I furthered my education there until the eighth grade. My brother and I moved back to Montana. At that time, the war was over, and my father had come with the Bureau of Reclamation in 1946 as assistant regional director in Billings, Montana, in what was then called the Region Six, later named Upper Missouri Region and later named the Missouri Basin Region and the Great Plains Region. That's a long

story.

So, in 1948, my brother and I came by train back to Billings, Montana, to live with my father. We lived in a boardinghouse, the three of us, and my brother and I went to school–of course, Dad worked--and finished junior high and high school in Billings, Montana. Graduated from high school in 1953, Billings Senior High School.

Went to Eastern Montana College in Billings the first quarter, the fall of 1953, not knowing exactly what I wanted to do with my life, being a little short of money. After one quarter at Eastern Montana State College–it's now called Montana State College-Billings, just recently named–I decided that maybe I better get my military career out of the way and hopefully be eligible for the G-I Bill for college, which I did. I joined the Marine Corps on January 4, 1954, with three or four other friends of mine from Billings. We all went into the same outfit in San Diego and went to boot camp.

After two years in the Marine Corps, I came back to Montana and immediately entered Montana State College at Bozeman, pursuing a degree in engineering–this was the winter quarter of 1957–and finished my degree in agricultural engineering. It was what they call a civil option, graduating in June of 1960. That's the very month that I signed on full time with Reclamation as a civil engineer in Great Falls, Montana. That was the Upper Missouri Projects Office, I think it was called.

Joining Reclamation

Prior to that, though, I did start work with Reclamation as a summer employee in 1951 as a rodman on a surveying crew. In those days, you could hire on with the government when you were sixteen. I was sixteen that summer. My brother and I, in fact, both were on the same surveying crew. Our survey chief, party chief, was named Jess Bunker, and our assistant chief was McDaniels. We called him Mac. I can't remember his first name. He went by the name of Mac. We had a total party of ten people, and our assignment that summer was to camp out in tents along the Missouri River near what is now known as the Robinson Bridge, but at that time there was not a bridge. There were several ferries along the river, you know, and we went from Billings by car to the river's edge and then we either went by boat across to our camp in tents or we drove to a ferry crossing and took our car that way.

We worked on what was called the Rocky Point Dam site survey. Our job was to take topography at the proposed reservoir site and the reservoir area itself.

We worked ten days on and four off and we "batched" and bought our food to put in and batched and lived in tents. Our per diem was six dollars a day. I think my annual salary as a G-S-1 was right at $2,000 a year, a little less maybe, and I thought that I had never seen so much money, especially with the per diem, because, as I recall, we had a little left over at the end of the week. We got six dollars a day. In those days it was quite a bit of money.

That was a good experience for me and my brother. Then we went back to high school, and then the next summer I went back with Reclamation again in the summer of 1952 and did the same type of work, only this time I was stationed in the vicinity of Glasgow, Montana, which was kind of the headquarters for rehabilitating the Milk River Irrigation Project,[1] which was constructed by the Reclamation in the early teens. There was a devastating flood in 1952, and we were assigned to rebuild the canals and structures that were washed out by that flood. So that's why I spent the summer in the Glasgow, Montana, area, again as a rodman on a survey crew.

Then back to when I started full time in June of 1960 in Great Falls, Montana, I was in the projects' office, what we called them in those days, and my job was to work on the operation and maintenance of existing irrigation projects. Got into groundwater drainage work, install and read observation wells to monitor the groundwater in the project areas to determine if and when drainage would be needed, a subsurface drainage. I assisted with crop census work and land classification work.

Project Manager

Then in 1962, I was asked to transfer to Helena, Montana–this was two years out of college now–and my new assignment was to be the manager of two irrigation projects that we built, one called the Helena Valley Unit,[2] and one called

[1] The Milk River Project in north-central Montana furnishes water for the irrigation of about 121,000 acres of land. Project features are Lake Sherburne; Nelson and Fresno Storage Dams; Dodson, Vandalia, St. Mary, Paradise, and Swift Current Diversion Dams; Dodson Pumping Plant; 200 miles of canals; 219 miles of laterals; and 295 miles of drains. A water supply is furnished to project lands which are divided into the Chinook, Malta, and Glasgow Divisions and the Dodson Pumping Unit. The lands extend about 165 miles along the river from near Havre to a point 6 miles below Nashua, Montana. For more information see, Wm. Joe Simonds, "Milk River Project," (Denver: Bureau of Reclamation History Program, 1998), https://www.usbr.gov/projects/pdf.php?id=136.

[2] Helena Valley Unit of the Pick-Sloan Missouri Basin Program is in central Montana, adjoining the city of Helena, and 3.5 miles west of Canyon Ferry Dam on the Missouri River. The principal purposes of the unit are irrigation and municipal water for the city of Helena. Features of the development are a tunnel, dam and regulating reservoir, canal, pumping plant, and other facilities to furnish water to about 17,000 acres of land and for municipal use. For mor information see, Jedediah S. Rogers, "Helena Valley Unit: Pick-Sloan Missouri Basin Program," (Denver: Bureau of Reclamation History Program, 2009), https://www.usbr.gov/history/ProjectHistories/PSMBP%20Helena%20Valley%20Unit%20D2.pdf.

the Crow Creek Pump Unit.[3] The Helena Valley Unit is in the Helena Valley near Helena, Montana, and the Crow Creek Pump Unit is near a little town called Toston, Montana, which is about thirty or forty miles south of Helena toward Bozeman. Being fairly young, I thought, to have that kind of responsibility, I think, was a real privilege for me and good opportunity to learn how to not only run the water and the system and maintain the project, but to successfully deal with landowners and help them solve their problems and actually make the project work. Both of them were fairly new projects.

This was during what we called in those days the development period. The farmers on these projects actually signed a contract with the federal government to pay back the cost of the project. Now, that payback was based on their ability to pay. That portion of the cost that they couldn't pay for, the power revenue from the Pick-Sloan Missouri Basin System, paid the difference.

So, my job was to operate the project during part of the ten-year development period, at which time then the government forces were moved out of the operation and the irrigation districts hired their own manager and their own people to take over where Reclamation had left off. This development period was designed to give the farmers roughly ten years to get their farms in shape and learn how to irrigate and be able to make payments on the loan and also make a living for their family.

So that was a good experience for me. I not only delivered water to the farmers, but I also delivered water to the city of Helena, who had a contract with Reclamation for municipal water. They took the raw water from our system and filtered it, of course, and treated it and used it. As I recall, we delivered about one-third of the city's need at that time. I think now they're probably taking more than half of the need of the capital city of Helena out of the Reclamation system.

We also had many problems on that Helena Valley Unit with farmers who had land that had already been waterlogged by previous irrigation from an old system. And over the years many of those farmers starved out, but a few people were able to acquire those lands from the people who starved out, and they put together pretty good-sized ranches. They were operating on a swamp-type pasture,

[3] The Crow Creek Pump Unit of the Pick-Sloan Missouri Basin Program was developed at the request of the Commissioners of Broadwater County for facilities to irrigate an acreage of land equal to that inundated by Canyon Ferry Lake before the land in the reservoir area was taken out of production. This acreage is part of the 23,400 acres of new irrigable land in the Crow Creek Unit of the Three Forks Division and the Broadwater-Missouri Unit described in Senate Document 191. Features include Crow Creek Pumping Plant, the Toston Tunnel, Toston Canal, Lombard Canal, and the lateral and drainage systems. For more information see, Jedediah S. Rogers. "Crow Creek Pump Unit: Pick-Sloan Missouri Basin Program," (Denver: Bureau of Reclamation History Program, 2008), https://www.usbr.gov/history/ProjectHistories/PSMBP%20Crow%20Creek%20Pump%20Unit%20D1.pdf.

high groundwater swamp pasture, flood-type irrigation. Well, when we came in, Reclamation, of course, had 160-acre limitation, and each individual could only irrigate 160 acres, and so some of the bigger ranches had to be broken up and sold off.

We came in and put in drain ditches and brought the water down below the root zone. Because of that, it left the old swamps that they were pasturing high and dry. Then they had the expense to go in and break up this unlucky swamp land that had been drained and rebuild the soil, level it, and try to make it productive, which was very costly.

Well, to make a long story short, there were several lawsuits against the Bureau of Reclamation because of this so-called over drainage. One of my assignments was to try to work with those farmers who were quite bitter. Some had signed up for the project, some had voted against it, but the majority in those days ruled. So, when the majority said, "Yes, we want the project," the rest of the people that owned land there had to go along with it. They had no choice.

Well, to make a long story short, some of the data that I was able to gather and provide for the courts actually won the cases for Reclamation, and we did not pay one dollar of damages that was alleged by these farmers because of over drainage. So that was a good experience for me and one that I think helped Reclamation, too. Then to go on further, the project was successful, and the farmers that are there now, I think speak highly of Reclamation and are glad to have the water. The timeliness of delivery of the water is important.

Another unique thing about the Helena Valley Unit was the way we got the water from the Missouri River to the land. That is, we had the Canyon Ferry Dam[4] on the Missouri [River], close to Helena, and then we used the hydraulic head that the dam created and ran the water through a big tube and drove turbines. Roughly about half the water would drive the turbine that was hooked to a shaft to the pump above the turbine. The pump would pick up the other half of that water in that tube and push it out up the mountain into a tunnel. Rather than using an electric motor, we just had a hydraulic turbine driving the pump, two of those. Of course, they were brand new, and after about a year and a half, everybody was curious about how these pumps were working and how the turbines were working.

So, one day I get instructions that winter to dismantle one of the units and inspect it, make sure that it's operating properly and that there's not any undue wear

[4] Constructed between 1949 and 1954, Canyon Ferry is a concrete gravity structure approximately 1,000 feet in length along the crest with a structural height of 225 feet. A key feature of the Pick-Sloan Missouri Basin Program, the dam is located on the Missouri River 27 miles downstream from Townsend, Montana.

on the bearings and so forth. Again, I need to repeat that I was only out of college two years and had never dismantled a turbine in my life or a hydraulic pump, for that matter. And I said, "Okay, I'll take the assignment. But where are the drawings?" Well, lo and behold, there were no drawings, as-built drawings, that we could find. And as I remember, the manufacturer of the turbines, we contacted those folks and asked if they had drawings. Well, no, they didn't have any that they could make available to Reclamation, but they would certainly send out an expert to help with dismantling the units, and the cost of the expert, I think, was $200 a day plus expenses. Well, in 1962 that was, in our minds, an astronomical amount of money.

So, the boss, who was located in Great Falls, said, "Rawlings, just do it anyway, and if you need some help from us or from the experts in Denver, why, we'll get you some help." So, to make a long story short, we did dismantle that unit and got along okay, made a report of what we found. The unit was in pretty good shape. There was some bearing wear that we corrected while we had it dismantled. For my career, that was another good experience that I had.

I think probably the most important thing for me and also Reclamation was the fact that I had the opportunity to actually run a Bureau project. Not too many people in Reclamation had that privilege to make it work. In other words, start the pump, fill the canal, run the water to the head gate at the farmer's field, and then to be involved with all the problems associated with that. Unfortunately, I think a lot of our design people should have had that opportunity so that what I learned there in the field I probably should have transferred into the design station in Denver and been able to use what I learned running the project to help do, I think, better designs of our structures. But as time catches all of us, things like that usually don't happen.

As a sideline on that, I can remember having people, design engineers, from Denver come to the field at, maybe, my request to help solve a problem. I remember one fellow. He'd been with the Reclamation, I think twenty years or more, and he had never been to the field to look at what he'd been designing. And I think that was a shortcoming in Reclamation that, frankly, I don't think we ever got a handle on, and I really emphasized that at every opportunity that I had, trying to get the message that we need to rotate people, especially designers who are going to actually design a canal or a pump or whatever, to have some opportunity to be out in the field and see how these things works so they can hopefully come up with a better design.

So, I had that opportunity. Then I spent three years in Helena as the manager of those two units, and then I was asked to transfer back to Great Falls and

take the position of what they called the project drainage engineer. Then my responsibility in that capacity was to investigate drainage problems on the projects in the project area and gather the field data that would be necessary to go ahead and design subsurface drainage system over the problem area and design the drains and various specifications, or help with that, at least, and size the pipe and place the grades on the pipelines that we put underground and then go ahead and let a contractor put in the drain.

I was in that capacity until 1968, when an opportunity in Billings, Montana–at that time it was a regional office. The branch chief of, I think they called it the Operation and Maintenance Branch, came open, and I applied and was selected for that job in 1968. So, I moved my wife and my family to Billings, Montana, and was in that capacity until 1974. Incidentally, my job in that capacity was to oversee the operation and maintenance of all the bureau projects, the existing projects, in the regional area, perform the review, operation, and maintenance of the projects, help the irrigation district managers and their boards of directors with operating problems.

Native American Affairs

Then in 1974, when Owen Dahlgren, or Bud Dahlgren, retired as the regional division chief of the water and land division, I was selected for that job and held that job until 1990, at which time I was selected as the Special Assistant for Native American Affairs of the Great Plains Region.

I need to go back a little bit. During my tenure as the regional water, land, and power supervisor, we combined three regions. First, we combined the Upper and Lower Missouri regions, headquartered in Billings. Then a year or two later, we combined that into what we called the Missouri Basin Region with the Southwest Region, which at that time was headquartered in Amarillo, Texas. So instead of having the Upper Missouri Region under my supervision–the water, land, and power part of it, at least–we took on four states. Then we expanded to seven states, and then to nine states. Most of the geographical land actually east of the Continental Divide to the Missouri River was in what was we call now the Great Plains Region. So, my responsibilities actually increased over those years that I was the water, land, and power supervisor. As a matter of fact, I started out as the water and land supervisor. Then as we combined these regions, the power function was brought into my division, whereas before it was a division by itself.

I think when it was all said and done, there were about forty-five or fifty professional people in my division, engineers, hydrologists, and soil scientists, land resource people, and contractor and repayment people, recreational people. We

handled all of those functions in that division.

Then in 1990, as I said earlier, I was selected as the Special Assistant for Native American Affairs. That was a newly created job. In fact, the then regional director, Roger Patterson,[5] and I had talked about because we have sixty-four Indian reservations or Indian communities in our regional area, we had a lot of Indian questions and problems coming into the region. It was just becoming a little overwhelming, actually, to Roger Patterson as regional director, and he needed a focal point for those Indian matters. I had worked with a lot of Indian people over the years as the regional water, land, and power supervisor and enjoyed Indian people and working with them. I told Roger that I would be interested in a job as a focal point for those Indian issues, and he said, "Well, let's think about that," and he did. He thought about it for a few months and finally decided that it was a job that he wanted to create in his region, and I was reassigned from regional water, land, and power supervisor to that position.

To give the job some visibility, I was directly under the regional director and my office was right next door to his. I think this was important to show not only the Indian people that we were serious about our trust responsibility to Indian people, but also demonstrated to non-Indian folks that came in that this was a very important thing to us and we were very concerned and obligated to fulfill our trust responsibility to Indian people. So that's the job that I held from 1990 until I retired September 2, 1994.

Storey: What kind of issues, first of all, caused Roger to be so involved with Indian matters, and then what kind of issues did you have to deal with in your own position and in your new position?

