ORAL HISTORY INTERVIEWS

DONALD (DON) J. DUCK
1996

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STATUS OF INTERVIEWS:
OPEN FOR RESEARCH

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Interviews Conducted and Edited by:
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Senior Historian
Bureau of Reclamation

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Oral History Program
Bureau of Reclamation
Denver, Colorado

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STATEMENT OF DONATION
OF ORAL HISTORY INTERVIEWS OF
DONALD J. DUCK

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, Donald J. Duck, (hereinafter referred to as "the Donor"), of Conifer, Colorado, 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 February 7, February 12, February 20, and February 26, 1996, at my home and on the Denver Federal Center, 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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Date: 2/26/96 Signed: Donald J. Duck
Donald J. Duck

INTERVIEWER: Brit Allan Storey
Brit Allan Storey

Having determined that the materials donated above by Donald J. Duck are appropriate for preservation as evidence of the United States Government's organization, functions, policies, decisions, procedures, and transactions, and considering it to be in the public interest to accept these materials for deposit with the National Archives and Records Administration, I accept this gift on behalf of the United States of America, subject to the terms, conditions, and restrictions set forth in the above instrument.

Date:_____ Signed:_____
Archivist of the United States

Brief Chronology of the Life of Donald (Don) J. Duck

1930, August 8 – Born

1949, February – Started College at Rose-Hulman Institute of Technology in Terre Haute, Indiana

1950, October – Enlisted in the Air Force and stationed largely in Alaska

1959 – Graduated from Rose-Hulman Institute of Technology

June 1959-January 1964 – Flaming Gorge Dam construction

January 1964-August 1967 – Yellowtail Dam construction

August 1967-August 1972 – Grand Coulee Third Powerhouse construction

August 1972-1980–Deputy Director, Office of Design and Construction, Bureau of Reclamation

1980-1986–Chief of Construction, Harza Engineering Company

1986-1987–President of Harza Engineering Company

1987-1990–Chairman of the Board, Harza Engineering Company

Retired to Conifer, Colorado

1999–Died

Introduction

In 1988, Reclamation began to create 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 ta on the whole range of Reclamation's history); making the preserved data available to researchers inside and outside Reclamation.

The senior historian of the Bureau of Reclamation developed and directs the oral history program. Questions, comments, and suggestions may be addressed to the senior historian.

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Oral History Interviews of Donald (Don) J. Duck[1]

Storey: This is Brit Allan Storey, Senior Historian of the Bureau of Reclamation, interviewing Donald [Don] J. Duck, a former employee of the Bureau of Reclamation, on February the 7th, 1996, at about nine o'clock in the morning, at his home in Conifer, Colorado. This is tape one.

Mr. Duck, could you tell me please where you were born and raised, and educated, and how you ended up at the Bureau of Reclamation?

Born in Sanford and Raised in Terre Haute, Indiana

Duck: I was born in Sanford, Indiana. Small town, like seventy-five population. Moved to Terre Haute, Indiana, when I was about two years old, and ultimately wound up at

Attended Rose-Hulman Institute of Technology

Rose-Hulman Institute of Technology. It was called Rose Polytechnic, at that time. It was a private, men's engineering school, well known in the Midwest, not so well known anyplace else.

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1. n.b. – The interviewee was obviously concerned that his name not be associated with the cartoon character, Donald Duck. Upon first meeting he immediately introduced himself as "Don Duck."

Started College in February 1949

Started college in February 1949.

Enlisted in the Air Force During the Korean War

The Korean War came along, and I enlisted in the Air Force in October of 1950, and spent three of the four years in the Air Force, in Alaska, at Elmendorf Air Force Base.

Stationed at Elmendorf Air Force Base in Alaska

Loved Alaska. Left Alaska, fully intending to go back.

Went Back to College at Family's Insistence

However, the folks and all my relatives insisted that I return to college, finish college, and then I could do what I wanted to do. That was their influence.

Attended College on the G.I. Bill

Anyway, I ~~graduated,~~ went back, had four years of G.I. Bill. In spite of the fact that I had a lot of the two-year prerequisites out of the way,

Graduated in Civil Engineering in 1959

I took a full load, filled out with mechanical engineering courses, but graduated in civil engineering, in June of 1959.

Spent Time in Alaska Doing Survey Work

During the process of job placement, and so forth, at the school– incidentally, I spent the three years in Alaska in surveying. It was just like having an ordinary job. I did all kinds of surveying, headed the surveying group at Elmendorf Air Force Base. Therefore, with that background, I continued in civil engineering.

Job Opportunities upon Graduation

In going through the interview process, I had a couple of job opportunities, at that point in time, between eight- and nine-thousand-dollar-a-year offer, which was pretty good money in those years.

Interview with Bureau of Reclamation

The head of the civil engineering department, Professor McLean, said that this group from Reclamation was going to be on campus, interviewing, and he thought that I ought to talk to them, with my background, my interest in [construction] ~~school~~, and all, that I should talk to these folks from Reclamation, who I knew absolutely nothing about. But I signed up to interview with them. And included in the group turned out to be a good friend for years, and for the life of me, I can't remember his first name, but he was the Personnel Officer in Salt Lake City. Name was Mitchell.

Offered a GS-7 Position

They had a heck of a presentation on the upper Colorado River Storage Project, which included Glen Canyon and Flaming Gorge. Both projects were just going under construction. They offered me a–well, ultimately offered me a GS-7. Of course, I was a little older. I was twenty-nine years old when I graduated. As I recall, the salary was $5,430 a year. My folks thought I'd lost my mind.

June of 1959 Moved to Flaming Gorge Damsite

Nevertheless, they offered me a job on Flaming Gorge Dam, and in June of 1959, we loaded up. Had a year-old daughter. We made the trip to Flaming Gorge, by way of the old U.S. 30, through Rock Springs, Green River, and out across the Sagebrush Flats into Dutch John Gap, Ashley National Forest. You know, that whole drive across Wyoming, I couldn't see a dam site anyplace. It really opens up as you go into the Ashley National Forest.

Just Setting up Camp in Dutch John

But anyway, by the time we got there, my wife had decided we should take a job I'd been offered in Alaska. She didn't think much of Rock Springs, Green River. Of course, they were just setting up a camp in Dutch John, and it was pretty bleak. Nevertheless, I said, "We're here. We've taken the job. We're going to try it."

Worked in Construction Inspection

I took an assignment with the construction inspection group, got myself into a little bit of trouble the first week. I was relieving an old technician/ inspector who was given to kind of playing tricks on new people, name was Bill Grimes. He was a unique character. He had been a driller, had taken this job with the Bureau, and was kind of a chief inspector on excavation. He really was good with powder blasting. He followed me for several years, from Flaming Gorge, to Yellowtail, to Grand Coulee. Bill was a character.

At any rate, I was inspecting on a road cut job–drilling, blasting, steep cut on the left abutment of Flaming Gorge Dam. As Bill went off shift, he gave me a station, and he says the contractor can't drill beyond this until that rock cut was scaled.

Required Scaling above Some Work

It got me into a confrontation with the contractor, the foreman, and the superintendent. Everybody on the job knew about it, but we shut them down. We didn't permit them to go ahead.

Bill Groseclose, who is a friend of mine–had lunch with Bill yesterday, we had a drink or two and reminisced a little bit–was the shift supervisor, and he was called out. This is the first week I was there. And made it stick. There wasn't anything in the specifications, but

the *slope needed scaling*. There was no question about that.

Storey: What does that mean?

Duck: We didn't really have any authority to shut them down, but we shut them down, got them to scale it.