Rawlings: Well, that's kind of a good question and a very timely one. I'll go back to my old position as water, land, and power supervisor. I was kind of sitting on the other side of the fence. I need to go back and say that over time, I think inadvertently, Reclamation built a lot of projects that were above or on top of or immediately downstream from Indian reservations, and by doing that we actually took--at the order of Congress, of course–we took their land and their water and made it available to non-Indian folks.

END SIDE A, TAPE 1. NOVEMBER 16, 1994.

[5] Roger K. Patterson served as Regional Director of the Great Plains Region from 1988 to 1991. Mr. Patterson also participated in Reclamation's oral history program. See, Roger K. Patterson, *Oral History Interviews*, Transcript of tape-recorded Bureau of Reclamation oral history interviews conducted by Brit Allan Storey, senior historian, Bureau of Reclamation, from1994 to 2000, in Sacramento, California, and Lincoln, Nebraska, edited by Brit Allan Storey, 2011, https://www.usbr.gov/history/oralhist.html.

BEGIN SIDE B, TAPE 1. NOVEMBER 16, 1994

Storey: So, Congress had told Reclamation to build the projects and that resulted in the loss to the Indians of land and water in some cases.

Rawlings: In some cases. For example, I'll take the Milk River Project in Montana. We actually built one of the main storage reservoirs within the Black Feet Reservation. Congress, through an act of theirs, gave us the authority to go ahead and purchase the land from the tribe and then build a canal from the reservoir and bring the water across, actually, the Continental Divide and drop it into Milk River and run the water 250 miles, roughly, downstream to irrigate non-Indian land.

Storey: This would be from like [Lake] Sherburne [Dam][6] over.

Rawlings: Yes, the Sherburne over to the Milk River. The Blackfeet, over the years, began to realize that this land was taken from them, maybe at fair market value in those days, but back in the early 1900s the fair market value wasn't very much. None of the water from the canal was delivered to any of those people. Then when we got the water into the Milk River, we were on top of or adjacent to the Fort Belknap Indian Reservation near Harlem, Montana. And also in that basin was the Rocky Boy Indian Reservation.

Some of our facilities we did benefit the Fort Belknap folks. But it's ironic that that very reservation was the place where the Winters Doctrine[7] came from. You've probably heard of that. That was a lawsuit against a man by the name of Winters–not Winters, but Winter, but over the years it became Winters–versus the United States and that was the Fort Belknap Indian Tribe against that man for diverting water that they thought they should have for their reservation. To make a long story short, the federal courts gave the tribes enough water for their homeland. At that time, I said it was 125 second feet, or feet per second, out of the river. But I'm making it clear that that may not be the ultimate total amount that they would be entitled to.

[6] Completed in 1921, Lake Sherburne Dam is a compacted earthfill structure 107 feet in height above its foundation with a crest length of 1,086 feet. The dam is on Swiftcurrent Creek in Glacier National Park, about 6 miles west of Babb, Montana.

[7] "The federal reserved water rights doctrine was established by the U.S. Supreme Court in 1908 in *Winters v. United States*. In this case, the U.S. Supreme Court found that an Indian reservation (in the case, the Fort Belknap Indian Reservation) may reserve water for future use in an amount necessary to fulfill the purpose of the reservation, with a priority dating from the treaty that established the reservation. This doctrine establishes that when the federal government created Indian reservations, water rights were reserved in sufficient quantity to meet the purposes for which the reservation was established." Source: http://www.blm.gov/nstc/WaterLaws/fedreservedwater.html. (Accessed December 16, 2011)

Well, at any rate, that's an example of how Reclamation came in and then did what we were told to do by Congress, but rather than develop the land and water for the Indian people, we developed it for the non-Indians. It brought the settlers West. It was a social program, is what it was, and is. That was our early mission. Now, over time, we went into municipal industrial water delivery and all kinds of other things, but the initial mission was a social program to settle the arid West.

I'll have to say that Reclamation, at the request of the Bureau of Indian Affairs, did build several of the Indian irrigation projects for the Indian people, but we were actually doing it for the B-I-A and then the B-I-A would take it over and run it, and we were simply the engineers for that. Once it was constructed, Reclamation pulled out and the B-I-A operated the projects.[8]

The reason I use the Milk River [Project] as an example, as the water, land, and power supervisor for the region, if a problem came up with the Blackfeet or Fort Belknap or the Rocky Boys, that problem came right into my desk. Over the years, from 1974 to 1990, I had several issues that came in that I had to address and try to resolve. One example might be the Dodson Diversion Dam[9] on the Milk River. That was a diversion dam that we built to divert this Sherburne water that we brought across the divide onto the non-Indian irrigation land. We built the dam on the Indian land, and we inundated a reservoir and took about 2,500 acres for that.

The tribe really never got over the fact that that land was taken from them, some of their best bottom land, they claim, and I think they were right. The 2,500 acres could have been farmed by them, but it wasn't. It was taken away from them. There was some compensation, but they claim that they couldn't, nor could we, produce a receipt for payment for that land. And to this day, that receipt has never been found and the question is still up in the air. Did Reclamation really have authority to take the land, in the first place, and did we pay them for it?

So, over the years, we had to negotiate some interim agreements so that we could go ahead and operate our project and they could get on with their business, too. So that's an example of some of the problems that I did prior to getting the new job in 1990 as the Special Assistant for Native American Affairs.

When I took that job, I kind of switched positions, almost, and went to the

[8] During the early 20th Century, Reclamation constructed a number of irrigation projects to serve Indian lands in Montana: Blackfeet Project, Crow Project, Flathead Project, and Fort Peck Project. For more information see, Garrit Vossegger, "The Indian Projects," (Denver: Bureau of Reclamation History Program, 2001), https://www.usbr.gov/history/ProjectHistories/INDIAN%20PROJECTS%20OVERVIEW.pdf.

[9] The Dodson Diversion Dam, on Milk River 5 miles west of Dodson, Montana, is a timber crib, weir-type structure with movable crest gates. The structural height is 26 feet; the crest length is 8,154 feet.

other side of the table, and I became an Indian advocate, so to speak, and I still am. I think that the Indian people were really left out of development. We should have developed their resources right along with the other resources, because they needed it for a homeland, and they needed it for their young people to have a place to build a home and make a living for their families. And I think because that didn't happen, there's a lot of problems on the reservations that may have been avoided if we had done it differently. If they had a place to have a job and somehow to make a living, alcoholism, for example, probably would not be so much of a problem as well as other social problems that the Indian folks have--self-esteem, education. If they had the money to send their kids to college, I think they would be further ahead than they are today.

Reserved Water-Right Negotiating Team

So as Special Assistant for Native American Affairs, I was assigned on four reserve water-right negotiating teams. Now, these are teams that are appointed by the Secretary of the Interior, almost direct. It's a federal team usually made up of about five people, one from B-I-A, one from Reclamation, one from Fish and Wildlife Service, one from the Justice Department, and one from the Solicitor's Office. From that five, there's a chairman appointed, and I happened to be appointed as chairman of the Fort Belknap water-right negotiating team. And then I served as members to the Northern Cheyenne, Rocky Boy, Blackfeet negotiating teams.

Now, the function of the team was to assist the Indian tribe to negotiate a water-right compact quantifying their reserve water right with the state that they live in. In this case, it was Montana. We were not sitting at the table as a chief negotiator, the federal team wasn't, but we were there to facilitate negotiation between the tribe and the state. And during my tenure on those teams, we were successful. The team was successful in negotiating the Northern Cheyenne water-right compact, and we were getting into negotiations pretty heavily on Fort Belknap and Rocky Boy at the time of my retirement. Also, during that time, we worked a lot with the Crow people and the Wind River folks in Wyoming, Wind River tribes at the Wind River Reservation there. So that's to answer your question about the difference in the jobs.

Storey: What did negotiating these reserve water rights involve?

Rawlings: Well, under the Winters Doctrine, basically it says that under the treaty that the federal government signed with just a nation of people, they were entitled to land and water and resources sufficient to have a homeland for themselves. At that time, back when the treaties were negotiated in the late 1800s, water wasn't quantified.

The land was pretty much quantified within the boundaries of the reservation, but the amount of water was not. So, the reserve water right is a quantification of the Winters Right for each tribe.

Now, that does several things. It gives the Indians a quantity of water that they know they own forever, and they can go ahead and develop that. It also tells the non-Indian in the particular basin how much is left for him or her. So, they can go ahead and develop if there's any left over. Or in some cases, some of the water that the non-Indians have been using would come back to the Indian tribes and the non-Indians will have to come offline. Non-Indian folks have contracts with Reclamation for delivery of so much water. So, you can see what's on the horizon. There's going to be, in my opinion, some lawsuits from the non-Indians because we promised them so much water under their contract. Now we, the government, are going to come in and pull that away and give it to the Indians, because that's what they're entitled to. And the non-Indian is going to say, "You guys breached our contract. Therefore, you're liable for our damages." That, to my knowledge, has not happened, but it's in the future. It's going to happen.

Storey: When you were on these teams, what were you doing specifically? How were they working? How were they functioning?

Rawlings: Okay. The team actually worked for a person in Washington, D.C., and that person's title was–well, the first one that I worked for was Tim Glidden [phonetic], and he was the chairman of the reserve water-right negotiating group that was formed up in Washington, D.C. They called that the working group. That working group was made up of Tim Glidden, and his position at that time was the immediate personal counsel of Secretary of the Interior [Manuel] Lujan.[10] Lujan was the head man, of course, for Interior, and right under him was Lujan's attorney; this was Tim Glidden. He was the chairman of the working group.

Under that person, we had working group members, and they were the five or six assistant secretaries for Water and Science, Fish and Wildlife, Land and Minerals, two or three others. Those five positions were team members under Glidden, as chairman.

That working group then appointed these teams that I was a member of and chairman of one, and we got our marching orders from the working group on what our function was out here in the field. Basically it was to gather technical engineering data, scientific data, whatever you needed, hydrology and all that, in the basin, to, number one, determined how much water was available in the whole

[10] Manuel Lujan served as Secretary of the Interior under the administration of President George H.W. Bush, 1989-1993.

basin and how much was appropriately to be given to the Indians for their reserve water right, and then how much would be left over for non-Indian use, not only for irrigation but M&I (Municipal and Industrial), Fish and Wildlife, in-stream flow, pollution abatement, or whatever.

Our job as chairman and as team member, we either gathered that data ourselves, but most likely we delegated that down to people in our respective organizations. Like Reclamation might use hydrology for the studies and the engineering on how to get the water from Point A to Point B, and the B-I-A folks might determine both the Indian ownership and non-Indian ownership and so on. It was a team effort, and we gleaned all this help from the respective people in these various agencies. Fish and Wildlife and the NEPA [National Environmental Policy Act] document and workers, a lot of it handled by the Fish and Wildlife folks in conjunction with Reclamation and B-I-A. It was a team effort. It was really quite an organization. Not much structure, but the organizations funded their own people on these teams, and some of the money was given by the working group to the teams to do their thing. Mostly, though, the money was given from the working group to the respective organizations like Reclamation, B-I-A, and Fish and Wildlife, and then that money was handled at the Washington level and allotted to the regions as they needed it for their work. That's how they were funded.

When I started, the allocation of money for my position and work that I was assigned to do was zero. When I left, it was right at a million dollars annually, and I'm sure it's a million and a half now, probably, and it will keep building, because so much money and person power is needed to do this committee work, teamwork, to come up with the numbers, to be able to negotiate, at the negotiating table with the state.

Now, the position of a state is quite unique in they feel that they have to protect the non-Indian water user, and, of course, the federal government is supposed to protect the Indian. So here you have the two sides, really. It's ironic to me and always has bewildered me a little bit that the state doesn't consider the Indian a citizen of their state and be in a position to help protect them as well as anybody else. They don't. This we/they situation, or the non-Indian they're protecting, and the federal government is protecting the Indian. So right away you have these two positions that you deal with.

Storey: How do the negotiations start?

Rawlings: How do they start?

Storey: Uh-huh.

Rawlings: It has to be requested by the tribe. The tribe goes to the Secretary of the Interior in writing and writes this letter and says, "We are in a position that we want to negotiate our water-right settlement in lieu of litigation." The letter goes to the secretary, and he gives it to the working group chairman. If everything is in order, the chairman appoints the team. Incidentally, there's a series of instructions that the team functions under. These instructions came out in the *Federal Register*, and so they're almost like law.

In those instructions, there's four phases, I believe. Phase one is for the team to prepare what we call a fact-finding report, and the team gets real busy. We put this report together that lays out all the facts of the negotiation. It describes the tribe and the membership and the topography of their land and how much water is available and where the Indian people really came from many years ago, why they live where they live, talk about the treaty that they have, and lay out all the facts. We don't try to give any opinions or anything like that in the fact-finding report. The Indian people also contribute to that report. This draft is sent to the working group. The working group looks it over and if it looks okay, then it's finalized.

Then the next thing the working group asks the team to do is to prepare what we call an assessment and recommendation report. That's the second phase and the second report, and that then pulls together the position that the federal team thinks we should negotiate under. For example, the federal team might say something like this, "There's 500,000 acres [feet] of water in the basin annually that's available for all use, and because the Indian people have so much population and so much land area, they need 300,000 acre feet of that 500,000, total." Then we justify why they need that much, and we recommend to the working group that we be given the instructions to negotiate somewhere in that range, 300,000 to 350,000, maybe down to 250,000 or something like that, give us a range to negotiate.

We put these recommendations in the report and send it to the working group and they look it over, and if they agree with what we've said, then they write an order for us, in writing, a letter that says, "You may proceed with negotiations under these parameters." And they say, "You can negotiate in a range of maybe 250,000 to 300,000 acre feet of water." At that point in time, then we can actually seriously start negotiations. Before that recommendation and report is prepared, we really don't have the authority to negotiate with anybody or even sit down at the table.

Of course, in the meantime, the state and the tribe are beginning to take positions, and they get antsy, and they don't like to wait for us. But the tribe knows

that without the help of the federal government, they're not going to be real successful, and the state finally realizes that they've got to deal with the federal government team as well as the tribal team or nothing's going to happen. And so finally, when the assessment and recommendation report is finalized, that is an in-house document that only Interior people see. The tribe doesn't see it. The state doesn't see it.

Then the negotiations begin, and the state and tribe agree that on a certain day they'll meet in Helena, Montana, or up on the reservation or in Billings or someplace else, and they'll have a formal negotiating session. The tribe brings their team, the state brings their team, and the federal team sits at the table. The public is invited. They can come to any of these meetings. They're open meetings. But the public does not have input until at the end of the meeting. Then they're asked if anybody has anything to say. And many times, we would get input from farmers and city folks who are concerned about losing their water right. So that's kind of how the negotiation happens.

Northern Cheyenne is the best example I can use, because it started and we finished it in, well, about a three-year period that we negotiated. As we approached the end of our negotiation, the meetings became almost weekly, and the negotiations and the give-and-take seemed very intense. And finally, we came up with a document that the three groups could agree to. That then is put in the form of draft legislation, and it goes to Congress, and Congress passes the bill that actually sets forth the so-called water-right compact with the tribe and the state.

Storey: Do you remember the citation for the regulations that you mentioned?

Rawlings: I don't remember, but I can give you a copy of it. It was, I think, 1990. *Federal Register*. I can't tell you the day and all that.