Storey: What does that mean– scaling?

Duck: Scaling? Cleaning loose rocks off the slope up ahead. This was a deep cut, and you know, from 100 to 200 feet above us. As you move under it, it needs to be cleaned down, and it needed to be scaled.

Storey: So that it's safe?

"In fact, construction safety kind of began there at Flaming Gorge, Glen Canyon. . . ."

Duck: So that it's safe. That was before you had anything *much* in the way of safety requirements in construction specifications. In fact, construction safety kind of began there at Flaming Gorge, Glen Canyon. The emphasis on safety became a lot more significant than it had been in the past.

Work organized into three shifts

Anyway, as the dam construction got under way, they organized into three shifts–a day shift, swingshift, graveyard shift.

Selected to be a lead construction inspector

And Russ Borden, who was the Chief Inspector at that time, selected Bill Groseclose, Darrell Hansen, and myself to be the lead inspectors on each of those shifts.

"No one of the three of us really had much dam experience. Naturally, mine was zero. . . ."

Each of us had a crew of inspectors that were responsible for the construction inspection of everything that was going on. No one of the three of us really had much dam experience. Naturally, mine was zero. I think all three of us had *not* been associated with *dam* construction. Darrell may have been on surveys, related to dam construction.

But anyway, here we three were selected to be responsible for supervising the inspection that went on in that project.

Met Roscoe Granger, Field Engineer at Flaming Gorge

Of course, the first guy I met when Dolores and I drove into Dutch John, was Roscoe Granger, who was a field engineer for Flaming Gorge. Gene Walton was construction engineer.

Gene Walton Was Construction Engineer at Flaming Gorge

Gene Walton had come over from the Davis

Dam project, and Roscoe came from a project in California–arch dam in California, Monticello Dam.[2]

"So you had the Davis Dam group, and then Roscoe with his Monticello Dam group, which is true of every project that I ever worked on, you had these different people that were drawn in from other projects, and you make the mix again, and go on and build . . ."

So you had the Davis Dam group, and then Roscoe with his Monticello Dam group, which is true of every project that I ever worked on, you had these different people that were drawn in from other projects, and you make the mix again, and go on and build whatever you're trying to build.

Roscoe was a sage of the Bureau. He was a favorite of Grant Bloodgood, of Barney Bellport. And that's the other thing.

"At that time, those of us who got involved . . .were really getting in on the last of the big dam building era. . . ."

2. Note that 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.

The transcriber and editor 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.

At that time, those of us who got involved, that were my age group, little younger, little older, whatever, were really getting in on the last of the big dam building era. We were close to, touched on, some of the great names in dam construction, dam engineering.

"It was a *great* time to be with the Bureau of Reclamation *if* you were interested in dams, dam construction, large projects . . ."

It was a *great* time to be with the Bureau of Reclamation *if* you were interested in dams, dam construction, large projects, which, you know, I spent my *life* in the large dam project area.

Anyway, we were close to finishing Flaming Gorge, and there were lots of interesting things that happened at Flaming Gorge that taught–you know, we were on the learning curve, and the learning curve was pretty damn steep.

Storey: Tell me about it.

Concrete Development in Reclamation

Duck: Well, concrete, you know, mass concrete–and, of course, Boulder Dam, Hoover Dam, Grand Coulee–a lot of those reports, the history of those projects, you know, developed the technology for what was being used for Glen, Flaming Gorge, and later projects. Concrete problems–some of the things that were kind of

amusing, but really not, they were using a heavy media separation process that was demonstrated in the lab and carried to the field. The attempt was to get rid of lighter-weight, deleterious materials from the aggregate sources, and the aggregate sources were full of this kind of stuff. So the materials were kind of–the way they were handled was more or less unique for those projects.

Of course, the mass concrete, six-inch, maximum-size aggregate for mass concrete, we tried to *maximize* the amount of six-inch material, *minimize* the amount of sand, *minimize* the amount of moisture. And there were problems with the sand manufacturer.

Concrete quality control issues at Flaming Gorge

I can remember the Chief Engineer, Grant Bloodgood at that time, sent Enos Ryland out, because we were having all kinds of concrete control problems.

Fluctuations in Sand Moisture at Flaming Gorge

Of course, one of the things that we all knew, that we couldn't get anybody's attention on, was that the sand moisture was fluctuating. In the manufacturing of sand process, short of sand anyway, sand moistures were fluctuating 5 or 6 percent, which makes one heck of a lot of difference in the slump of the concrete, or how fluid it is.

Enos Ryland Was Sent to Look into the Sand Moisture Control Problem

He sent Enos Ryland to see what the problem was. Bill Groseclose was on the block with Enos Ryland, I was in the batch plant, Darrell was in the batch plant. Each of us had a function to try to control, or watch. At that point in time, the sand moisture just went absolutely berserk. One bucket would splash over the forms, and the next one would just look like a pile of rock, and we wound up with a block full of that kind of material, to where we just had to shut it down.

And then Enos went back to the lab, and they plotted the results of the sand moisture test. We were adding, each of us standing on a mixer in a four-mixer plant, adding cement, or adding water, visually, and it went to the point where the operator would put the cement in the dry batch, and the water in the wet batch. You know, the whole thing fell apart.

I got this call from Groseclose down on the block. Bill said, "Mr. Ryland doesn't believe you're putting your best foot forward."

I said, "It's the best foot I've got." (laughter)

". . . once we got Denver convinced that it *was* a sand moisture problem, then they made the contractor get it under control. . . ."

And anyway, we kind of went on from there,

got pretty much–once we got Denver convinced that it *was* a sand moisture problem, then they made the contractor get it under control. Wasn't completely under control, but a lot better than what we'd been experiencing.

"*But* everybody's objective was to get the best concrete we could in that dam . . ."

But everybody's objective was to get the best concrete we could in that dam, and, ultimately, it's a great project.

Storey: How did they get the moisture content under control?

Duck: Stockpiled the sand, and the intent was that it drained for three days.

Storey: That way they got a stable moisture content?

Duck: Yeah, get a stable moisture content on it. We never did get to three days, but you get *some* time on it. By even twenty-four hours, if it drained for twenty-four hours, it was more consistent than just coming out of the processing plant.

Storey: But it wouldn't be normal for you to be in the batch plant adding cement to the mixture, would it?

Duck: Hell, no. (laughter)

Storey: So that was an unusual situation, trying to get things under control?

Duck: Trying to get things under control, right.

Storey: And figure out what was going on.

Duck: Yeah.

Storey: What did Mr. Ryland do?

Duck: He was a liaison officer in the construction group, in the Denver office, so he was Grant Bloodgood's eyes and ears to come out to the projects and see– Mr. Ryland was a unique individual, too. Got to be great friends with him. You know, you're looking back at just starting out. All of us were pretty much unknown quantities. Of course, Russ Borden, you know, had worked with Ryland before. Russ was a–that was his first *big* project. He'd always been on those smaller irrigation projects. Been on some dams, but big difference between the large projects and the smaller irrigation projects, those that, you know, had a power component.

"We never had any problems with money . . . the water conservancy districts . . . had a lot more problems with funding and with money than any of the power projects did . . ."

We never had any problems with money, or getting money for them, or whatever. The irrigation projects that were being funded–you know, my irrigation users, the water conservancy districts, and a lot of them had a lot more problems with funding and with money than any of the power projects did, really. It

took me a long time to realize that. In fact, I spent my entire field career– Flaming Gorge, Yellowtail, Grand Coulee Third Powerplant–we never had any problems with the money, with the funding, like I saw later when I came here to Denver.