Storey: It sounds to me as if there is a lot of communication between the federal team and the working group. How efficient was that communication? Did it take a long time to get answers back from the working group, or was it done quickly, or how did that work?

Rawlings: It varied. But it was a problem. We would send an assessment and recommendation report to the Washington level, and it may have been six months before we'd hear from them. Of course, in the meantime, the state and the tribe were getting very anxious to get on with the negotiations. So, yes, that was a problem, although not an insurmountable one. Really, when the chairman of the team began to get concerned about the delay, we would pick up the phone and call the chairman of the working group and say, "Here's the problem. We need to get

back there and talk to you folks and jar this thing loose so we can get us the perimeters under which we're allowed to negotiate."

One of the things that prompted this type of pressure from the field to the Washington level was the fact that in Montana the legislature meets every two years. So, the tribe and the state would try desperately to get ready for that next session. If they missed the session, then they'd have to wait two more years before they could bring it before the state legislature, unless a special session was called to address the compact. For that to happen probably would not be very likely. So that gave us some guide-ons out there, time frames, that the teams knew that if they missed the session last year, then they have two years to negotiate to be ready for the next session.

The compact had to be addressed by the tribal council and the tribe, approved, then the state legislature had to approve it and pass the bill, similar to the feds, and then the package went to Washington, and the federal government passed an act. That's the way the Northern Cheyenne was handled. And I think all of those will probably be handled much like that, no matter where you're at.

The [Department of the] Interior didn't want to approve of a compact unless the state and the tribe had already approved it, and I think that's logical, the way it should be, not to hand it to the Congress unless the people in the field can live with what's there. So that's how that was handled.

Storey: Let's go back to Great Falls. When you first went there, who was the project supervisor, project manager?

Great Falls Project Office

Rawlings: Harold Aldrich[11] was the man that actually hired me full time, right when I got out of college. He, shortly after that, was transferred to Amarillo, Texas, so I didn't really get much chance to work with him then. He went to Amarillo, Texas, as the water and land supervisor in the regional office there and then later became the regional director in Billings.

Storey: And this is Aldrich or Ridge?

[11] Harold E. Aldrich served as the Upper Missouri Region's Regional Director from 1964 to 1973. Mr. Aldrich also participated in Reclamation's oral history program. See, Harold Aldrich, *Oral History Interview*, Transcript of tape-recorded Bureau of Reclamation Oral History Interview conducted by Brit Allan Storey, senior historian, Bureau of Reclamation, March 7, 1995, in Billings, Montana, edited by Brit Allan Storey, https://www.usbr.gov/history/oralhist.html.

Rawlings: Aldrich. A-L-D-R-I-C-H.

Storey: Okay.

Rawlings: Harold Aldrich.

Storey: Who replaced him?

Rawlings: Who replaced Harold?

Storey: Yeah.

Rawlings: A man by the name of Bob McPhail.

Storey: Bob McPhail. In Great Falls?

Rawlings: No, no. I'm sorry. I thought you meant as regional director. In Great Falls, a man by the name of Mike Drazich.

Storey: And how do you spell Drazich?

Rawlings: D-R-A–I'll write it down. I think it's D-R-A-Z-I-C-H. Drazich. Michael Drazich.

Storey: Now, is he the one who asked you to move to Helena and take over the project there?

Rawlings: Yes.

Storey: Did he give you any choice about whether or not you would go to Helena?

Rawlings: Well, I was called in and given the opportunity to tell him and my immediate boss, who was Bruce Garlinghouse [phonetic]–he was the former chief there–whether or not I thought I could handle the assignment, and I told him I thought I could. So, yeah, I did have that opportunity. I think if I'd had said, "Gosh, I don't want to move. I don't think I could handle that responsibility," I think they would have found somebody else. I don't think they would have forced me down there.

Storey: Did you have any special projects or anything that kind of caught their attention while you were in Great Falls?

Rawlings: Well, I did a lot of work on my own. By that I mean I would leave the office on Monday morning in Great Falls, and I would take a drill rig and a truck and go to

somewhere in the area, the project area, that we were investigating for construction called the Jefferson Whitehall Unit [phonetic], and I would spend the whole week drilling test borings, deep holes, and logging the material that came out of these test wells, installing pipe.

In that job I had to contact a lot of people to get permission to drill on their land, and those people happened to be the very folks that were relocated out of the Missouri River bottom to build Canyon Ferry Dam, and they were very bitter because they lost their ranches, and they were bought out and they were moved to higher ground. Those very people, I had to go into their farmsteads, knock on their door, and ask permission to drill a hole on their new land. I can remember many times they'd sic the dog on me, or they'd swear at me and slam the door.

END SIDE B, TAPE 1. NOVEMBER 16, 1994.
BEGIN SIDE A, TAPE 2. NOVEMBER 16, 1994.

Storey: This is tape two of an interview by Brit Storey with Jim Rawlings on November 16, 1994. So, you were going to these folks' farms or ranches and asking permission to drill.

Rawlings: Yes, and I had the map and laid out on, I guess, the hood of my truck, and the father and I, and this little son that was there, too, we were busy looking at this map, and the little kid snuck around and climbed up on the cattle loading chute and urinated on the map.

Storey: Really didn't like Reclamation, huh?

Rawlings: Now, whether he was told to do that by his father, I don't know. I thought about that for a long time, and I finally decided in my own mind that the kid must have been coached to do that. The kid was five or six years old. He wasn't very old. I told that story because of the bitterness that was in the heart of these people that had to be relocated for the benefit of all the people in the basin to build this big dam and reservoir.

Storey: When you say they were relocated, does that mean that Reclamation bought them a new ranch? How does that work? Or do you know?

Rawlings: It usually went this way, and the reason I know is because as water, land, and power supervisor, I was responsible for all land acquisition in the whole region. And usually, let's say you had a 500-acre ranch at the bottom of the reservoir, and you had to be bought out. We'd buy the land and pay the person the fair market value for the land and the improvements. Then they had the choice of taking that money

and buying a new ranch, wherever they could find it, or taking the money and going into the gas-station business in Timbuktu. I think Reclamation felt that that was the better way to do it. That way the individual had more control over his or her destiny. We didn't try to go out and find a suitable ranch for somebody else and replace it. It just would have been impossible.

Storey: So, this just happened to be that you were working in an area where there was a concentration of people who had been displaced by Reclamation?

Rawlings: Many of them did buy land above the water line of the new reservoir, or they had some left. We bought part of their ranch, and some of it was above the high-water mark, so they kept that. And then we'd come along a few years later and say, "We're going to build a canal above this. We're going to irrigate all the land here, and we want to drill these holes so we can find out if the land is irrigable and drainable."

So that was quite a challenge for a young guy right out of college. I was successful in getting every hole we needed. Maybe that was one of the things that tipped the scale in my favor to get the opportunity to go to Helena.

Storey: How did you convince them, with all this hostility? You had to go back, I take it.

Rawlings: Yes.

Working the Drill Rig

Storey: Talk to them again after you'd been run off.

Rawlings: Oh, yes. The way I did it, as I recall, if a particular person–say, I needed a line of holes, and they're usually spaced, let's say, a quarter of a mile apart, this line of holes, from the top of the slope down to the bottom, and this ranch would be in between, and I'd have some holes above and some holes below his place. I'd drill those first and he could see the rig out there day after day. And then after a while, I would make another try at visiting him or her, and finally I'd work my way into where they would talk to me. And then I would give them all the respect in the world and tell them that I realized that there were bitter feelings about the reservoir, but time was marching on and my job was to try to help build this new project, being able to put some of this water to use, and that they were under no obligation other than just to give me permission to drill the hole, and if there was something that I could do for them like, for example, if we had to take a fence down to get our drill rig in to the site to drill, I would make sure that I promised to rebuild that fence and to plug the hole so that their cattle wouldn't fall in the hole. Things like that.

Clean the area up and leave no mess. I would even occasionally leave an extra post or two after repairing the fence, just inadvertently leave them laying there. I suppose they would use those posts someplace else, and hopefully that helped to ease the tension and demonstrate my willingness to try to do a job that's fair and accurate. Really, I probably shouldn't have been giving away fenceposts, but I did give away a few, and I think it paid off. I think in the long run that it was a good expenditure for the government.

Storey: Now, what I understood you to say was that you went out by yourself without anybody else on a drill rig?

Rawlings: No, we had a drill crew, and I was the leader of the drill rig and I told them where to drill the hole and all the technical engineering aspect of that operation.

Storey: How many people would be on a crew like that?

Rawlings: There would be four on the drill crew. There would be the crew chief and three drill helpers, as I recall. I would be the fifth person on the five-person effort or team.

Storey: And you would site the holes and do the talking with the landowners.

Rawlings: Get permission. And all the driller had to do was I'd tell him to drill the hole right there, and he would set up his rig and drill the hole and put the core from the drill, the core of the soil sample, in a box, foot by foot. I would take that box back to Great Falls in a truck that I drove, and I either logged the hole or our geologist would log the hole. By that I mean you look at the material in this core sample and you write down what you find. Like you might have the first foot would be loam soil, and then you go into a clay loam for three feet, and then you'd go into clay, and then hard rock and so on. Those well logs are still available today that I was responsible for getting, for example, as is any other drill log that anybody else took for Reclamation.

Storey: How large an area did you survey this way?

Rawlings: Well, it was from Dillon, Montana, basically, to Canyon Ferry Dam, which is a distance of about some 200 miles. And we had canals and dams bringing this water from the headwaters of the Missouri [River], kind of, in a canal, and irrigated pieces of the ground along the way, clear to Canyon Ferry Dam.

Storey: I mean, 200 miles is an awful lot of territory to be drilling a hole every quarter mile in every direction.

Rawlings: Oh, well, yeah. Maybe I misled you a little bit. We would delineate the areas that we knew could be irrigated from the canal that we had in mind of building, and then there would be a block of land that might be 20,000 acres, and this block and the next block, after your canal would flow for twenty miles, would be another block of 50,000 acres, and so on. So, it was just patches along the canal route. My assignment was to drill these holes in those areas.

Storey: Done on the basis of preliminary survey work of some sort.

Rawlings: Uh-huh.

Storey: And preliminary design and so on.

Rawlings: That's right.

Storey: And how long did you stay on the drill rig doing that kind of work?

Rawlings: Well, I would go. We would just start and every week I would leave home in Great Falls on Monday, and I'd get home at six or seven at night on Friday night.

Storey: Did you do that for the entire two years that you were at Great Falls on that first assignment?

Rawlings: Basically. I did mostly that. I did some other things, too, but occasionally I would get to stay home for two or three days with my family, but mostly I was traveling.

Storey: Was your dad still assistant regional director then?

Rawlings: No. When I came on in 1960, he, at that time, was the water and land supervisor in Billings. During the 1953 RIF [Reduction in Force]–I don't know if you're familiar with that or not.

Storey: No, I'm not.

Rawlings: That was the [Dwight D.] Eisenhower RIF, they call it. There was a lot of RIF and reduction in force in Reclamation and all government. He was the assistant to the regional director at that time, and he was shifted from assistant regional director to the water, land, and power supervisor job.

In 1960, when I came on board full time, he was transferred and became the project manager of the Columbia Basin Project[12] in Ephrata, Washington. So, when

[12] The Columbia Basin Project (CBP) is located in east central Washington and currently serves about 671,000

I came on board full time, he left the region. And he was out there for ten years as the project manager of the Columbia Basin Project and the Grand Coulee Dam. I'm a bureau brat, they might say.

Storey: But you never lived in bureau housing?

Rawlings: No.

Storey: Okay. Tell me about Helena, state capital and all of that. Did you have any political involvement in that position as the project manager there?

Project Manager in Helena

Rawlings: Yes, I was Reclamation's representative in that area, and anything that came up politically that I was capable of handling, that was my assignment. I was the front man for Reclamation, and I answered many, many questions from politicians, state senators, and the like, city officials, the mayor of Helena, for example, mayor of Toston and those communities.

Storey: Of course, they had water supply coming from our projects.

Rawlings: Those kinds of questions came first to my office. If I could handle them locally, I would. If it was something that I needed more information on or couldn't answer, then I would go to my supervisor, who was in Helena–excuse me, Great Falls. If they couldn't answer it, then they'd go to Billings, to the regional office.

Storey: So how many projects did Great Falls control or supervise?

Rawlings: Well, let's see. We had, well, Helena Valley and Crow Creek, Milk River, Sun River,[13] and East Bench[14] at Dillon. Five.

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acres, or approximately 65 percent of the 1,029,000 acres originally authorized by Congress, in portions of Grant, in Lincoln, Adams, and Grant Counties, with some northern facilities located in Douglas County. Principal project features include Grand Coulee Dam, Franklin D. Roosevelt Lake, Grand Coulee Powerplant Complex, switchyards, and a pump-generating plant. Primary irrigation facilities are the Feeder Canal, Banks Lake, the Main, West, East High, and East Low Canals, O`Sullivan Dam, Potholes Reservoir, and Potholes Canal. There is over 300 miles of main canals, about 2,000 miles of laterals, and 3,500 miles of drains and wasteways on the project. For more information see, Wm. Joe Simonds, "The Columbia Basin Project," (Denver: Bureau of Reclamation History Program, 1998, https://www.usbr.gov/projects/pdf.php?id=88.

[13] The Sun River Project is composed of the Greenfields and Fort Shaw Divisions in central Montana, west of the city of Great Falls. Principal features are Gibson Dam and Reservoir, Willow Creek Dam and Reservoir, Pishkun Dikes and Reservoir, Sun River Diversion Dam, Fort Shaw Diversion Dam, and nine canal systems. For more information see, Robert Autobee, "Sun River Project," (Denver: Bureau of Reclamation History Program, 1995, https://www.usbr.gov/projects/pdf.php?id=198.

[14] The East Bench Unit of the Pick-Sloan Missouri Basin Program is in southwestern Montana, along the

Storey: How large would the Great Falls office have been, do you suppose?

Rawlings: People-wise number?

Storey: Yeah. Just in Great Falls, I mean, in the project office.

Rawlings: In the project office, when I first signed on in 1960, I think there was somewhere in the range of 150 to 200 people. Big office.

Storey: Do you have any idea how many out in the sub-projects that were under that office?

Rawlings: Oh, let's see. The construction crews were on board at Helena. They were just finishing up the work. So, there were probably twenty-five there at that time. During the peak of construction, there were many more than that. The Crow Creek Unit had been finished. It was a small unit of 5,000 acres. But the Dillon project called East Bench Unit was just beginning to start construction, and there was a big force there. I suppose in East Bench there may have been 100 people, somewhere in that range, at the peak of construction. I could be off on that number twenty-five positions, I suppose, one way or the other, but that's a guess.

Storey: Now, when you went to Helena, basically, I guess, you were the first project manager.

Rawlings: Yeah.

Storey: How many people were on the staff of that project?

Rawlings: Eleven.

Storey: Eleven people. Two years out of college, huh? (laughter)

Rawlings: Yeah.

Storey: That's great.

Rawlings: Yeah.

Storey: What other kinds of things did you do besides what you've already mentioned?

Beaverhead River. The unit provides full irrigation service to 21,800 acres and supplemental irrigation service to 28,000 acres. Principal features include Clark Canyon Dam and Reservoir, Barretts Diversion Dam, East Bench Canal, and a system of laterals and drains. For more information see, Jedediah S. Rogers, "East Bench Unit, Three Forks Division: Pick-Sloan Missouri Basin Program, 2008, https://www.usbr.gov/projects/pdf.php?id=159.