Storey: Was Mr. Ryland telling you what to do in the field?

Duck: No.

Storey: How did this work, this relationship with the Chief Engineer?

Relationship of Projects with the Chief Engineer

Duck: Well, at that time, Chief Engineer ran the projects. It had moved from the ivory tower appearance, of the Denver ivory tower design. For years and years, that was a perception of the Denver office. You know, the ivory tower, the engineers. And when Grant Bloodgood–this is going back peripherally, and I probably wasn't even thinking about it. Floyd Dominy became Commissioner when?

Storey: In '59, I think.

Duck: Got to be close to when I started. Anyway, that's the way I remember it. I think Dominy–

Storey: Floyd became Commissioner in '59, and stayed until '69.

Grant Bloodgood Became Chief Engineer

Duck: Right. Well, Floyd brought Grant Bloodgood, who had a construction bent, a construction background, in as Chief Engineer. Now, he may have started as Deputy or Associate Chief Engineer or something else. Anyway, he wound up Chief Engineer, and, of course, they were trying to interject a construction bent to the design side of it, kind of balance out the designers telling you exactly–you know, absolute control, of these major field projects.

Enos Ryland was brought in, and I don't know Ryland's background that well, but anyway, he was brought in to head up a liaison group in the Denver office, made up of construction people, who were sent out to the projects as liaison with the Denver office. I probably have in my files a letter that he wrote back to the field after he came back to Denver. It was a *great* letter. He exonerated the field of all this, and put the responsibility on the contractor, which is where it should have been. There was *no* control on the sand moisture. He kind of hit the contractor between the eyes, and took the rest of us off the hook, you know, not being responsible for the poor quality.

Well, another thing. Gene Walton was another unique individual. These are all strong characters. The Roscoe Grangers, the Gene Waltons, those guys, they ran their project. But–I forgot what I was going to say.

Storey: We were talking about Mr. Ryland and his

letter.

Duck: Oh, yeah. The Denver office, that group, Grant Bloodgood, you know, had the authority to shut the project down, or whatever. And in the field, more reluctance. So that provided some insulation, or support, for making those decisions. We knew that the project probably should be shut down.

". . .we took six-inch cores and some eighteen-inch cores . . . [and] a couple of these core samples . . .We sent them to the Denver lab in a gunny sack. You know, it wasn't a core, it was *loose* material. . . ."

What I forgot, or what I was going to say was, what triggered this whole review, Denver, and so forth, was sent in–we took six-inch cores and some eighteen-inch cores out of the dam. Well, a couple of these core samples–and this was getting back to Walton and the way he thought–come out. We sent them to the Denver lab in a gunny sack. You know, it wasn't a core, it was *loose* material. Well, you think that didn't get to the lab. (laughter) Nobody else that I know of would have sacked them up, would have taken more core someplace else. But Gene insisted that we ship the core sample in in a sack. (laughter) Thus, Ryland's visit. And, like I say, if you could dig that letter up someplace, it's kind of typical of what you could expect at that time. It was a great letter.

Storey: Who was the contractor there?

Contractor Was a Joint Venture of Kiewit, M-K, and Utah Construction

Duck: It was a joint venture, sponsored by Peter Kiewit. It was Kiewit, M-K, and Utah.

Storey: Morrison-Knudsen and Utah Construction Company, I think it is.

Duck: Utah Construction. Not sure they were called Utah Construction then, but I believe it was. It later wasn't–it was Utah Mining and–but, Utah Construction, it was that group. Project Manager turned out to be a great friend of mine in later years, Doug Baker.

Storey: He was the contractor's representative?

Doug Baker Was the Contractor's Representative

Duck: He was the contractor's project manager. And, you know, those were the days when Peter Kiewit was still active, extremely active, in the company. Kiewit's been, and is still, one of the most successful construction contractors out there. Doug Baker–I can remember a time, which was amusing to me, not amusing to Doug at all, but Ben Williams, who kind of was a head of the construction group, out of home office, for Peter Kiewit.

Peter Kiewit Came out to Inspect the Project

But Kiewit and Williams were going to visit the site, and, of course, everybody was pretty

nervous about Peter Kiewit inspecting, showing up to inspect the construction progress. It was related, in part, to the troubles that we'd been having with concrete control and some of those kind of things.

". . . Pete Kiewit had gotten up a couple of hours earlier, he got his own pickup, and when Doug caught up with him, he had the back end of the pickup full of rubber gloves that had been thrown around. . . ."

Anyway, Peter Kiewit–Doug got all ready to drive him around in his–I can't remember what, I suppose a pickup, but anyway, Pete Kiewit had gotten up a couple of hours earlier, he got his own pickup, and when Doug caught up with him, he had the back end of the pickup full of rubber gloves that had been thrown around. You know, everybody on the construction group, you know, cold weather and all, wore those rubber gloves. I don't know how much they cost, but anyway, Pete Kiewit had a pickup load of rubber gloves in the back of his pickup. Of course, he ate Doug's ass out, as we knew he would, but that was Pete Kiewit. He was looking for every dime that was within–his target that time it was gloves.

Storey: That's interesting. How were relations between Reclamation's employees and the contractor's employees?

END SIDE 1, TAPE 1. FEBRUARY 7, 1996.
BEGIN SIDE 2, TAPE 1. FEBRUARY 7, 1996.

Storey: You were telling the story, I think, about Peter Kiewit going out on the site and finding all these fairly expensive gloves.

Duck: That was a trauma for Baker at that time, dealing with that. His people were throwing the money away.

Storey: Tell me about how Reclamation and the contractor related to one another.

"Doug, assigned one of his principal superintendents . . . They followed us around, and reported on what we were doing, . . . on a twenty-four-hour basis. I don't think I ever saw it get that bad anyplace else. But once the problem got straightened out, as far as concrete control was concerned, why, it kind of reverted back to normal relations. . . ."

Duck: It depended, kind of, on the individuals, and changed, on that project, over the years. When you run into the kind of construction difficulties such as this concrete control problem created, it was bad enough between the two groups– between Reclamation and the construction people–that the contractor, Doug, assigned one of his principal superintendents to tail Darrell Hansen, Bill Groseclose, and myself. They followed us around, and reported on what we were doing, or having our people do, on a twenty-four-hour basis. I don't think I ever saw it get that bad anyplace else. But once the problem got straightened out, as far as concrete control was concerned, why, it kind of reverted back to normal relations.

If you take it to what the individual intent was, and I think it's the reason that the three of us got into the positions that we were in, in spite of the fact that there were other senior people, more senior people on that project for those kind of jobs than the three of us really were, but we all had the same intent–work with the contractor, help the contractor, stay out of their way, and have our people do the same thing. And that carried out throughout. I think it was, to a large extent, that attitude, and intending to work with the contractors.

I always had . . . final product in mind, and you had a spec as a guide, but you didn't necessarily need to follow the letter of the specification to get the result that you wanted . . ."

I always had the idea that, you know, you had a final product in mind, and you had a spec as a guide, but you didn't necessarily need to follow the letter of the specification to get the result that you wanted, and the contractors appreciate the dickens out of that sort of approach. I spent my career that way, trying to work with contractors. Help them make money. That was my objective. If they had it bid, we wanted a product.

"We wanted a *good* product, a Reclamation-quality product. . . ."

We wanted a *good* product, a Reclamation-quality product. That's known the world over.

“But the relations get rocky, depending on a number of different things. One thing, if a contractor’s losing money, you have more difficulty getting the product you want . . .”