You mentioned taking apart the pump.

Rawlings: You mean while I was there?

Storey: Yeah. And you mentioned some of the negotiations with the landowners. What kinds of problems did they come in with to be solved, for instance?

Project Office Issues

Rawlings: Well, all kinds of problems, from weed control on the ditch banks. Our job as operators was to manage the weeds on the right-of-way of the canal. But sometimes, at least, we were accused of causing the weed spray to drift off of our right-of-way and damage some trees that they had planted or flowers or a garden, and the landowner would complain to me about that. They'd want to be compensated. Another real big problem was the design of our cattle guard. Are you familiar with the cattle guard?

Storey: Oh, yeah.

Rawlings: Okay. The bars across. The livestock is supposedly not to cross.

Storey: They'd look down and they can't bring themselves to cross it, because they can see through it.

Rawlings: That's what you hope in your design. Well, for some reason, the design that we had and used there, the horses thought they could make it across. They would start across and their feet would go between the bars. They were spaced four inches apart at the bottom of the bar, but the top of the bar was narrower. The cross-section of the bar looked like that, kind of a bell-shaped, and that was nothing more than a chute for the horse's foot to go down between those four-inch bars, and then as soon as the horse got its foot in there, it would lunge and break the leg, compound fracture of all four legs just like that.

Many mornings or evenings I would get a phone call, and a mother or a father or a little child would be hysterical about their horse is caught in this cattle guard and would I please come out and help them get it out. So, I'd rush out there and, of course, there was nothing that could be done for the animal. You had to just put it down and destroyed. I can remember many little girls or little guys standing there crying, mad because we had put this cattle guard there.

So, everybody thought they had a prize horse, and they immediately wanted to be paid for this horse. My job was to get all the facts and send a report

to the regional office in Billings, with a copy to my boss in Great Falls, and a recommendation on what to do. Was it Reclamation's fault the horse got in the cattle guard and was killed, or was it the landowner's fault because the horse got out of the pasture fence and was trespassing and so on?

Then the legal people in Billings and the regional office people, too, I think, would decide whether or not we were liable. In every case, it came out that we were not liable, and then my job was to go out and tell the folks that, "In our opinion, your horse was trespassing, and we are not liable. Therefore, the government cannot pay you any money." And that was not an easy task, but that was my job and that's what I did.

It happened so many times that I had a deal with the local veterinarian, that as soon as a horse was in the cattle guard, I would immediately call him or have somebody in my office call, and he would rush out and inject sodium pentothal in the animal and take its life quickly and humanely and help me cut the thing out of the cattle guard.

So, then the designers began to say, "Well, Rawlings, what can we do to fix this so even if the horses did trespass, how can I fix these cattle guards, so their feet won't go through the bars?" And I said, "Well, we can weld a re-bar, a rod, of steel, and reduce that four-inch opening to a two-inch opening. If the horse chooses to go across, they'll make it, and they won't get caught. And I could care less if they are in the other guy's field. I just don't want them to get hung up on our cattle guard." That was one design change that I recommended.

Another one, I said, "You need to have a ramp from the road level, we need a ramp up and have that cattle guard up so that when the horse approaches, or the animal, approaches the cattle guard, its rear end is down and its front end is up and give me as much depth in the pit below the bars as possible so that hopefully the animal can sense the depth there, probably created by the change in temperature, I think, of the pit, and they won't try to go across."

So, we modified many of those, in fact, all of them, and put the bars across and raised them up, an approach on both sides and a ramp, a dirt ramp, and it seemed to eliminate the problem. This is why the designer needs to be out in the field. I told you earlier. It's a very good example of what I'm talking about.

What else? A lot of times the turnout to the farmer's field, they thought, was in the wrong place, or it wouldn't be high enough to get the water out of our ditch and get on his field where he wanted it. A lot of times in a field, let's say, an eighty-acre field, we would tell him that only sixty acres of his eighty acres

was what we called irrigable. The rest of it is not good enough land to irrigate. He would argue with me that, "Yes, the whole eighty acres is good enough to irrigate and I want water for eighty and not sixty." I would have to negotiate that argument to conclusion, hopefully, trying to convince the landowner that, yes, Reclamation was right, and they were wrong. Many times, I found that Reclamation had made a mistake, and it was my job to change the land from non-irrigable to irrigable status.

Storey: Reclassify it.

Rawlings: I didn't always do that by myself. I would have a land classifier to come in and do the–this is a long story.

Storey: Please tell me.

Reclassifying Land

Rawlings: I'm a drainage engineer and my job was to take care of the water from five to ten feet of the soil. A soil scientist's job was to classify the land from the ground surface down five feet. If he said that first five feet of the soil profile was adequate for sustained irrigation, and he would classify it into an irrigable class, then the drainage engineer would come along and we'd look at the next five feet or deeper, and we would tell our supervisor that the land was drainable, economically drainable.

When you put water on the ground artificially and irrigate, you might put on six inches, and maybe five and a half of those six inches would go the crop for growth and [unclear]. A half an inch of that six inches, or five inches would go past the root zone and go into what we call the groundwater table. And as you irrigate and put this water on, the groundwater table many times rises and rises and rises and waterlogs your land and seeps you out. So, then you have to put in artificial drains, and that was the drainage engineer's job.

That's what my initial training was, drainage engineer. So, I would do that part of it. I would tell the soils manager. If he said the top five feet is okay, I would say yes or no about the drainage. If it needed drainage, I would estimate how many dollars it would take to drain the land so that the water table would never come into what we call the root zone, and that was the top four feet.

Storey: So, say the turnout was in the wrong location for what the farmer wanted or needed. What does Reclamation do about that, or do we?

Rawlings: Yeah. There was basically two answers. One was we'd classify the land based on the elevation of our turnout. So, if I turn the water out to your field, the water will run and be able to even irrigate what we call irrigable land. You don't have to pay for that land above that line. But he wanted to make use of the whole eighty instead of the sixty, so he would level his ground and try to push the water up on as high as he could get it. When he did that, then that would put a hydraulic head on the turnout, and you couldn't get enough water out of the turnout to satisfy the need for the eighty acres. So, if I found that we put the turnout in the wrong place, we'd change it and put it where it belonged. If we put the turnout where it was supposed to be and he could irrigate the land that we said was irrigable, then we left it alone and he had to adjust his operation to that, to that location.

Storey: Did we ever, for instance, have to put in checks in order to raise the level of the water in the canal and things like that?

Project Engineering

Rawlings: Occasionally that was part of my job. Being an engineer there operating the project, I would notice if there was a deficiency, and I would recommend that that be done. Another thing that I would recommend would be lining a canal, make it impervious, to try to get water down the canal. It was so impervious that you'd lose more than you could get to the end, and so I would recommend to my supervisor in Great Falls that we've got to line, next fall we've got to line this canal, with membrane or concrete or whatever we decided to use. That was also part of my work.

Storey: Did you have a budget for your project?

Rawlings: Yes.

Storey: How did you go about creating that budget and processing it through?

Rawlings: Well, I would actually develop the budget. I knew how many people I had to pay. I knew what that cost. And then I knew how many miles of canal I had to spray for weeds, and I knew how many cattle guards I'd have to fix and so on. I'd estimate all those costs. I knew how much money I thought I would need to do the drainage investigations and how much money it would take for the soil scientists to come out from Great Falls to do the soils. So, I added all that up, and I developed a basic number, total, and then we'd add on all the additives that we normally add on like for leave, annual leave, sick leave, and all that stuff, and we came up with a budget.

Storey: And then what did you do with the budget you proposed?

Rawlings: Well, I'd send it to Great Falls and then they would look at it and, of course, they would have to adjust it a little bit. (laughter)

Storey: Just as a matter of principle, you mean?

Rawlings: Sometimes they would raise legitimate questions, or maybe I was too high or low on a certain line item. But then we negotiated that, and in the end, we came to a final budget. Then we had a cost authority for each one of those line items: drainage, soils, operation and maintenance, pump repair, and so on. And my job was to stay within that budget. One of my jobs.

Storey: Were you able to stay within your budget?

Rawlings: Well, usually, yeah.

Storey: Did you get what you asked for?

Rawlings: Usually did. A lot of times, other people would use your money without your knowledge, charge against a certain cost authority, and that would raise some problems for me, or for the whole outfit, actually. That still happens today.

Storey: How could they get away with that?

Rawlings: Well, maybe the soils guy came down that I asked to come down and I had planned for him to work three days in the field, and I knew that his cost for his equipment and so forth was so much and he'd have so much per diem and so much automobile expense, and I knew about what it would cost per day for that individual. Well, then maybe he would go home and instead of working one day putting his notes together, he might have to work four or five that I didn't anticipate, nor maybe he didn't. But he would go ahead and work those anyway. And, lo and behold, I'd get this bill and find out that he spent more than I had anticipated, that he or she had spent. That's usually the way it happened.

Storey: You didn't have any O&M problems beyond lining, I suppose, since this was a relatively new project?

Project Issues

Rawlings: Well, you always had a problem with pump capacity, whether or not you had enough water in your system to deliver at peak demand. That's a critical thing. By peak demand I mean, let's say, in the middle of August everybody on the whole project wants to water. The thing is designed so that there's some rotation built into

your delivery. It's not like the tap in your home. Everybody in Billings, if they wanted to, can turn the tap on at the same time. It's designed for that. On an irrigation system, usually you're designed for maybe somewhere in the range of 20 percent of the people would not be on-line, so you don't have to build a ditch quite so big. Saves money. Well, when these peak periods come, everybody wants to water their hay or their barley or whatever they're raising at the same time.

Then is when the phone gets real busy in your office, and you're there day and night trying to accommodate all these people. And we had certain regulations and rules that the farmer had to follow. One, he had to give us forty-eight-hour notice for a turn-on and a twelve-hour notice for a turn-off. We were glad to have him turn off, because we would take that water and move it down to the next turn-on. But if he would walk in the door and say, "Turn me on right away," we wouldn't maybe have the water available to him. If he was ten miles down the canal, I'd have to turn the pump up a little bit, put the head in and get that water down to his head gate ten miles downstream, and it might take me six or eight hours to get that done, or a day or whatever, depending on how far along the line he was on.

Then another real acute problem we had was wind-blown weeds. Because there was so much new farming and new construction in the area, a lot of weeds grew initially on the ditch banks and on the farmers' ground. The name of the weed that gave us the most trouble was the Jim Hill Mustard plant. It was a tall bushy plant with a thick stem. That thing would grow up–

END SIDE A, TAPE 2. NOVEMBER 16, 1994.
BEGIN SIDE B, TAPE 2. NOVEMBER 16, 1994.

Weed Problems

Storey: So, the Jim Hill Mustard plant was the worst problem.

Rawlings: Yeah. The wind would come along and break those stems off, and then the weeds would roll like tumbleweeds–and we had plenty of those as well–and they would fall into the ditch, which was full of water. Then the weeds would float downstream and jam into a check or a drop structure and plug up the canal and it would overflow and wash the canal bank out and destroy the canal entirely or flood some guy's farm and drown some animals.

My job was to get the plug out of the canal as quickly as I could, repair the hole, get the water back online, and then negotiate a settlement if we'd damaged somebody.

Storey: How could you find out that you had a problem, a blockage or an erosion problem or whatever?

Rawlings: When you're on a job like that, you live the job. Even if you're home at night, I could be home at night actually in bed and I could hear the wind start to come up, and I would immediately get out of bed and get in my truck and go out and monitor the canals, as well as my foreman would do the same thing. He and I had such a neat relationship that we just knew that the other guy was on the lower end. He'd come from the lower end, and I'd start at the head end, and we'd drive that canal all night if we had to, if the wind was blowing hard, so that we would be able to find these weed plugs before they damaged the canal. And you'd always have to shut the canal off if you were plugged at some point. You can understand that. So that we had to do during the night, too. Either shut the pump down or we had a waste way, an emergency place where you could dump the water rather than let it go down the canal against the plug. We'd siphon off into our wasteways, and then we'd get our drag line out there and we'd bail these weeds out of that structure.

One time we went out and we had a pipe drop. Instead of a weed plug, we had a Holstein cow that had drowned and went right head-first into that pipe and got stopped, just like a cork in a bottle. Well, you can imagine trying to get that dead cow out of that pipe. We had to get the canal water shut off, get some of the head off the area so we could get to the cow, and then you had to literally go in and cut the cow in pieces and take it out. I recommended some design changes there, too, because of those problems.

You have two kinds of drops. One is a vertical drop where the canal just comes and drops into a basin and the water goes on. Then you had a pipe drop. Some designer decided that was a neat way to do it, less money. And at the end of the pipe, he'd put a baffle. The water would come down the pipe and hit that baffle and boil and dissipate the energy and then the water would flow on downstream. Well, that was a wonderful design except they forgot about the weeds and the cows, because those weed plugs would come against that baffle and they'd fill that pipe up just like a bale of hay packed in there so tight, or the cow was in there.

So, I took it upon myself to actually dynamite those baffles out, and I didn't win any friends from the design people in Denver by doing that, because you had to deal with this hydraulic jump. The water comes through the pipe, and it will sweep through the stilling basin and turn up and there will be kind of a wake of water. You've seen that, I'm sure.

Storey: Uh-huh. It's boiling back on itself.

Rawlings: Yeah. Boiling. That's called the hydraulic jump. Well, this baffle dissipated that energy rather quickly, and so the stilling basin, the concrete stilling basin where that jump occurs, could be shorter. It would save concrete and steel. So, I took the baffle out and the water went down and jumped below the stilling basin, concrete, and started eroding the dirt and the canal bank out. So, to fix that, I just simply rip-rapped it, put rock in, extended the basin, and it worked like a charm. I didn't have permission to blow those baffles out, but after several midnight problems, it didn't take me long to get them fixed so we didn't have to worry about that.

Storey: Reclamation has–there's a saying it's better to ask forgiveness than to ask permission. (laughter)

Rawlings: Sometimes. (laughter) Sometimes.

Storey: Let's see. I had a question that I was going to ask you about all of this.

Rawlings: Incidentally, part of the work being the manager was to collect money for the water from the farmer.

Storey: Oh, it was?

Water Fee Collection

Rawlings: Now, that was interesting. And our rule was that you pay in advance, or we won't give you the water. [Tape interruption.]

So, the farmer–this is during the development period–the farmer would pay Reclamation so much an acre foot for the water, and my job was to be on the table and tell those guys that, "I can't deliver you water until you come in with the money. And furthermore, your check has to–"

Storey: Clear when you bring it in. (laughter)

Rawlings: Clear. (laughter) If you didn't do that, what would happen, a guy would be strapped for money and he'd want you to deliver the water, and then when he got his crop he'd come in and pay you. And I'm sure he would. But Uncle Sam wouldn't allow that. The lawyers would not allow that; they had to have the money in advance. So that was a very time-consuming ordeal for me to do, to collect the money. I did it and I didn't have any people who were without water that didn't pay for it.

But I can remember one time this one rancher was notorious for

skullduggery, and I knew that I needed to get a check from him and make sure it cleared before I delivered water. But he sent his very charming, young daughter in one day and convinced me that I should take this check for the water but turn it on immediately. And I guess I was maybe overwhelmed by her charm and beauty. I said, okay, I'd do it. And, lo and behold, the check bounced just as high as a basketball. Of course, by that time I had delivered a sizeable amount of water. And I can't remember whether I ever got the money or not. I probably didn't.