But the relations get rocky, depending on a number of different things. One thing, if a contractor’s losing money, you have more difficulty getting the product you want, and we spent an awful lot of years where the industry was so competitive, and the number of projects available, the number of contractors out there, everybody was underbidding. So you were working in that environment a good part of the time.

Storey: Was that the case at Flaming Gorge?

Duck: No.

Storey: That was later?

Duck: That was later.

Storey: You mentioned that you became a shift supervisor. Would that be the right term?

Duck: Principal Inspector was the title. Principal Inspector on a shift.

Shifts rotated each two weeks

And then we rotated shifts every two weeks, be on day shift for two weeks, go to swing shift for two weeks, go to graveyard for two weeks.

Storey: What were the hours for each of the shifts, do you remember?

Duck: About eight hours.

Storey: Yeah, but the time when the shifts were scheduled.

Duck: Like 7:30 to 4:30, 4:30 to 11:30, 11:30 to 7:30, something like that.

Storey: Could you walk me through a typical day of inspection when Flaming Gorge was in the process of construction?

Duck: Assuming that you're talking about when the dam was in construction. Keyways had been excavated, foundation cleaned up.

Storey: Yes. Actually, maybe I should have asked you a different question first. Let's talk about the excavation phase first. You were there for that, weren't you?

Duck: Yes.

Storey: Why don't you walk me through a day on that, first.

Excavation at Flaming Gorge Dam for the Arch Dam

Duck: Going back a few years. Excavation was going on on both the left abutment and the right abutment. In general, as I recall, we were taking 24-foot lifts. These were arch keyways,

arch dam keyways, so they had to be shaved. Arch dam design really relies on the foundation to carry the load, and the shape of the concrete dam transmits that load–water load, hydraulic load–directly to the abutments.

". . . the shape of the keyways and the abutments were of extreme importance. . . ."

Therefore, the shape of the keyways and the abutments were of extreme importance.

Laying out Blasts During Preparation of the Keyways

Well, surveys would lay out the keyway, the lift to be taken in those keyways. Drillers would move in. We, as the inspection group, had the responsibility for really drawing up the load pattern and exactly how much powder went into each hole, in each slope hole on the keyway, and preserving those keyways, the quality of the rock and so forth. Disturbing it as little as possible was also important. Looking at delay patterns and making a record of that. Then they would blast it, excavation equipment would move in, and move that material out, and you'd lay out the next blast.

Storey: Now, you say "lift." What's a lift? I understand a lift when you're pouring concrete, but I don't understand this.

Duck: Well, as I say, we were taking 24-foot lifts, *as I recall*. In the deeper excavation, I think we were pulling 24-foot lifts. Drill a 24-foot-deep

hole, a whole *pattern* of holes. Say this room, blow this room up. Kind of has the shape of a keyway. Then drill 24-foot holes on maybe 3-foot centers on the back wall, where we were shaving it, two rows, slope hold, 24-foot deep, and then pattern holes, to break up the rock, the general rock mass might be from 3- to 6-foot centers. And drill with air-track drills, and then loaded with powder, either stick powder or we were using some fertilizer and ammonium nitrate, blasting agent. And so you were taking 24 feet of rock out.

Storey: At a time.

Duck: At a time. At the lift, yeah.

Storey: Okay. A lot of historians are going to be doing this, and they aren't going to understand these terms, some of them.

Duck: Oh, yeah, yeah. You haven't run into it before?

Storey: Not for rock work. You're the first person who's ever talked about rock work.

Duck: Rock work for arch dams is as important, as the shape of those keyways. Understand that if you look at the progress of arch dam design, you can walk through the various structures Reclamation designed and had built. You know, you go to–well, Grand Coulee, gravity section. Gravity dam. The *mass* of the dam is what retains the water. To Boulder, which, I guess, is described as a gravity arch, but–

Storey: I think so.

Duck: –it's a heavy arch. There's some arch component to it. To Glen Canyon, which is a heavier–it's thinner than Hoover, but still a massive arch dam, thick arch. To Flaming Gorge, which is a thinner yet arch, but still what would be considered a heavy arch. To Yellowtail, which was thinned down, because of the change in design philosophy at that time, from Ernie Schultz to Merlin Copen.

When Ernie Schultz Retired and Merlin Copen Took over There Was a Change in Concrete Dam Design Philosophy at Reclamation

Ernie Schultz retired. Merlin Copen assumed the concrete dam design responsibility. Therefore, in the middle of the project at Flaming Gorge–or at Yellowtail, they thinned that dam up significantly. It's more like Flaming Gorge.

Louie Puls was more conservative than Schultz and Copen

Louie Puls was more conservative. Louie Puls had the influence on the initial design at Yellowtail.

Ernie Schultz and Merlin Copen thinned up Yellowtail Dam quite a bit

Then Ernie Schultz and Merlin Copen came along, and they thinned it up–reduced the quantity of material by quite a bit. Actually,

from an arch dam design standpoint, the efficiency of the arch and so forth, a reduction in mass of the concrete actually improves the design.

But you go then from Yellowtail–and actually, Morrow Point went under construction about the same time as Yellowtail–I elected to go to Yellowtail because that's where Roscoe Granger went.

"I followed Roscoe Granger until he retired. . . ."

I followed Roscoe Granger until he retired. But Morrow Point is another increment of thinning down of the arch dams. And then on to Crystal, which is a thinner, double curvature arch dam. And Mountain Park, and there's some of the other arch dams that are around that, you know, you can just see the progress in the old concrete dam design. *But* in each case, that foundation is critical.

"The preparation of the foundation, the *shaping* of the foundation, the maintaining of the quality of the rock. . . ."

The preparation of the foundation, the *shaping* of the foundation, the maintaining of the quality of the rock. Excavation for arch dams is a critical part of the process.

Storey: Now, if I'm understanding what was going on, the contractor would have been paid on some sort of a unit basis for the removal of the rock.

Duck: Cubic yard basis.

Storey: How did you keep track of that?

How Reclamation and the Contractor Assure That the Quantities Figures for the Contract Are Correct

Duck: You know, the mass is there. You know what–well, by survey. You take original ground survey sections, and then as-excavated sections, and compute the quantity of rock that was removed.

Storey: How do you arrive at an agreement with the contractor about the surveys? Is this just something you do, and you say, "Okay, here's our survey," or is it something they have to review and approve, or how does that work?

Duck: For the most part, the contractors just accepted the Bureau surveys, and, you know, they were available to be reviewed. There *have* been disputes over sections and so forth. I never really found it to be that much of a problem. Contractor usually–well, I think, going back to, like, Hoover Dam, I think the Bureau did everything. I mean, surveyed for form work, surveyed for powerplant layout and so forth, form work.

We later on–and this was true at Flaming Gorge–the contractor had the responsibility for laying out his forms, and the Bureau checked form work and so forth. They could, with their own crews, check original ground sections, as-

built sections, but we very seldom had any problem with the–like I say, took good original ground sections, and then you have the as-excavated result.

Storey: And then you send figures to the office?

Duck: Yeah.

Storey: They calculate them.

Office Engineering Work

Duck: They compute the quantities. In all these project offices, you had groups, office engineering, that did that sort of thing. And then progress payments to the contractor.

Storey: Let's see, did we get through a whole day of excavation work?

Duck: Well, I think so.

Storey: What kinds of problems would come up in excavation, or issues, if you wish?

Duck: Shut her down for a minute and let me think.

Storey: Okay. [Tape recorder turned off]

Blasting Work

Duck: Again, more related to arch dam work–the loading, the hole spacing, drilling.