Storey: I was going to ask you about ditch riders. Did you have ditch riders?

Rawlings: Oh, sure.

Storey: What did they do for you?

Ditch Riders

Rawlings: Okay. A ditch rider, in this case, we had six ditch riders.

Storey: For how much canal?

Rawlings: Well, we gave each person from 3,000 to 5,000 acres of land to deliver water to, but we didn't really go on a number of miles of canals necessarily, although that played into your determination of how many you needed for a certain-sized project. But we'd give them what we called a beat, a ditch rider beat.

Storey: B-E-A-T? Like a cop's beat.

Rawlings: Huh?

Storey: Like a cop's, a policeman's beat?

Rawlings: Yeah.

Storey: Okay.

Rawlings: And that person would be responsible to deliver water to so many farmers, so many turnouts. My job was to get the canal full of enough water to make these deliveries that day. So, I would have to anticipate what I thought I would need maybe twenty-four hours in advance. I'd give the orders to increase the pump discharge capacity as we came into this peak season. See, your delivery would be pretty constant for a while, and then everybody wanted to irrigate at the same time, and you'd go up to your peak. Then everybody would cut their hay, and then they wouldn't irrigate for

a while, so your water deliveries would drop off and then you'd hit another peak. So, you were constantly adjusting your discharge from your pumps into your canal. So, I would have to try to outguess the farmer, and I would maybe put a little extra water in, because I knew the peak was coming.

Then the ditch rider, or course, he would keep me informed of his orders that he got during the day. He'd gather them up. The farmer would stick them in a little tin box that we'd have by his turnout, or he'd call in, one or the other. Anyway, he'd gather up all the orders for the next day or two and he'd tell me what they were. In the evening, before I went home at night, I had to know how much I'd have to increase or decrease the canal flow.

This ditch rider then would take the water from the main canal into a main lateral canal, we call it, and then there would be a sublateral off of that and maybe another one off of that, and then the turnouts would be stationed along these canals. That would be the gate through the canal bank onto a field. Each canal turnout was numbered, and the farmer–let's say Farmer Jones–would order two second feet, kilofeet per second, turnout number 48 starting at 8 a.m. on Tuesday the seventeenth, and we'd have the water coming down from the pump in the main canal on the sublateral until we got to that turnout, and the ditch rider would turn that water out into field. He would measure that turnout amount, two second feet. And he had 5,000 acres that he took care of and that was his job. Keep that water in that little beat area, or his district.

And he also had to watch for failures, canal failures. He had to watch for weed problems. He had to watch for a person who was getting too much water, more than they ordered or less than they ordered. He had to be an ambassador for our project and deal with the farmer, make sure that he did his job so that the farmer got the water at the right time so they could raise a decent crop and would pay their bill. So, it was a very, very important job.

The word "ditch rider" name came from years ago the guy used to ride a horse and do that job. Well, when I was there, of course, they all they had pickups, but we still called them ditch riders.

Storey: And they were Reclamation employees?

Rawlings: That's right.

Storey: Were they permanent employees?

Rawlings: Yes.

Storey: Year-round?

Rawlings: Yes.

Storey: What did they do when we weren't delivering water?

Rawlings: Well, they then became the O&M crew, the maintenance people. During the summer, I would hire a temporary crew of people, and they would be laid off at the end of the irrigation season, but the ditch riders and some of the other people, the heavy-equipment operators, they would stay on permanently. So, I had a core of permanent people, and then during the irrigation season I'd have three or four college kids, for example, that I would hire to do weed spraying or whatever needed to be done, and they'd go back to school or go off someplace else. The core people stayed year-round.

Storey: If I'm doing my math correctly, then on the Helena Project there would be about 30,000 acres irrigated?

Rawlings: No, that was about 20,000, and the one at Toston, Crow Creek Project. was about 5,000.

Storey: Okay. So, the six ditch riders were for both projects.

Rawlings: Uh-huh.

Storey: Okay. Interesting. Well, we are at the end of our two hours. I'd like to ask you now if you're willing for the tapes and transcripts from this oral history interview to be seen and used by people from inside Reclamation and from outside Reclamation.

Rawlings: Yes, I have no problem with that.

Storey: Thank you.

END SIDE B, TAPE 2. NOVEMBER 16, 1994.
BEGIN SIDE A, TAPE 1. MARCH 6, 1995.

Storey: This is Brit Alan Storey, Senior Historian of the Bureau of Reclamation, interviewing Jim Rawlings at his home in Billings, Montana, on March 6, 1995, at about ten o'clock in the morning. This is tape one.

Mr. Rawlings, last time we had talked about your being originally at Great Falls and then going to the Helena Project. I was wondering if you had thought of

anything else you'd like to talk about from those phases of your career before we move on.

Rawlings: Well, thank you, Brit. I think I should talk about a couple of situations that were there at the time that I was sent to Helena, one being the subsurface drainage problem that existed in the Helena Valley unit area, and the other one was the pumping plant that's used to pump water from the Missouri River to the Helena Valley Project. I'll start first with the drainage problem.

Subsurface Drainage

When we built the Helena Valley unit, it's about a 15,000-acre project and it encompassed most of what we called the Helena Valley, farmed land. That would be land that would be north of Helena. At one time, relatively the same area was irrigated by the Montana Power Company. They had put in a pump and a canal system, and they pumped water from Helena Valley Lake, it's called, which is actually a backwater of the Missouri River created by the Hauser Dam, which is a Montana Power dam just below Canyon Ferry Dam, which is a Reclamation dam, part of the Missouri main stem.

Over the years and irrigating with this Montana Power system, they waterlogged about 5,000 acres of good irrigation ground. By waterlogged, I mean they put the irrigation water on the soil, and it eventually built the groundwater table up to where the water was on the surface of the ground. And when this happens, of course, you don't grow crops any longer, all you have is a swamp, or a bog, which most of us call it.

When we built our system, then one of the objectives was to drain that 5,000-acres of seeped ground and to reclaim it and farm it again. In the process of doing that, some of the ranchers that owned this seeped-out ground had survived, many of the neighbors starved out and had to sell because of the bogged-out ground.

But to make a long story short, several ranchers in the area were able to buy up their neighbors' land even though it was seeped, and they used it for swamp-type pasture, and they raised cattle there and somehow made a living. So, when we came in and built our system and built the drains, subsurface drains, to drain the land, they sued the federal government for damages for over drainage, these big landowners.

Storey: Oh, they did?

Rawlings: When I first got there on the job, we were about to go to court. I may have mentioned this is my earlier time with you, but one rancher by the name of O'Connell [phonetic], he was the biggest landowner that had sued us, and sued the government for $250,000. Well, back in 1960-61, that was big money.

Part of my job was to gather data for the trial and attempt to win for the side of the government. To make a long story short, all the testimony was given and all the data that was gathered by the Bureau engineers and soil scientists and drainage people and we were able to win that lawsuit, and the landowner did not receive any damages. In other words, we had done what we had promised we were going to do–we, the government. I think the biggest complaint of the landowner was the fact that he had to break up a rather large ranch and only irrigate 160 acres, as you recall.

In those days, the limit that one person could irrigate was 160 acres. Right now it's 960, but that's been changed because of the economic conditions. Over time, the government did realize they had to change it from 160 to 960.

Then there were other landowners that also sued the government, and we, in turn, were able to demonstrate that we had done the proper thing to do what we said we were going to do in the definite plan report. And as a consequence, we did not have to pay any damages at all, which I thought spoke well for the Bureau experts there, who did a good job of putting the case together and demonstrating that what we had done was right and Congress had authorized that type of drainage work.

I need to tell you that since our drainage systems did go in and work so well, that the land is now reclaimed and producing exceptionally well, whereas before, it was just swamp ground, and the production was very minimal. It did provide a few ranchers with some swamp grass pasture, but production was not what it is today. So that's one success story that I like to tell, about my earlier days with Reclamation.

Helena Valley Pumping Plant

Another problem that I ran into–and I think it's kind of an interesting one–the Helena Valley Unit is irrigated by a pumping plant that pumps water from the Missouri River, lifts it about 172 feet into a tunnel, a three-and-a-half-mile tunnel, that goes through the mountain and then comes into a canal and winds its way around the Helena Valley Unit, almost makes a 360-degree circuit around these 15,000 acres of land.[15]

[15] Helena Valley Pumping Plant, 500 feet downstream from Canyon Ferry Dam, houses two 5,000-horsepower Francis type hydraulic turbines; each turbine is connected directly to a 150-cubic-foot-per-second centrifugal pump;

The unusual thing about the pumping plant is that it's a hydraulic turbine-driven pump as opposed to an electric motor-driven pump. Now, hydraulic turbine, of course, is the same kind of equipment that you run a generator with to generate electricity. Its falling water driving a wheel and turns a shaft and either generates electricity with a generator or pumps water with a pump. This is a pumping plant that's rather unusual. I only know about two or three such plants in Reclamation, two of which happen to be in my region. No, actually three, I take that back; there's one at Huntley [Project][16] and there's one at the Lower Yellowstone Project,[17] all three in Montana, and then the one in Helena.

Well, after about two years of operation of that, there were two pumping units. My superiors at Great Falls told me that they wanted me to dismantle that unit, one of the units, and check the tolerances on the bearings and the shafts and so forth and make sure that it was operating properly and would last for many years. They thought it would be good if I would dismantle a unit and check this all out, and then put it back together during the wintertime when we weren't pumping. I said, "Fine. I think we can get that done."

I began to look for what we call "as-built" drawings at the pumping plant to tell me how to dismantle this turbine and pump. And lo and behold, there were very few drawings. In fact, there was just one general drawing that kind of showed the layout of how the pump and the turbine were hooked together.

It was very cold in that area. It was an outdoor-type pumping plant where the crane that lift the equipment out of the chamber that held the shaft and the pump

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the two pumps lift a total of 300 cubic feet per second of water to the inlet end of the Helena Valley Tunnel. Water is supplied to the pumping plant by a 10-foot diameter welded steel penstock pipe from Canyon Ferry Dam. A portion of the water from the reservoir is pumped up to the tunnel through a 75-inch-diameter discharge line; the remainder is discharged into the Missouri River. A 10-foot-long reducer section at the upstream end connects the penstock pipe to the 13-foot diameter conduit liner pipe in Canyon Ferry Dam. A 60-ton fixed-wheel gate in the upstream face of Canyon Ferry Dam regulates the flow of water into the penstock. An exposed manifold provides for future installation of a small powerplant. A 92-inch butterfly valve is located in each of the two branches for the turbines.

[16] The Huntley Project is in south-central Montana. Project works include a rockfill and concrete diversion dam, 32 miles of main canal, 22 miles of carriage canals, 202 miles of laterals, 186.5 miles of drains, a hydraulic turbine-driven pumping plant and an auxiliary electric pumping plant, both in the main canal, and in an off-stream storage reservoir. The project can furnish water to irrigate approximately 30,000 acres. For more information see, Timothy A. Dick, "The Huntley Project," (Denver: Bureau of Reclamation History Program, 1996, https://www.usbr.gov/projects/pdf.php?id=126.

[17] The Lower Yellowstone Project in east-central Montana and western North Dakota includes the Lower Yellowstone Diversion Dam, Thomas Point Pumping Plant, the Main Canal, 225 miles of laterals, and 118 miles of drains. The purpose of the project is to furnish a dependable supply of irrigation water for approximately 58,000 acres of fertile land along the west bank of the Yellowstone River. About one-third of the project lands are in North Dakota and two-thirds in Montana. For more information see, Timothy A. Dick, "Lower Yellowstone Project," (Denver: Bureau of Reclamation History Program, 1993, https://www.usbr.gov/projects/pdf.php?id=131.

and the turbine together was an outside building, and in the wintertime in that cold canyon, below Canyon Ferry Dam, it was very difficult to work because you had to work outside. You had to pull all of this heavy equipment out of the hole and then check it and then put it back together.

So, I called for help, and lo and behold, we couldn't find any drawings in Great Falls, Billings, or Denver. It was really an oversight of the people who constructed the plant in the first place. They should have made certain that the contractor and the designer left proper drawings for the thing to be maintained properly, but unfortunately that didn't happen.

We contacted the Leffel Company, which is a company that designed and built the turbine, and they said they didn't have any drawings available either, but they were glad to send out an expert to help me dismantle that unit and his cost would be $125 a day plus expenses. Well, we all thought that was an outrageous price in those days. They just told Rawlings to go ahead and do it anyway.

To make a long story short, myself and my team people, we had about ten on the crew, we dismantled that unit that winter and checked all the bearings and the sleeves on the shafts, and did find some wear and had that repaired, put it all back together, and reassembled it in time for pumping season the next spring. So that was a real experience for a young engineer out of school for only two years, I thought. And it has been one of the funnest jobs I've ever had, really, being manager down there.

But I wanted to tell that story so that someday, hopefully, if they ever build another plant like that, the construction engineer has the wherewithal to make sure we've had the proper drawings.

Storey: Absolutely.

Rawlings: I will say that the pumping plant has functioned very well for these last thirty years and done a wonderful job of keeping water in the canal, at a low cost.

Storey: Does that mean we have to have a diversion dam there or something?

Rawlings: Well, the diversion dam is the Canyon Ferry Dam, which is a high concrete dam that was already built, and we put our pumping plant down below the big dam and used that falling water to run our turbine. About half the water that came through the dam, the base of the dam into the turbine, would drive the turbine and fall back in the river, and the other half would go up the mountain into the canal. And rather than run an electric motor to do that pumping, we just simply used the water power

to drive the turbine to pump the water.

Storey: Do we also generate electricity there?

Rawlings: Yes. There's also a powerplant at the dam, and that is a separate building and a separate function.

Storey: Do you happen to remember how much water goes through the power plant, as opposed to the pumping plant?

Rawlings: Offhand, I don't remember the volume, but it's considerably more goes through the powerplant than in the pumping plant, probably ten times more.

Storey: If I'm remembering correctly, when you went to the Helena Project in the early sixties, it was a new project at that time.

Rawlings: Yeah, we had just finished.

Storey: Had the pumping plant then been added at that time?

Rawlings: Well, yes, it was part of the Helena Valley Unit which we had to have a pump in order to irrigate any land. So that was constructed the same time the canal system and the drainage system was constructed.

Storey: So, you dismantled this and looked at it just a few years after it was put in.

Rawlings: About two years after.

Storey: Okay. Does that mean it requires a cyclic maintenance of every couple of years, or do you happen to know?

Rawlings: No, that was one of the things that we were trying to prove to ourselves, how often we would actually have to take that thing apart and repair it. And as a result of the findings that we made, I don't think they dismantled the unit since then, unless it's been done that I wasn't aware of.

The other units were dismantled the next year, and there was some unusual wear on the shaft sleeve, that's the big shaft that hooks the turbine and the pump together. Has a bronze sleeve on it, and when that shaft turns, that bronze sleeve wears instead of the shaft wearing, and we resolved that wear problem when we took it apart. We changed the metal on the shaft sleeve from bronze to stainless steel, and it wore much better than the bronze because it was much harder.