Storey: The loading of the drill holes with the powder?

Duck: Loading the powder in– yeah. That was probably as much a controversy as you run into, and once you get agreement on how it's going to be done–and this goes back to Bill Grimes. At Flaming Gorge, we used stick powder on the slopes, stick powder taped to primacord, with 2-foot spacers between sticks of powder, which, for one thing, you use up a lot of sticks. But again, it's an effort to preserve those backslopes. [Tape recorder turned off]

Storey: I think you were talking about loading the holes with the sticks, and so on.

Duck: Yeah. Spacers. Two rows. The argument was always, are you going to put one row in? Is one row adequate? Are two rows necessary? We always required the two rows there, and a shorter relief hole. The patterns were laid out, pretty well controlled. Well, this was always a potential for a bone of contention about whether all that was really necessary or not.

Storey: That would be because they would save money, or because it was easier, or what?

Duck: Take less time, take less effort. You bet.

Storey: Make more money.

Duck: Make more money. You bet.

Storey: How did you pass information from one shift to another shift? Or did you?

How Reclamation Passed Information from

Shift to Shift

Duck: Well, we had what we called a pass-on book. Significant items–and the principal inspectors, it was kind of our book, we passed on information in that pass-on book, and then there were shift reports from all the inspectors. Whatever they were inspecting, whatever they were doing, they gave the status of it– what they'd done, what they'd approved, what they had turned down, maybe, or what needed to be done. And those reports always were reviewed by the principal inspector and passed on to the inspector.

Storey: How did you go on shift?

Duck: Each principal inspector had a vehicle, a carryall. We gathered up our crew at the camp, and appeared at the field office, which *might* be moved around from time to time on the project, but we would relieve–actually inspectors relieved on the site. Principal inspectors would sit down and talk for thirty-, forty-five minutes, while the relieving inspectors went directly to the site and relieved whoever was there. Then the inspectors would come back to the field office, load up, and go back to camp.

Getting Around the Damsite

Storey: What was it like getting around on a major excavation site like Flaming Gorge? How did you have to get around?

Duck: Well, there would be a central office.

Storey: That would be a building?

Duck: A field office, and then you had pickups that were available to go to more remote parts of the work. But it was walk in and walk out, then, to the site.

Storey: In a major construction site?

Duck: Uh-huh.

Storey: Is that dangerous?

Duck: Oh, yeah. Everything about a major project like that carries some risk.

Storey: What were the conditions like? I presume the field office was a little building of some sort.

Duck: Yes. Yep, shack. Shack, yep.

Storey: Or a trailer. And you'd go there, and then you'd walk or you'd drive to wherever you needed to be?

Duck: Yes.

Storey: Was there blasting going on all the time?

Duck: Well, not all the time. There was the sequence: drill, blast, clean up. Clean up, in the sense–the arch dam jobs was a matter of working a bulldozer *into* the keyway and then pushing the material into the bottom of the river. Then other equipment would be picking up out of the bottom of the river. Well, as you can guess,

when you're pushing material out of the keyway, there isn't anything going on in the bottom of the river. But as they're cleaned up, the keyways, and the danger of rock falling down into the bottom disappears, then the equipment moves into the bottom of the river and starts picking up and hauling out to some waste area from there.

Also included in that sequence is what I was talking about before, the scaling operation. You move in with high scalers and bar rock down,[3] bar loose material out of them. And that's a continuing process. Blast, muck out, scale, lay out survey, drill the holes, load the holes, move everybody out, blast, move a dozer in, push the material out. And sometimes getting the heavy equipment into those keyways, into the blasted material, was no small task, building ramps and roads and, you know, access into the keyways.

Storey: I think of keys, and I think of little things. How big is a key? Do you have a recollection of how big the keyway was on Flaming Gorge?

Duck: Varies from the top–of course, more narrow at the top. Guess, maybe 50 feet, to whatever the base width of the dam was, which might be 180 feet, 150 feet, at the bottom.[4] It tapers out.

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3. Meaning that you manually used pry bars to loosen and remove rocks.
4. The top thickness of Flaming Gorge itself dam

(continued...)

Thicker at the bottom.

Storey: And what you're seeing is the gravity aspect here, where the dam's getting wider and wider, thicker as it goes down.

Duck: Thicker as it goes down, yeah.

Inspection Crew at Flaming Gorge

Storey: How many people would be on a shift, working inspection, at Flaming Gorge? Do you recall?

Duck: Probably–it varied somewhat, but eight-, ten-, on a crew, depending. Both Flaming Gorge, Yellowtail, powerplant at the toe of the dam. So when you pretty much complete the keyway excavation, you go into the foundation, the bottom part of the excavation, the powerplant excavation, and when construction starts, you have the powerplant going with the dam.

". . . as the work progressed, the size of the crews would go up to significantly more than . . . in the early stages. . . ."

So as the work progressed, the size of the crews would go up to significantly more than they were in the early stages. But I'd say a dozen-, fifteen- max.

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4. (...continued)
was 27 feet while the maximum base thickness was 131 feet.

Storey: At the beginning, or at the end?

Duck: At the end, yeah.

Storey: Do you remember any of those folks?

Duck: Oh, my memory for names and that sort of thing kind of disappeared, but if I thought about it, I would come up with–of course, Neil Stessman started there. I think Don Fillis started there, as far as young engineers are concerned. We had a mix of young engineers and technicians. Some of the technicians–Jim Simmons, and some of the local people like Dewey Erich, Gene Briggs. I'd have to do a little thinking about it.

Storey: Well, why don't you, instead, tell me about Roscoe Granger, obviously an important person there, from your perspective. What was he like?

Roscoe Granger

Duck: Well, he was pretty tough. I always found him to be fair. He had a reputation for being hardnosed. He was a favorite of mine, and I was a favorite of his. Moved on to Yellowtail with him, and then over to Third Powerplant at Grand Coulee. He was a rather small, slight-built man, gray hair. Lot of people had a lot of fear of Roscoe Granger. He could unload about as quick on anybody as anyone I ever knew, and it stuck.

Storey: What was his position?

Duck: He had been Field Engineer for Barney Bellport at Monticello Dam, but Roscoe had worked on Hoover Dam, and had passed through, I think, Grand Coulee, when Coulee–you know, Coulee followed Hoover.

Storey: Some of the powerplant stuff, especially.

Duck: Yeah. And then it seems to me like maybe Trinity-Shasta, but Monticello was really the first arch dam, and that was one of the reasons that they brought Roscoe over to Flaming Gorge. Like I say, Roscoe was a character. Great guy to work for, as far as I was concerned.

Storey: There have to be stories about him.

Duck: He was selected, of course, off of Flaming Gorge. He was Field Engineer at Flaming Gorge. Moved over to Project Construction Engineer. He was the *head* of the field office at Yellowtail, and then the same at Grand Coulee Third Powerplant. He had the reputation that he either liked you or he didn't like you, and those that he didn't like moved on.

"He trusted me, and I got by with some things, working for Roscoe Granger, that he'd have fired anybody else on the spot, but I did what I thought I had to do. . . ."

He trusted me, and I got by with some things, working for Roscoe Granger, that he'd have fired anybody else on the spot, but I did what I thought I had to do. Never had Roscoe chew on

me for anything. It was that kind of relationship.

Storey: Did he have a reputation for chewing on people?

Duck: Yep.

Storey: Did you ever see it happen?

Duck: Yeah, I saw it happen. And probably the most interesting chewing that I–happened over the telephone. I have a couple of different incidents, if you want to jump ahead.