Then also there was some sand that was coming into the turbine and lodging in the packing material that is around this sleeve I've been telling you about. When the shaft would turn, that would wear the sleeve. We resolved that problem as well. To a certain extent I'm sure there's still some wear there. Every so often that sleeve has to be replaced or rebuilt.

Storey: So, there are two pumping units there? And you only did one the first year.

Rawlings: That's right.

Storey: Did you do drawings or instructions or something for people on how to deal with the–

Rawlings: Well, I kept a log of our activities, and that was left there on the job, and I assume it was made available to the people that dismantled the next unit. I wasn't involved in dismantling the second unit. By that time, I had gone back to Great Falls in a new capacity. But the team of people that worked with me, Bob Green and Burt Manson were the principal people. They stayed on and took the other unit down the next year.

Storey: Tell me about your change to Great Falls.

Toston Pumping Unit

Rawlings: Well, after being in the Helena Valley job–incidentally, the Toston Pumping [Plant] that I mentioned was also under my responsibility while I was at Helena, and that's a small 5,000-acre unit down in Toston, Montana, which is about sixty miles south of Helena, toward Bozeman. I shuttled back and forth and actually operated both of those projects. They were both relatively new Bureau irrigation projects. And under my management, I had both of those, and that was a similar-type unit, only they were electric motor-driven pumps. They pumped water from the Missouri River out of the canyon into a canal and irrigated 5,000 acres. That's kind of an unusual unit there. Maybe I'll tell you about it briefly.

Storey: Yes, please.

Rawlings: That unit was ordered to be constructed by the Congress, at the request of the county commissioners of Broadwater County in Montana. When we built Canyon Ferry Dam, we inundated lots of so-called prime river-bottom agricultural land, and in Broadwater County that totaled to about 5,000 acres. The commissioners of the county said they would support building Canyon Ferry Dam if the government would replace those 5,000 irrigated acres in the county someplace.

So, when the Canyon Ferry Dam was constructed and closed–that is, ready to store water–I think they closed in 1953, when the reservoir filled up, the ag land that they were concerned about that would come off the tax rolls were inundated. So, the Bureau of Reclamation was given the task to go out to Broadwater County and put in this 5,000-acre project to replace those lands that were inundated. So, we found a place to build a pumping plant and found the land that could be irrigated, and we set in motion to build this project.

Ironically, we did not have a contract with the farmers who were going to receive the water. Ordinarily, the Bureau process is to go out and find a potential project, get the local interests involved, interested enough to sign a repayment contract to pay for the project, and then go ahead and build the project.

Well, in the case of the Toston Pump Unit, because Congress said, "You shall replace those 5,000 acres of land," we did not do that. We just went out and started building the plant and built the canal, condemned the right-of-way and said to the landowners, "Here it is. Now you've got to pay for it." Well, some of those landowners were rather large dry-land wheat farmers, and they didn't want to break up their wheat farms and be a small-time irrigation farmer. So, there were lots of bitter feelings about that.

My job as the manager was to go down and to meet with the irrigation district board and try to encourage them to sign a repayment contract for this water. As I recall, out of the 5,000 acres, we had about 1,200 signed up when I first got on the job. Before I left, we were able to encourage the people to sign up, and I think we had almost 5,000 signed up when I left the job site and had a contract in hand to pay for the water they were going to get.

The big landowners reluctantly sold out and left, and the different type of a farmer came in and took their place, that is the irrigation farmer versus a dry-land farmer. So, there were some bitter feelings among the existing landowners there that I had to deal with. Many nights I'd spend hours at these meetings with these people and take a lot of abuse, verbal abuse, believe me, from these people.

I didn't do that entirely by myself. Occasionally people from Great Falls would come and help with the meetings, or from Billings. But basically, I was the driving force to encourage people to sign the contract and get on with life.

I will say that that's one of the most successful little projects that I think Reclamation's ever built. That the land was good, the drainage was good, and people that are there now are making a good living. Of course, over time we were able to go from 160-acre limit to the 960 limit and that was a real help to a lot of

farmers on Reclamation projects.

Storey: You've mentioned the success of both the Helena Unit and the Toston unit, was it?

Rawlings: It was called the Crow Creek Pump Unit[18] at Toston, Montana. They're both units of the Pick-Sloan Missouri Basin System.

Storey: What do they grow there?

Rawlings: Well, basically the same on both projects. Early on, they were raising sugar beets. Then the sugar companies closed the beet factories, and so the sugar beets went out of the picture. But they raised malt and barley and alfalfa and some small grain for feed. Over the years, the hybrid corn has come into the picture in Montana, and a lot of those farmers now raise corn for silage to feed cattle in the feed lots.

Storey: So, it's largely a cattle or livestock feeding operation?

Rawlings: That's right. Usually what happened, a lot of the farmers would buy a unit on our project for a feed base. They'd grow their feed, and they may have a homestead there on the project, but they would also have dry land elsewhere, and they would summer their cattle in the mountains and winter them on the project, grow the feed and feed their cattle that way. One kind of complemented the other.

Reclamation as a Social Program

The Reclamation projects stabilized the livestock industry in the West by having water available each year for feed production. If you didn't have the water available, then you would hit and miss. One year you might have a good crop on dry land, a reasonable good crop for hay for feed for your cattle, but the next ten years you might not have any to speak of, and so you'd either go broke or you'd have to buy your feed from somebody else, which was very expensive. But by having an irrigation project in place, storage like Canyon Ferry Reservoir, and even in the drought period, we have water for those lands, and it really stabilized the entire economy of the area and the state itself, the states where we are.

We did what we set out to do, and that was a social program, to develop the arid West. And when we came out and built our projects, first irrigation and then power and then recreation, it all came together. It's really a neat experience, and something that if we didn't have Reclamation over the last ninety years, the whole

[18] The Crow Creek Pumping Plant is on the left bank of the Missouri River about 6 miles upstream from Toston, Montana. The plant contains three units. Each 33.3-cubic-foot-per-second pump is driven by a 900-horsepower synchronous motor operating against a total dynamic head of 180 feet.

country would not be where it is today, in my opinion.

Look at California in the Central Valley out there, for example. I've forgotten what percentage of the fruits and nuts that are on the table for the public, the American public, come from those projects, but it's an astronomical amount percentage wise. And also, as a consumer, we have beef to eat, and pork, poultry and fruits and nuts and vegetables because of Reclamation [unclear].

Had those projects been developed with private money, which I doubt would have happened, because the private companies couldn't afford it. But if they were able to do it, the price of food would be much higher than it is today. And that's one thing that the Congress and many people forget about. They criticize the government for subsidizing water to these farmers, but if they would just stop and look at the big picture, they'd realize that its subsidizing all of us and not just the farmer, because you have cheaper food to buy. In that respect, I think Reclamation can kind of stand tall and take credit for that.

Solving Drainage Problems

Then after Helena, I went to Great Falls again. I was beckoned by my superiors in Great Falls to come back to the Great Falls Projects Office–in those days that's what we called it–and assume the project area drainages supervisory position. That position was one that would be responsible to investigate existing irrigated lands that needed drainage and determine where to put the drains and how to build them and how much it would cost to do that and who would pay for it, and also to investigate new lands that we were attempting to irrigate.

We had many, many units and projects in the Upper Missouri Region. That's what we called it at that time. That region consisted of Montana and Wyoming east of the Continental Divide and parts of North and South Dakota. That was the Missouri Region.

But at any rate, we were looking at a lot of units in the Great Falls project area for future development, and I had a crew of people that went out to do test borings to analyze the soils from those borings and determine what drainage would be necessary if we could build a project on these certain lands. You'd come up with a cost per acre for drainage. By doing that, we would have drainage and the total project cost, whereas in the early days, I think a private entity and Reclamation would build an irrigation project, and their concern was to get the water from the water source to the land, but they overlooked drainage. When they did that, usually the groundwater table would come up and you'd start to seep out these farmers, and they'd go broke, and you'd have to go back and build the drainage that you hadn't

planned early on.

So, over the years, Reclamation learned through experience to make sure they were including the draining process in the cost of the project and get that authorized by Congress from the beginning. Then as the drains were needed, after irrigation started, we would have the money to do that.

A good example of that problem is the Columbia Basin Project in Washington State, where Reclamation built a half-a-million-acre project there, and in the early deliberations, the drainage people said, "Well, let's set aside $12 an acre for drainage." The groundwater table was 1,500 feet below the ground surface, the area was underlined by volcanic rock, a lot of it was fractured and had a lot of porous space and held a lot of water. Okay?

Everybody said, "Well, we'll irrigate up here 1,500 feet above the water table and we'll never have a drainage problem." Well, lo and behold, in five or ten years, the water table had come up 1,500 feet in this volcanic rock and started to show on the surface, and the farmers were going broke because they were seeped out. So, then the problem was, well, who's going to pay for this drainage that's needed? The farmers had not signed a contract that said they would pay for the drains.

Ironically, my father, William E. Rawlings, W-E Rawlings, had been transferred from the Billings office in 1960 to be the project manager in Ephrata, Washington, of the Columbia Basin Project. His job was to convince the farmers that they must sign the–

END SIDE A, TAPE 1. MARCH 6, 1995.
BEGIN SIDE B, TAPE 1. MARCH 6, 1995.

Storey: You were saying that your father had transferred up to Ephrata on the Columbia Basin Project and was having to deal with drainage problems there.

Rawlings: Yes, he was made the project manager there, and I won't get into the details of that story, but it's one that needs to be told, and it if hasn't been told to you, it should be.

Storey: Please tell me.

Rawlings: Well, like I say, that project was a big one, and nobody thought there would be draining problems, subsurface drainage problems, but lo and behold, it did happen. And to make a long story short, my father was able to negotiate repayment contracts with the farmers on that project to go ahead and build this drain system that was

needed in order to continue to irrigate there.

I've heard some wild stories about threats that were made to the Reclamation people by the farmers. They were not going to pay for the construction of the drains because they already had a contract in hand that said it's for repayment of the canal system and they were entitled to so much water a year from the government. So bitter, bitter feelings there.

And to make a long story short, my father was able to resolve that bitter problem and get contracts signed up and then go ahead and hire drainage people to install the drains. As a result of that, he was there from '60 to 1970, when he retired. By the time he retired, the drain construction was well under way and the problem was being solved.

I wanted to tell you that story to emphasize that subsurface drainage is just as important on an irrigation project as putting the water on the surface. If you don't have both, you aren't going to have a successful project. So, my job at Great Falls was to attempt to estimate what drainage would be needed if, in fact, we irrigated a certain piece of land. And we would have to go out and drill test borings and check the permeability of the soil, and from all of that data that we gathered, we would estimate the miles of drains that would have to be installed if we irrigated a particular piece of ground.

Let's say the project that we were studying had a potential of 50,000 acres of irrigated ground. Well, my job was to come up with a cost per acre for drainage, similar to what you might estimate the cost per acre for canals and laterals, and storage facilities. This all makes up the total estimated cost to build the project. Then once you get the total cost to build the project, then you make a determination of the ability of the farmer to pay. His or her part is to pay for the operation and maintenance cost, plus their ability to pay a portion of the construction cost. Those two complements make up his payment per acre that he has to pay each year for water. Then what the farmer can't afford to pay, the power revenue from the Missouri [River] basin system pays the difference for the construction of that project.

That's the purpose of the Pick-Sloan Missouri Basin Program.[19] It was a multi-function project where the power revenue subsidized the irrigation and also

[19] The Pick-Sloan Missouri Basin Program, formerly called the Missouri River Basin Project, was initially authorized by the Flood Control Act of December 22, 1944, which approved the general comprehensive plan for the conservation, control, and use of water resources in the entire Missouri River Basin. For more information see, Toni Rae Linenberger, "Overview: Pick-Sloan Missouri Basin Program," (Denver: Bureau of Reclamation History Program, 1998, https://www.usbr.gov/history/ProjectHistories/PSMBP%20OVERVIEW.pdf.

subsidized the flood control and the recreation and fish and wildlife as well. It was a neat, neat program, I think, a very well-thought-out program and very successful.

Storey: Well, I'm aware, for instance, of the drainage issues on the Milk River Project. No, excuse me, on the Belle Fourche Project[20] where they came in, they didn't plan for drains, and at first there were just a few acres, then a few hundred acres, and they had a terrible time getting the farmers to agree to pay, because only a few farmers were being affected at the time, and as it spread, they finally got a drainage program set up on the Belle Fourche Project.

Tell me what kind of backlog of drainage needs you came into when you went to the Great Falls Project Office then. Or did you? Was everything caught up?

Drainage Needs Throughout the Region

Rawlings: No, it seems that there's never enough money and time to get ahead of the drainage requirement. Helena Valley was a good example. We had to build those drains. A few drains were needed at the Crow Creek Pump Unit area, and we got those in.

We were, at the same time, building the East Bench Unit down in Dillon, Montana, and drainage requirement was included in the cost there, and we anticipated that we would need drainage there. But as a result of the sprinkler irrigation that came in later, not so much water was put on the ground, so the drainage requirement was much less than we anticipated in that project.

On the Milk River Project in Montana, we had drainage problems. That's a little unusual up there in that a lot of the land that we irrigated on that project are heavy clay soils. Today we would not build a project on that heavy a soil. But when that project went in, in the early 1900s, we didn't know any better. So, there were a lot of drains on that project that needed to be constructed, and also the maintenance on the existing drains was poorly done and that had to be rehabilitated.

Like you mentioned the Belle Fourche Project, we had some backlog of work to do there. Later on in my career, I was involved in the rehabilitation and betterment program for the Belle Fourche Project, and we did some rehabilitation on their draining system at that time. Maybe I'll tell you about that later.

[20] Belle Fourche Project is located in western South Dakota northeast of the Black Hills. Principal structures include a diversion dam, a storage dam, and a system of canals, laterals, and drains to irrigate 57,068 acres in the general area of Newell, Vale, and Nisland, South Dakota, along the valley of the Belle Fourche River. For more information see, Christopher J. McCune, "Belle Fourche Project," (Denver: Bureau of Reclamation History Program, 2012, https://www.usbr.gov/projects/pdf.php?id=214.

The Lower Yellowstone Project and the Huntley Project in Montana had a little bit of backlog on their drainage construction requirements. But all in all, I think those two projects were in pretty good shape outside of some localized areas that were seeped out and also some drains that needed to be rehabilitated and rebuilt.

The biggest part of my job in Great Falls was to investigate the new land that we were looking at. We were looking at probably twenty different units of the Pick-Sloan that had potential for development. Unfortunately, we didn't build any of those, including the Garrison Unit over in North Dakota. You may know with a story on that one. That was another half-million-acre project that we had under construction. And because of some political and local problems, the project has essentially been put on hold, even though we've got a big canal halfway across the state just sitting there not being used, and a big pumping plant to pump the water into the canal.

Storey: What kind of crew did you have for studying these problems?

Personnel Required to Study Drainage

Rawlings: Well, we would have myself and a couple of other engineers and then a drill crew of four or five people, and then we worked with the soil scientists who were in a separate branch in the Great Falls office. Soil scientists were responsible to look at the top five feet of the soil in a potential project area and determine whether or not that was suitable for agriculture production and irrigation. Then the drainage engineers' responsibility was to look at the ten-foot profile and tell the powers-that-be that the land was drainable at a reasonable cost.