Storey: Sure.

Duck: When we moved into Grand Coulee Third Powerplant, there was already an operations group there, operations and maintenance. That was an operating facility. Big organization. And you may get a *different* reaction from some about–

END SIDE 2, TAPE 1. FEBRUARY 7, 1996.
BEGIN SIDE 1, TAPE 2. FEBRUARY 7, 1996.

Storey: This is tape two of an interview by Brit Storey, with Donald [Don] J. Duck, on February the 7th, 1996.

You were talking about how construction people related to the operating people at Grand Coulee, I think.

The Staff Stationed at Grand Coulee Wasn't

Thrilled to Have a Big Construction Project like the Third Powerhouse on the Doorstep

Duck: Right. Established group, not really thrilled with having this big construction group move in on top of them. And, of course, the operations people–you know, things are pretty well set. Your routines are pretty well set. Well, we absolutely–you know, a construction group moves in, and you have a job to do, and you're going to do it. And things begin to happen, begin to change. Of course, we had our problems with operations there.

I can't even remember what my title was at Coulee, but Howard Fink was assistant. I guess my title was Field Engineer, but Howard Fink, who came from Glen Canyon, was Roscoe's assistant. So there was Roscoe and Howard Fink. Howard Fink came out of an office engineering environment, a little different than the field, which is always good to mix those backgrounds up. And Howard's a great guy, too, but different. You know, no Roscoe Granger. But we had all kinds of confrontations–I call them confrontations, and they were kind of interesting.

One of the things that I remember most was we were driving tunnels within Grand Coulee Dam, drilling and blasting, *in the dam*, for cableways.

Setting up Coordination among the Contractor, Construction Staff, and Local Operations Staff at Grand Coulee

I was working with the coordinator that the operations group had set up to handle, to coordinate, make sure that everybody knew what was going on. I called the whole group together–contractor, operations coordinator, and our field people, you know, people that were going to supervise the work–and we laid out how we were going to start drilling and blasting in that dam, and when we were going to do it. Of course, operations had to provide, in some cases, air and water. There's air and water in the dam. You make provisions for making connections to station air and water and so forth. This all got done, like, two, three days before it was really going to take place, gave them time to get their air and water connections provided for.

The day that the contractor moved in to start work, the local Interior–I think Department of the Interior, anyway, Bureau– guards were standing there, preventing them from going to work. And you can imagine what kind of a reaction I had when I got a call on the radio that guards were there and wouldn't let Gibbons and Reed go to work. Well, I hit the ceiling, and hit Roscoe, and Roscoe hit the telephone, and the Department of Interior. He had a one-sided conversation with the Interior Secretary about this B.S. that was going on. I thought that was kind of unique. (laughter)

Storey: Really. (laughter)

Duck: And if you go back far enough, you'll

understand.

"For years and years, the Bureau of Reclamation had a superior position to the Department. . . ."

For years and years, the Bureau of Reclamation had a superior position to the Department. It was just there. I don't know whether you've heard this before, but that's–

Storey: Tell me about it.

"I just know that Reclamation occupied the seventh floor of the Interior Building, and Interior just *did not mess* with Reclamation in those years. . . ."

Duck: I don't know that much about it. I just know that Reclamation occupied the seventh floor of the Interior Building, and Interior just *did not mess* with Reclamation in those years. I think that was part of the later problems that developed. The results of that were apparent later on. As you might guess, I wasn't really interested in that, or didn't pay much attention to it at that time. But that was a *perception* that a lot of us had.

Another Coordination Incident During Relocation of the Switchyard

Anyway, he chewed on Interior pretty hard. And the funny thing about it, there was a second incident. We were tearing out–well, building a new switchyard as a part of the work

that was necessary. Tearing down the old switchyard, removing it, was a part of the work that was required. I did the same thing with the coordinator and the contractor, making arrangements for getting into the existing switchyard to start–actually, again, was hooking up the fire hydrants for construction water, was really all they were doing at that time, to go to work on the new yard. Had this all arranged. We all met, got together, and agreed. This is what was going to happen, and this was when it was going to happen.

And some operator, standing on the gate, gate padlocked, wouldn't open it, wouldn't let the contractor in.

"And that was the end of the coordinator. . . ."

And that was the end of the coordinator. I said, "Get the guy out of here. I'm not working with him." From then on, the major part of the coordination activity took place between Ray Seely and myself.

Storey: Who was Ray Seely?

Duck: Ray was the head of operations. He was the top guy. My perception was that a lot of this was coming out of Ephrata, out of the Ephrata office.

". . . there was a hell of a friction between the Ephrata office, who I think had somebody that they thought should have Roscoe Granger's job. . . ."

They had responsibility for Coulee, and there was a hell of a friction between the Ephrata office, who I think had somebody that they thought should have Roscoe Granger's job. I don't remember all the background to it, but those frictions were there between the region office, between project offices, between the operating offices, and construction. Always *seemed* to be there at the start, and by the time you finished a job, why, they all worked out.

But Roscoe, in tearing down old existing switchyards, one of the local–was really a junk dealer–got the contract for dismantling some towers.

Accident While Dismantling the Old Switchyard Towers

This is one of things that, you know, Roscoe would have fired anybody else. He didn't want this junkie tearing down, you know, working on government property. So the idea was to load these huge pieces of the tower on and truck them to his yard. Had to cross that bridge, fairly narrow bridge, and quite a bit of traffic on it. I saw this guy's operation, and it wasn't too good.

Anyway, I was letting him tear down the towers on our government property, and it was where Roscoe wouldn't normally see it, or anybody else. But anyway, he told me, "Make them haul them out of there." Well, I didn't do it. One of the workers for this junk dealer had a

flat tire on his pickup truck, I guess it was. Now, instead of getting a jack out, and jacking his truck up to change the tire, he drove a mobile crane–old, dilapidated, beatup mobile crane–down there to pick the truck up, to change the tire. Well, that was all right. I guess the thought was all right, but he dropped a Park Service antenna that was stretched across from the Park Service headquarters, just down below us, and dropped that on a 1,300-kv powerline which set the radio on fire. Didn't hurt anybody. And Roscoe never said a damn word to me about it. And we kept on tearing those towers down. (laughter) But I can tell you for a fact, he'd have run anybody else off. But you talk about unexpected. People do the damnedest things.

Roscoe Granger Retired from the Grand Coulee Job

Storey: Yeah, they sure do. Did he [Roscoe Granger] retire then, after Grand Coulee?

Duck: He retired at Grand Coulee. He went back to Tracy, California.

Storey: Was this when the Chief Engineer was still running the construction program?

Duck: Let me do some thinking about that. The Chief Engineer was still running the–this takes it back to Ellis Armstrong, Barney Bellport.

"When Ellis Armstrong came in as Commissioner, he did away with the title Chief

Engineer . . . and there was an effort to de-emphasize the control . . . of the Denver Office . . ."

When Ellis Armstrong came in as Commissioner, he did away with the title Chief Engineer, as I recall, and there was an effort to de-emphasize the control, I think, of the Denver office, and the office of the Chief Engineer. That took place– it had to be about the time Coulee started, as I recall, because we had Ellis Armstrong out there as Commissioner a number of times. I can't remember whether he was there when the project was funded. It isn't when they're authorized, or anything else, when they get funding, and when construction starts. But I kind of believe that– do you know when Ellis came in?

Storey: Well, Ellis would have come in in '69, soon after–well, '70, probably. Soon after Floyd [Dominy] left. Ellis was in '69 to '73.