The reason we went to ten feet, that's about the maximum depth that you put a buried pipe drain or to dig an open drain. If you get much deeper than that, it's just uneconomic to put those in. So, we had to check the permeability of the soil really from the surface down at least ten feet and beyond and find what we call barriers below that point. A barrier might be a layer of clay, say fifty feet below the ground surface. When you artificially apply rainwater–that's what you're doing when you're irrigating–some of the water is used by the crop. Let's say you put three feet of water on the soil. The crop, as a general rule, will use about two feet of water to evapotranspiration. That means that the plant takes that much water and consumes it in its production, in its life production.

The rest of that water that you put on has to go someplace. As a general rule, it goes on down through the soil profile for the groundwater table below. The groundwater table might be at 2,000 feet below you and it might be ten feet. That's

what the drainage engineer's job is to do, is to determine where that groundwater table is and to keep the ground water out of the root zone. The root zone is the top four feet. His job or her job is to determine where the groundwater table is when you begin irrigation and how long it will take to get up to four feet, and how many drains it will take to keep the water below the four-foot level.

It's an art. I think we've got it down. Reclamation over the years has got it down to a science, almost. A matter of fact, the Bureau drainage people at least were at one time, were known worldwide for their ability to analyze the drainage problem and design a system that would control the groundwater, keep it out of the root zone.

Some of the great people that did this was Charlie Meierhoffer [phonetic] in Denver. You may know him. If you don't know him, you should talk to him. He still lives there. Charlie Meierhoffer.

Storey: M-E-Y-E-R?

Rawlings: No, it's spelled different than that. That may be close. I think you can find out. Ray Winger [phonetic] is another one, he's in Denver. And Lee Dumm, I don't know if Lee's still alive or not.

Storey: D-U-M-M?

Rawlings: D-U-M-M. Meierhoffer's got an "O" in it, H-O-F-F-E-R, I believe, but you're close. I think you can find it in the phone book. Now, if you could talk to Meierhoffer and Ray Winger, you would be talking to probably two of the best drainage people in the world. In fact, I know they are. They were my teachers. I didn't stay in the drainage field for very long, but I certainly learned a lot from those two men while I was in it.

So, 90 percent of my work was to investigate new lands and come up with a cost per acre for the drains. I did design and install some of the drains at Helena Valley after I went back to Great Falls, and that was an interesting part of my work, was to be able to say, "Okay, this is where we need the drain and this is how we're going to build it and this is how big a pipe we're going to put in," and then actually do it, see if it worked. And they did work.

Storey: Did you do open drains also?

Types of Drains

Rawlings: Well, the open drain is usually used for an outlet of many miles of closed pipe drains. We say closed because we cover them up. It's an open pipe actually with perforations in it, and it's covered over the top with dirt, and you can farm over the top of what we call a closed drain. Those then are brought around where they outlined into an open drain where the capacity is much bigger and gets the water back to the river system. These open drains also take a lot of surface water on them so you have to build them so they have a capacity to fluctuate over a year's time, and their discharge would be maybe ten second-feet one day and the next day it might be fifty second-feet in there because of a rainstorm or snowstorm or both, plus your drain water that you're putting in there.

Storey: How do you keep them from plugging up?

Rawlings: Well, that's a great question. We had the weed problems at Helena that I told you about. A windstorm would come up and blow the tumbleweed and actually fill that open drain completely up with weeds.

Storey: What about the closed drains, though?

Rawlings: The closed drains, they're mostly concrete or clay pipe, and then around the pipe we put what we called a gravel envelope, and that would filter the water coming into that pipe and keep all of the foreign material out that would tend to plug up the pipe. So, there's really no trash coming into that pipe. If you did get one plugged up with a tree root, something like that, then you'd have to use some kind of a rotor rooter or an air jet, water jet, to clean the roots out of the pipe and flush it out. And if you couldn't unplug it that way, then you'd dig it up and fix it.

Storey: But I gather from what you're saying you didn't have to dig up a lot of closed drains to repair them.

Rawlings: No. No, we didn't. We were careful about asking the farmers not to put trees over the top of the drain. We instilled in their mind that that drain was there to keep them from being seeped out by high groundwater, and not to plant trees or shrubs or bushes over the top of them, like in a shelter build or something like that, because if you would do that, those roots would go right to that pipe, grow through the perforations or the joint at the pipe joint, and fill that pipe in a year's time full of roots. That's a special problem that drainage people are confronted with.

Over time–you're familiar with the Rotor Rooter Man?

Storey: Yes.

Rawlings: That's a cutting blade on a table that turns and cuts the roots loose and then you flush them out. Well, we've got a better deal than that. Now they've got a high-pressure water jet system that does the same thing, only you push this high-pressure water pipe up into the drain–it's a hose–and it's got such high pressure that the water pressure will cut the roots and wash it out, and you can clean a drain much easier and cheaper with that.

Storey: I would think these drains would be quite long sometimes.

Rawlings: Oh, they're miles long. Yes, you have openings every so often. A manhole.

Storey: Oh, you have access.

Rawlings: Yes, where you can get to them. By having that access you can, number one, determine how much water is flowing in the pipe. You can check to see if all your calculations were reasonably accurate for flow rate capacity in the pipe. You can also determine whether there's any plugging problems upstream or downstream from where you're at. And then if you do have a plug, say tree roots, upstream from the manhole, you could get your water jet equipment in that manhole and run it up to the plug and take it out.

Storey: The manhole system, who was checking that? Reclamation or the farmer?

Rawlings: Well, the Reclamation, when you'd build a project back in those days, we'd have what we called a development period. For ten years the Reclamation people–actually, the crew that I was with managed at Helena and Crow Creek, we were Bureau employees. We had ditch riders and maintenance people and operations people that delivered the water to the farmers, and in the process of doing that, the ditch riders would watch and do daily maintenance, pull weeds out of the canal or check to make sure that the drains were operating properly, and all of this was done by a Reclamation force.

Then at the end of the development period, we would turn that job over to the irrigation district. During that development period, the irrigation district people would become familiar with how the project is operated, learn how to do all this. At that time, they'd hire their own people and do it from then on. Sometimes the Bureau people would simply change from being a federal employee to an irrigation district employee and stay right on the job. Rather than being relocated, they preferred to do that. It worked out good for both.

Storey: Do you remember any of the drainage projects that you had while you were the Chief of Drainage for them in Great Falls?

Drainage Projects

Rawlings: Well, one of the big ones was the investigation of the Jefferson Whitehall unit. My memory's not going to tell me how many total acres that involved, but it had to be somewhere in the range of 150,000 to 200,000 acres. We were building a canal system from the Big Hole River in Montana, near Three Forks–near Dillon, actually–and building a reservoir in the Big Hole River called Reickley [phonetic] and letting water from Reickley Dam and reservoir into the Jefferson River, and building a diversion dam at Twin Bridges, Montana, and pushing the water into the canal and bringing it all the way over almost to Canyon Ferry Dam on the east side. And in route, we were going to irrigate all of acres–my memory tells me somewhere in the range of 200,000–and those are the lands that I investigated for drainage requirements.

Incidentally, that project was not constructed. Local people became disinterested, and that was about the time that the environmental movement started to come into play. The Big Hole River is a famous wild trout stream in Montana, and the fishing guides did not want to see that river dammed, because the reservoir would take up a few miles of the prime blue-ribbon trout water.

So, to make a long story short, because of lack of local interest and the opposition from the environmental groups, we did not build that project.

Storey: So, the dam was not constructed–Reickley, I believe you said.

Rawlings: Reickley was not constructed.

Storey: Okay. And the canals were not constructed?

Rawlings: No, diversion dam was not construction and so on. That project, along with probably twenty or thirty others, the reports are on the shelf in the Bureau offices that are ready to go. In other words, if there was a crisis, a world crisis, and we needed to irrigate that land, technically all we'd have to do is take those reports off the shelf, upgrade the cost estimates and probably size them some, but they would be ready to use.

I think that's good. A lot of people don't know about that, but there's a lot of projects on the shelf that are ready to go if we need them, and we will. We will need them someday. You think that the world population's going to go–the World Bank says 5.2 billion now. By the year 2030, it'll be 8.5 billion. How are we going to feed all those people?

Storey: A lot of people.

Rawlings: So, my theory is that the plateau that Reclamation is on right now, not building more projects, more dams, and so forth, is simply that, and it will eventually turn and go fully back in business probably not in my lifetime, but later on we'll have to do that. We'll just have to.

Storey: Do you remember any incidents with drainage that are sort of interesting while you were there at Great Falls, or unusual situations, anything like that?

Tiber Dam

Rawlings: Yes, one of the units that I was involved with was called the–the name of that eventually will come to me. Tiber Dam is a dam that's existing in Montana, and it was the land that was to be irrigated from Tiber Dam.[21] Tiber's on the Marias River, which is a tributary to the Missouri, but it lays south of Missouri and flows into the Missouri in an easterly direction.

That project was kind of an interesting one, one that was authorized when President [Harry S.] Truman was our president. There again, it's kind of an unusual project. Ordinarily we would investigate this project area. We'd say, "Okay, if we build Tiber Dam, then we could irrigate 125,000 acres east of the dam," and we had the farmers out there forming irrigation districts, which was part of the plan.

Then we were in the process of negotiating a repayment contract with those people to pay for the project if we built it, and there was political decisions made, "Well, let's go ahead and build the dam before you get the repayment contract." Personally, I think that maybe Truman wanted a dam built during his watch. And to make a long story short, we built Tiber Dam and that stores over a million acre feet of water.

And in the meantime, in this area that we were looking at, the project area was to irrigate 125,000 acres. The drainage question came up, and Meierhoffer told the people in the Great Falls Office that there needed to be more work done on the drainage cost estimate for that project. He knew that there was some heavy barriers

[21] Constructed in 1956, Tiber Dam is a zoned earthfill structure located on the Marias River, approximately 20 miles southwest of Chester, Montana. The dam has a crest width of 30 feet, a crest length of 4,300 feet, and structural height of 211 feet. Tiber Dam is the primary feature of the Lower Marias Unit of the Pick-Sloan Missouri Basin Program is in north-central Montana along the Marias River. The unit has an adequate supply of irrigation water to irrigate 127,000 acres of land and also will control floods to make possible the multiple purpose use of Fort Peck Reservoir. For more information see, Scott Walker, "Lower Marias Unit: Pick-Sloan Missouri Basin Program," (Denver: Bureau of Reclamation History Program), https://www.usbr.gov/projects/pdf.php?id=170.

not far below the surface of the ground. It's a material called till, which is just finely ground material from glaciation, very fine, it's clay-sized particles and water doesn't penetrate it very well.

The early investigation of that land, the engineers at the Great Falls Office said, "Well, we can irrigate 125,000 acres." "Well," they said, "Rawlings, we want you to go out and check that and make sure that the cost estimate is accurate and can you really truly drain those lands for that kind of money." So, myself and my crew went out there, and to make a long story short, based on the knowledge that we had that the engineers didn't have before us, we boiled that 125,000 acres down to about 35,000. And in the meantime, the farmers out there were big dry-land wheat farmers, and they didn't want to break the farms up anyway. So, they disbanded their irrigation district and told the government to go away, they didn't want irrigation. But there was this big controversy over whether or not you could irrigate and drain this till land.

So that was a big uproar there, really in-fighting in the Bureau, between the drainage people and the planning people who wanted to build this big project, and the drainage guys came along and said, "You can build it, but it's going to cost you a lot for your drains that you don't have in your cost estimate. If you put the total cost for drainage that we tell you you've got to have in your process, the benefit-cost ratio will go to pieces on you. You've got to have benefit-cost ratio of at least one." So, there was that big argument there about irrigating this till land.

Ironically, many years later I was the Regional Water, Land, and Power Supervisor in Billings. I was responsible for the entire drainage program for the whole region. This same question came up in South Dakota. At that time, we were investigating the Oahe Unit, and then later a Mid-Dakota Unit, was one called Syndak [phonetic], and the big controversy over irrigating this till land without the proper amount of drainage came up, and I was right in the middle of that fight.

To make a long story short, I think I was right in telling the planners and the constituency that they needed more drain money in their cost estimate. And to make a long story short, the project was not built, but there was a real argument over whether or not the drainage estimates that I was responsible for were proper or not. That's another story. But from a professional standpoint, I felt like that was my job to tell my boss how much I thought the drains would cost.

Of course, the planning people and the constituents wanted to go ahead and build the project without worrying about the drains, and then build them later if they needed them. Well, then you'd have another Columbia Basin situation, exactly, and you'd have to go to the farmer and get them to sign to pay for the drains and then go

to Congress and get the money, and we were trying to avoid that, and we did. But unfortunately, the project was never built.

Storey: Though the storage was there.

Rawlings: Oh, we got the storage in the main stem reservoirs over the Missouri. The Oahe Reservoir is there and Garrison.

Storey: And Tiber, didn't you say? Am I confusing things?

Rawlings: Well, getting you back to Tiber now, that's a dam and reservoir in the Missouri Basin, but it's not on the main stem. It's on a tributary called the Marias River.

But at any rate, so we built Tiber Dam and there that beautiful reservoir, dam and reservoir sitting there, has not really been used for much except recreation since it was constructed in the early fifties. The farmers didn't want the irrigation. They abandoned the irrigation district, and so the government just has that reservoir sitting there. Over the years, I marketed about enough water out of that to irrigate about 3,500 acres. The local farmers were pumping out of it. Then we'd market some municipal water out of there, and then flood control. It's been a beautiful–

END SIDE B, TAPE 1. MARCH 6, 1995.
BEGIN SIDE A, TAPE 2. MARCH 6, 1995.

Storey: This is tape two of an interview by Brit Storey with Jim Rawlings on March 6, 1999. You were saying that Tiber Dam has been a very good flood control reservoir.

Rawlings: Yes. In the 1964 floods that we had up in this neck of the woods, two dams above Tiber failed as a result of heavy, heavy rainfall or snow cover. One was the Lower Two Medicine Dam, which is a B-I-A [Bureau of Indian Affairs] dam on the Black Feet Reservation, and the other one was a privately owned dam on the Swift Creek near Dupuyer, Montana. As a result of much rain above those two systems, filled the reservoir, overtopped the dams, and they washed out.

Those two dams and their drainages came into the Marias River above our dam, literally drank all the water from those two failures in reservoir–that's the term we use for storage, storage of water–and we had enough capacity in that reservoir to completely stop that whole flood right there, and then downstream from our dam, of course, there was no flood damage. Had Tiber not been there, we would have had millions and millions of dollars of flood damage downstream clear to the Missouri River and close to Fort Benton, and probably lost several more lives. I think there

were thirty or forty people who lost their lives when the two dams failed above us.

Storey: Now, if I'm recalling correctly, Reclamation built some Indian projects which were then turned over to the B-I-A. This dam that failed was not one of ours, was it? Or do you know?

Rawlings: That's a debatable question. I think if we checked the history, we would find that probably Reclamation did build Lower Two Medicine Dam for the Indian Bureau.[22] And then when it was constructed, we pulled out and the B-I-A, Bureau of Indian Affairs, took it over and has operated it ever since. That has never been brought to the surface, however. We've always said we've only lost one dam in our career and that was Teton [Dam] in Idaho. But I think if you check the records, I think our alibi was that we were not operating that dam. Really the reason the Lower Two Medicine failed is the dam was not operating properly. The gates were stuck. There's a long story there.

Storey: And do you happen to know if that was an irrigation dam?

Rawlings: Oh, yes.

Storey: It was?

Rawlings: It was an irrigation project that we, Reclamation, built for the B-I-A on the Black Feet.

Storey: Was the dam subsequently replaced?

Rawlings: Yes. Reclamation got the job, and we came right back in, and within a year and a half we had both of those dams back in place. So well trained and capable Reclamation is, we built two dams and had them back online within eighteen months of their failure, Lower Two Medicine and Swift. It's a remarkable accomplishment, but it just proves and shows the world how well trained our outfit was at that time. I'm not sure we're there now. I think we've lost a lot of our expertise. Old heads are retiring.

Storey: Any other drainage situations that came up while you were still at Great Falls?

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[22] The 1964 flood caused 30 deaths and over $60 million in property damages. For more information see, Association of State Dam Safety Officials, "Lessons Learned: Case Study: Swift and Two Medicine Dams (Montana, 1964)," Swift and Two Medicine Dams (Montana, 1964) | Case Study | ASDSO Lessons Learned (damfailures.org) (Access 5/2022); For more information on the Blackfeet Project, see Garrit Voggesser, "The Indian Projects: Blackfeet Project," (Denver: Bureau of Reclamation History Program, 2001, https://www.usbr.gov/history/ProjectHistories/INDIAN%20PROJECTS%20BLACKFEET%20PROJECT.pdf.

Rawlings: I think that was about it on Great Falls. Then in 1968, it was about three years later after I went back to Great Falls, I was transferred to Billings in a new job assignment. I was appointed Chief of the Irrigation Operation and Maintenance Branch for the region. In that capacity, I was responsible for actually overseeing the operation and maintenance of all the existing projects in the Upper Missouri Region.

Chief of Irrigation and Maintenance Branch

Storey: Why do you think that move took place? What happened?

Rawlings: You mean why I went from Great Falls to Billings?

Storey: Yes.

Rawlings: Well, I wanted a raise, for one thing, and I think that I competed for the job, I put in for it, and I was selected.

Storey: So, you wanted to move from Great Falls to the region then?

Rawlings: Well, I like Great Falls and I could have lived there forever, but I wanted an advancement, and that was an opportunity. I had grown up in Billings, so it wasn't foreign to me, and I felt that would be a good place to raise my family. So, when I was selected, I took the job.

I think one of the things that put me on top of the list for getting that job was my experience as the manager of the Helena Valley and Crow Creek units.

Not too many people in Reclamation had the opportunity to actually make a project work. We were all engineers and we enjoyed designing and building monuments to society and to ourselves, but very few of us had to opportunity to make them work. And this is one of the opportunities that I had, and I think it helped me prepare myself for more responsible assignments. So, I think that was one of the reasons why I selected for the job in Billings.

Kermet Kober was the water, land, and power supervisor at that time, and he's the one who hired me. He, incidentally, also lives in Denver.

Storey: K-O-B-E-R?

Rawlings: Yes. Kermet, K-E-R-M-E-T, I believe it is, Kober.

In the job as the chief of the O&M Branch there in Billings, one of my primary functions was to conduct a review of operation and maintenance of all the projects. That is, every three to six years we would take a team of engineers to a project and go over the operation and maintenance program with the entity that was operating the project. In most all cases, it was the irrigation district by that time had taken over. We would, as a team, go out and review the canals, the laterals, the drains, and the dams and the reservoirs and write a report on the conditions that we found, the deficiencies that we found, and recommendations on how to correct the deficiencies. That was one of the big responsibilities that I had in that job.

Also, I was responsible for the preparation and the ultimate numbers that came out of planning reports that were being prepared to build a new project. In one section of that planning report was the drainage appendix, that's what I was responsible for in Great Falls. Another appendices was the operation and maintenance and replacement appendix, and I was responsible for that when I was in the O&M shop in Billings. There we had to estimate what it would cost to operate and maintain a project if we built it, and how much the farmer had to pay per acre if we built the project. This is repayment capacity I was telling you about. So that was a big part of my work there during those years as the O&M Branch Chief. That was in 1968.

Regional Water, Land, and Power Supervisor

In 1974, I was promoted to the Regional Water, Land, and Power supervisor job, and that was the head of the division in the region. In that division we had lots to do. One was the drainage; the other was the operation and maintenance of the existing projects; the other was contracts and repayments. We developed all of our repayment contracts and the repayment ability of the farmers and negotiated those contracts with the farmers if we built a new project. Here is where the Garrison Diversion Unit came into play and the Oahe Unit that was from South Dakota. Those are two big units that we were working on at that time.

Also, we had the Fish and Wildlife in my division there. I was responsible for all the fish, wildlife, and recreation in the region. I had the power under my authorities. In other words, I was responsible for all of the power that was produced in the region. During my tenure as the water, land, and power chief, we expanded from the Upper Missouri Region to the Missouri Region. You remember we combined the Upper and Lower Missouri Region into the Missouri Basin Region? And then a few years later we combined what we call the Southwest Region into the Great Plains Region. So, when I retired, or left that job, we had nine-state regional area rather than the four-state regional area that I started out with. [Tape recorder turned off.]

Storey: Division Chief, the broad responsibilities of that office.

Rawlings: Is that running now?

Storey: Yes, it's running now.

Rawlings: One thing that I believe that I failed to mention that was my responsibility was to market municipal and industrial water out of all the reservoirs in the Missouri Basin Region, then later the Great Plains Region. But there was a lot of activity in the mid-seventies for several years about coal development. Remember when that big flurry came–

Storey: Yes, and the big pipeline proposals.

Water Marketing

Rawlings: The big pipelines. So, a lot of the oil companies, just preparing themselves to be ready, they came to Reclamation to buy water. Reclamation had the responsibility to market water not only from Bureau reservoirs, but the Corps of Engineers' reservoirs as well. That's the big ones on the main stem of the Missouri, starting with Fort Peck and Garrison, Oahe, Gavins Point and so on. And Yellowtail [Dam][23] was in everybody's eye at that time. That's the big reservoir here on the Bighorn River in Montana.

We had declared that we had over a million acre feet of water there that could be made available for coal development, and so we put a program together which I headed up to market that water. The way we did that, the coal company came to my office and said, "We would like to buy 50,000 acre feet of water annually from Yellowtail, but we're not ready to use that water right now until we line up our coal development project." That could be a number of projects, one might be a coal slurry pipeline where water and coal would be mixed and you'd pipe it to Arkansas, for example. Another one might be where you'd have a power plant that was coal-fired, and for cooling water, they needed Yellowtail water for that.

Well, to make a long story short, we had contracts with, I suppose ten or fifteen different companies and we sold up to, I believe 650,000 acre feet. They

[23] Yellowtail Unit in southcentral Montana is part of the Pick-Sloan Missouri Basin Program. It is a multi-purpose development providing irrigation water, flood control, recreation, and power generation. Constructed in 1966, Yellowtail Dam is a thin arch concrete dam 525 ft. in height with a crest length of 1,480 ft. For more information see, Carolyn Hartl, "The Yellowtail Unit: Pick-Sloan Missouri Basin Program," (Denver: Bureau of Reclamation History Program, 2001), https://www.usbr.gov/projects/pdf.php?id=175

had it on a standby basis where they only paid a portion of the total cost per acre foot during the standby period. Then when their project came online and they began to consume the water, then they'd have to pay the full rate.

Those contracts were in effect for about ten years, and then because the coal development didn't come about, the companies were interested in canceling those contracts. We were interested by that time to get them canceled as well, since the water was not going to be used in that manner. So, they then phased out of the picture, those contracts. But that was the time when the environmental impact statement requirement was really coming on strong.

Storey: [unclear] was one of the big pipelines, for instance.

Rawlings: [unclear] was one, and I was heavily involved in that. In fact, was responsible to draft the contract for [unclear] and get it executed, which we did. But that didn't happen because of political and other reasons. It was a wonderful project. It's a good way, in my opinion, to transport coal–very efficient, very quiet, as opposed to a train system to transport the coal and all of the environmental impacts that a train has going across the country.

Storey: Do I remember that water politics played into this somewhere and the states from which the slurry pipelines would originate were upset about "losing water"?

Rawlings: Well, the state of South Dakota was where the [unclear] water was coming from, and they were very much in favor of the project.

Storey: Oh, okay.

Rawlings: What stopped that was the railroads. They didn't want the competition, and they were strong enough politically to stop the [unclear] project. There was a lawsuit involved. But the bottom line was that it was friendly abandoned, even though we did have a contract with them for the water. And the state of South Dakota stood to benefit a lot of money from that project by allowing that water to leave their state for that pipeline, and it was just a very, very small amount of total water out of the Missouri River. Fourteen million acre feet annually passes St. Louis in the Missouri River and goes on to the Gulf of Mexico. That pipeline, the contract was for, as I recall, 50,000 acre feet.

So, you can see, you couldn't even measure that amount in the river system, hardly. Compare 14 million that's flowing out after all uses, flowing past St. Louis, and the state of South Dakota wanted to take 50,000 acre feet out of the Oahe Reservoir, which itself holds about 25 million in storage. You can imagine trying

to measure that 50,000 acre feet in a 25 million acre foot reservoir, it didn't take very much water out of there. You couldn't see it with your naked eye.

It's just unfortunate that it didn't happen, because there's new technology there that was being developed, and it would have been a real great thing for this country to have that experience to take coal that way. You could move a lot of things by that method–wood chips, all kinds of things. It would take some of the load off of our interstate system, trucking, and also the railroads. Anyway, it didn't happen.

But I wanted to mention that one of my responsibilities was that water marketing. That created a lot of interesting meetings over several years. The downstream states are concerned, like you say, about taking water out of the Missouri River system. They want to use the water in Missouri for barging and for consumption, municipal consumption, and for recreation and so forth. They have not much concern about what happens to the upstream states and our reservoirs and so forth. That's been a longstanding battle, upstream states versus the downstream states.

Storey: On the Missouri.

Rawlings: On the Missouri.

Storey: Are there any particularly vocal upstream and downstream states that stand out in your mind?

Water Disputes

Rawlings: Oh, well, yes, North Dakota and South Dakota and Montana and Wyoming waged a lawsuit against the Corps because of their operation of the reservoir, saying that they were favoring the downstream people and evacuating water out of the reservoir during the drought period so rapidly that their recreation potential was lost, for the benefit of the recreation potential and other uses downstream.

Then that resulted in the Corps taking another in-depth look at their operational program, annual operating plan, they call it. That's in the process right now. They've got to take into consideration more than just barging. They've had to look at the environment upstream and the environment downstream and try to strike a happy medium so that they'll all be happy. That is a real big chore. That's in the process now. They're writing an environmental impact statement on their operating plan. And of course, God and everybody gets a chance to review that, including the ten basin states and the environmental groups of all kinds. The Indian

tribes, they're heavily involved or want to be here. They're saying that the Corps has ignored them, so they're involved. So, it's interesting.

Storey: If we go back to the time when you were the Branch Chief, the O&M Branch Chief, you mentioned that one of the things you did was go out and do reviews. Did you ever have situations where there were identified O&M needs and the district said, "No, we don't want to do that"?

Rawlings: Yes, almost every time.

Storey: Tell me about it. What was it about and why was it going on, and all that kind of stuff?

Working with Irrigation Districts

Rawlings: Well, I think the reason that the farmer didn't want to complete the recommendation. For example, let's say that there was a big canal that we had built years ago that was an earth section ditch or canal, and it was leaking badly. We might go out and say, "We think you should line that canal," and they would say, "Well, that's fine. We're getting along fine just the way it is. We don't want to have to spend that money to line that canal."

And the reason that we or somebody would recommend lining the canal would be several. One might be to save enough water that we wouldn't have to divert so much water out of the river, thereby keep more river in the water below the diversion dam for the fish and recreation. Yet the farmer has to take the money out of his pocket to line that canal he's been using for fifty years without lining, and he says, "Well, why doesn't the fisherman pay for the lining in the canal if they want the water?" See how this happens? And that's the type of thing you would run into.

If we recommended something that was of a critical nature that if they didn't fix it, its structure would fail and they wouldn't get their irrigation water, we usually didn't have any problem at all of getting them to fix it. So, it depends on the situation and what you're recommending on whether or not you ran into opposition from an irrigator, and that made it interesting to negotiate those conflicts and trying to come to a middle ground. Many times–

Storey: Do you remember any particular situation? Excuse me, you were going to say something.

Rawlings: Well, I was just going to say many times we would see a problem that needed to be

fixed, and we knew full well that they didn't have the money to do it. So, then I would make arrangements to do one of two things, get them some emergency money and loan it to them, they'd have to pay it back over time, or going to a rehabilitation and betterment program, we called it an R&B program, and do it through that avenue. And that would make interest-free money available to do the work, and they'd have to pay it back over usually a twenty- or thirty-year period.

Also, when we were out on these review of operation and maintenance, we were able to see the old systems that were built, my gosh, at the turn of the century, and we would realize that they're obsolete, a lot of their structures and the methods that were used to control the water were obsolete. The structures were fifty to seventy-five years old, the concrete was starting to fail, and that the project would need a complete rehabilitation and betterment program.

And then that would lead to–and this was another function that I had to my shop–writing out an R&B report, convincing the farmers that they had to spend, in one case, in Wyoming was a $6 million program, another one was eight up in Montana, then there's a $40 million one on the Belle Fourche that I wanted to tell you about. And it was my job to get that report prepared and get it to Congress and get authority to go ahead and do that work.

These reviews of operation and maintenance led to those kinds of things, and it also kept the Bureau of Reclamation and the farmer close together rather than having a situation where it was "we" and "them." My philosophy was to keep in contact with the farmers and the irrigation district board of directors and have it a team. And if I could get out on the project at least every two or three years formally, but intermediately see them in between those reviews, then I kept a good rapport with those folks. They would come to us for engineering expertise rather than putting off doing a job or going to somebody that wasn't really qualified to help them.

So, I thought this review of operation and maintenance was an excellent program. We didn't charge them for that service, for the review itself and preparing the report. Now, if we had to do anything beyond that, then they'd have to pay for our services.

But now, since I've gotten out of that job, the administrations that were in power have said, "You ought to start charging those folks for that review," and what that has done, it's driven a wedge between the Bureau and the farmer. If they think they have to pay for that review, they aren't going to ask you to come out.

As a result of that, then, the operation and maintenance of the system

deteriorates more and more. They procrastinate and they don't do what they need to do on an annual basis, and then lo and behold, in twenty years you find that everything is in bad state of repair, and you've got to have a big R&B program. There's a law on the books that says we can loan them interest-free money to do that, although the current administration, they have said, "We're not going to do that anymore," even though Congress has allowed us to do that by an act of Congress establishing these R&B [unclear].

So, it's unfortunate that's happened, although I think that's kind of what the government is wanting to do, is to get the government people out of the construction business, out of the water development business, and turning it over to the private sector.

Storey: Well, I would like to keep going, but my time is up I'm afraid–

Rawlings: Oh, it is, isn't it?

Storey: I'd like to ask you whether or not it's all right for researchers from within and outside Reclamation to use these tapes and the resulting transcripts for research.

Rawlings: Sure.

Storey: Good. Thank you.

END SIDE A, TAPE 2. MARCH 6, 1995.
END OF INTERVIEWS.