Duck: Floyd would have been Commissioner. And Coulee was under way in '67, '66.

Storey: So Floyd was still Commissioner.

Duck: When that project started, it was as it had been for several years. Denver Chief Engineer had a high degree of responsibility, and it was really that way even after they changed title. That didn't make a lot of difference.

". . . the way the field worked with the Denver office didn't change at all. . . ."

Ellis had a thing about the Chief Engineer title, I think, and that got changed, but the way the field worked with the Denver office didn't change at all.

Storey: So the Denver office would have still been supervising Mr. Granger?

Duck: Yes. Well, he had two hats. Always did. Regional Director for some of the functions and the Chief Engineer for the technical activities of the project.

Ted Mermel

Storey: Did you ever run across a guy named Ted Mermel while you were there?

Duck: Yeah, sure.

Storey: Tell me about him.

Duck: Knew Ted pretty well. I don't remember what his title was, but he was, I think–

Storey: He was Assistant to the Commissioner for Engineering.

Duck: Engineering, yeah. And a kind of a technical/non-technical, depending on your perspective. But Ted had, I think, responsibility for–or, I don't know whether he was responsible for anything or not, but what he was doing was, I think, pushing the state of the art on a lot of things out on the point, on

development, of technology. He was extremely active in USCOLD, ICOLD.[5]

"The nearest thing that *I* remember about Ted was his involvement in moving to those big units at Grand Coulee. I think he had significant influence . . ."

The nearest thing that *I* remember about Ted was his involvement in moving to those big units at Grand Coulee. I think he had significant influence on how, you know, those–it went to the six big units instead of twelve smaller units, and so forth. And that was pushing the state of the art quite a bit.

Oil-filled Transmission Cable at Grand Coulee Later Replaced

Cable. I think also the oil-filled cable transmission, he was involved in that as well.

Storey: That carried it up to the terrace up there where the new switchyard was?

Duck: Right. Started up with oil-filled pipe cable systems, that later on we had a lot of difficulty with, and I think they probably replaced all of them by now. From that to a self-contained, oil-cooled cable, that I think is working all right. But at that time, there were longer systems in

5. ICOLD is the International Commission on Large Dams. USCOLD is the U.S. Committee on Large Dams.

place, but none with the kind of change in elevation that we had there at Coulee.

But Ted was a character. Interesting guy, you know. Then my contact with him probably in ICOLD, USCOLD, he headed a number of committees, I think, in ICOLD that I had some contact with him, one way or the other. But he was another thinker.

Storey: Well, we've wandered a little way from Flaming Gorge. You mentioned a Gene Walton. Tell me more about him, if you would.

Gene Walton Came to Flaming Gorge from Davis Dam

Duck: Well, Gene was–like I say, I don't know much about his background beyond, he came to Flaming Gorge from Davis Dam.

"Gene was, I guess, more of a perfectionist than most anybody that I've worked for, as far as heavy construction was concerned. . . ."

Gene was, I guess, more of a perfectionist than most anybody that I've worked for, as far as heavy construction was concerned. One of his main things at Flaming Gorge was the chamfer strips on the edges of the blocks. You know, one form could be missing, but if he took one of his walk-through inspections, and a chamfer strip was missing, or crooked, or something, why, he'd pick up on that right quick. But he had a good relationship with the Denver office.

He and his wife were great to us. That was my first job. I looked at it as old Roscoe probably was the one that decided to hire me, but Gene was Construction Engineer.

Storey: What's the significance of the chamfer strip?

Duck: You know, the dams are built in blocks.

Storey: Yeah. And rises.

Duck: Low blocks, high blocks. Well, in the corners, where the blocks join on the downstream face, we were using an inch and a half, which made a 3-inch chamfer, going up the face of the dam. And you had to have this block, this strip, in the corner of the form, to form that groove, going up the face of the dam.

"Flaming Gorge has a number of, looked like miniature dams, downstream from the dam, that were a product of Gene Walton's concern about those shale seams. . . ."

That and the fillets. Flaming Gorge has a number of, looked like miniature dams, downstream from the dam, that were a product of Gene Walton's concern about those shale seams. You know, we excavated tunnels into a number of shale seams, upstream and downstream. Well, Gene went ahead and carried these fillets out, and that was a major thing for him. His personal hand is in a lot of that stuff.

Storey: Why would he be upset about the shale seams?

Duck: Get saturated and weaken. Collapse, leak, whatever.

Storey: So, the objective of the tunnels was–

Duck: Cut that off. The objective of the tunnel was to cut off the seepage through the shale seam, and then his idea was to protect downstream, still downstream from the dam. The toe of the dam carries quite a bit of the load. As the arch tends to deflect, the toe, or downstream toe of the dam, carries quite a bit of the load. But anyone that looks at that dam and sees these big gravity walls downstream will wonder what–or some of us kind of wonder about–

Storey: What was that all about?

Duck: That was Gene's project. He's a perfectionist. He was on top of the details as much as anybody I ever worked around, probably.

Storey: What did he look like? How did he act?

Duck: He acted like–and I can't remember. His background may have been military. In thinking back now, he was assigned down in Australia to the Snowy Mountain project. Have you heard anything–

Storey: Which was one Reclamation provided assistance with?

". . . at Flaming Gorge we had a number of Australian engineers that were assigned up there, in training. . . ."

Duck: Yes. And Gene spent some time in Australia, and then at Flaming Gorge we had a number of Australian engineers that were assigned up there, in training. Had several of them. Good guys–all off the Snowy Mountain project. In fact, Reclamation had great relations with numbers of different foreign engineers, but Australia, in particular, *at that time*.

". . . Gene [Walton] came out of that Snowy Mountain [Project] . . . Then Davis Dam, then Flaming Gorge. . . ."

And Gene came out of that Snowy Mountain–had been assigned down there. Then Davis Dam, then Flaming Gorge. Kind of a military bearing. Pretty good-sized guy.

Storey: What about Russ ~~Borland~~ [Borden]? Well, first tell me about Gene's title. What was his title?

Duck: Project Construction Engineer.

Storey: So he was over Roscoe?

Duck: Yeah. Roscoe was his Field Engineer. Gene was Project Construction Engineer, and Roscoe was Field Engineer.

Storey: Okay. But I thought you said a little while ago you thought Roscoe had picked him.

Duck: Picked me.

Storey: Oh, okay. I misunderstood.

Duck: Yeah. I think Roscoe probably–knowing Gene, he probably was involved in it, too, in reviewing applications and so forth.

Meets Roscoe Granger at Dutch John

I never asked Roscoe, but he was the first person that Dolores and I ran into when we pulled into Dutch John. Roscoe was coming out of the administration building, as we were driving by with our Indiana plates, he stopped me, shook hands, hugged Dolores. He was the first person I met at Dutch John.

Storey: Now Russ ~~Borland~~ [Borden].

Duck: Borden. B-O-R-D-E-N.

Storey: Oh, Borden. Okay.

Russell Borden Was Chief Inspector at Flaming Gorge and Had Been Involved with Reclamation Projects Involving Concrete Pipe

Duck: Russell Borden. Russ was just a heck of good construction engineer, had a wide and varied background. Had been responsible for some of the early concrete pipe that the Bureau had manufactured, was manufacturing. He was around Salt Lake, in that area, at that time. Throughout the rest of his career, after I met him, he was always involved in whatever pipe the Bureau was either manufacturing, having manufactured, design, what have you, for projects all over the West. And they use a lot of pipe, a lot of plastic pipe that's turned out to be

giving them some trouble. Some cylinder-reinforced, prestressed, *large* concrete pipe down there in Arizona, they've had a *bunch* of trouble with, I understand.

Storey: On the siphon?[6]

Approached by the Construction Contractors about Working on the Problems with Siphons on the Central Arizona Project

Duck: Yeah. Used to, they've quit calling me now, but used to try to get me involved in some of that–the contractors, construction contractors. Kiewit was involved, and their CEO contacted me a year or so ago about if I could be of some assistance. I told him I didn't think I could be, therefore I didn't.

But Russ was on a number of the projects up in Wyoming–Farson. I got the impression, you know, that these smaller projects, problems with money, problems with landowners, problems with water users, the conservancy district wanting to maintain as low a cost as they could. They're paying for it, paying a percentage of it back, anyway. And anyway, he was in that region–Salt Lake–therefore, he was one of the guys that were pulled in kind of from locally. And with his background, with his experience, he wound up Chief Inspector. Darrell, Bill, and I, and like the head of the lab and a couple of other surveys, probably. Herb

6. This is on the Central Arizona Project.

Semme was Chief of Surveys. But anyway, Russ was functioning as Chief Inspector. Great supporter of mine, all of my life, even after I left the Bureau.

Enos Ryland's Liaison Group

He was one that was selected to come into Enos Ryland's liaison group *after* Flaming Gorge. So he came to the Denver office and worked for Ryland up until the time he retired.

And then he traveled out to–they had certain projects, certain areas, some of them had underground, or tunneling, experience; some, grouting. They had kind of technical specialists, although they weren't *all* specialists, in that liaison group. And they were there to provide assistance to the field. That's where his career wound up. Construction liaison. He retired. Retired at Grant's Pass, Oregon, and salmon fishing. Dug clams. That was his–yeah, used to talk to me on occasion–

Storey: That's a little ways from the clams.

Duck: Yeah.

Storey: I think we're almost at the end of our time for today, so I'd like to go back and clear up a few things.

Duck: You've probably got a lot to clear up.

Storey: You mentioned you were born, but you didn't tell me when. (laughter)

Born in 1930

Duck: That's typical. August the 8th, 1930.

Why He Became an Engineer

Storey: Okay. Why did you become interested in becoming an engineer? How did that happen?

Duck: You really want to know, huh?

Storey: Sure.

Duck: The school was there. It has a great reputation in that part of the country. It just went coed this last year–'95 was the first coed class, and believe it or not, I supported bringing the women in, for a number of reasons. But it's always been a–

END SIDE 1, TAPE 2. FEBRUARY 7, 1996.
BEGIN SIDE 2, TAPE 2. FEBRUARY 7, 1996.

Storey: You were saying this school[7] was in Terre Haute.

Duck: In Terre Haute, right.

Storey: Yeah. And it just went coed in '95.

Duck: It went coed in '95. Been a men's college. Student body, 1,000 to 1,200. Thirteen civils in my graduating class. Lot of *personal* attention.

7. Rose-Hulman Institute of Technology.

You didn't get by with anything. They knew what was going on all the time. And really respected in that part of the world. Well, you know, outdoors, the civil engineering was kind of a natural for me, although my dad was influencing me, had influenced me, into enrolling in chemical engineering. I had a confrontation, a run-in with the head of the chemistry department, my first year, in freshmen chemistry, and I had decided by then chemical engineering wasn't for me, anyway, and I just transferred to civil. Freshmen year didn't make any difference anyway. You're all doing the same thing.

Storey: You didn't ever think of going anywhere else?

Duck: Didn't think of going anyplace else.

Storey: So you had decided to be an engineer, really, by the time you went there?

Duck: Yeah.

Storey: But why?

Duck: Well, it could be the same, you know, I'd have the same reason and I probably didn't understand it at the time, but I think I had more respect for engineering than anything else. And I think it's held up. If you look at law, if you look at medicine, look at a lot of these other so-called professions, I think engineering is still there, although I question the direction that we've taken on some things.

". . . in looking back on my career, I can go all over the world and *kick* something that I had something to do with putting there, and that's a great feeling. . . ."

But nevertheless, in looking back on my career, I can go all over the world and *kick* something that I had something to do with putting there, and that's a great feeling.

Storey: Good. I'd like to ask you now whether or not you're willing for these tapes and the resulting transcripts to be used by researchers.

Duck: Sure.

Storey: Good. Thank you very much.

Duck: You bet.

END SIDE 2, TAPE 2. FEBRUARY 7, 1996.
BEGIN SIDE 1, TAPE 1. FEBRUARY 12, 1996.

Storey: This is Brit Allan Storey, Senior Historian of the Bureau of Reclamation, interviewing Donald [Don] J. Duck, a former employee at the Bureau of Reclamation, on February the 12th, 1996, at his home in Conifer, Colorado, at about nine o'clock in the morning. This is tape one.

Walking Through a Day of Concrete Inspection at Flaming Gorge

Last time, we talked a lot about Flaming Gorge, and at one point I asked you about walking through a day when you were doing

concrete inspection on the dam, and then we got sidetracked, as I recall. So let's start with that question today.

". . . concrete control, quality control was a *fundamental* objective of the Bureau . . ."

Duck: Okay. Well, of course, the concrete control, quality control was a *fundamental* objective of the Bureau, and the Bureau pioneered a lot of the concrete technology, but a day of so-called concrete control and a day of concrete placement inspection, and so forth, have to start someplace. So if a concrete placement was supposedly ready, according to the contractor, they called for a checkout. Checkout included: construction joint inspection, construction joint cleanup, form, quality of the forms, that they were in the right place, and that all the embedded materials that were supposed to be included in that concrete placement were there. The inspector would sign out on the checkout card, and if everything was as it was supposed to be, they called for concrete.

At Flaming Gorge ". . . concrete placement was by cableway system and eight-cubic-yard buckets. . . ."

Then the concrete at Flaming Gorge mixing plant–four-cubic-yard mixers, and concrete placement was by cableway system and eight-cubic-yard buckets. The plant more or less monitored in by weight, cement, sand, and the various gradations of aggregate that were supposed to be included in the mix. [Tape

recorder turned off]

Storey: ... about aggregate gradation, I think.

Duck: Right. The aggregate production process was separate, a source of aggregate, and usually the material was processed into the various sizes at the aggregate source, and then hauled and moved into the batch plant. Over the top of the batch plant were usually–wherever, and whatever process you was using, a set of final screens that did, in fact, produce the size gradation that you wanted in a concrete mix. That cement, quantity of water, and those things were all checked at the batch plant by batch plant inspectors, which included the aggregate gradation, the slump control, and so forth. In theory, the plant, if it was set up to run, would produce consistent quantities of concrete, transport it to the block–whether it was a block, or the powerplant walls, or whatever it might be, whatever the concrete was called for–maximum size aggregate, etc., slump, etc.–the plant would produce, when set up properly, that mix.

When it reached the placement, then there's always a concrete placement inspector who was responsible for seeing that nothing foreign got into the placement, got covered up, and so forth, monitored the quality of the material that was coming out, and vibrated the concrete.

"Consolidation of the concrete was also *extremely* important. Internal vibration . . ."

Consolidation of the concrete was also *extremely* important. Internal vibration, usually a four- or five-man crew, that kept the placement, at that point in time, moist. We were using mortar layer, and making sure that the mortar stayed alive, didn't dry out, that sort of thing. When the block was completed, making sure that the top of the lift was prepared so that it would be easy to clean up for the next placement. That pretty much consisted of it.

Concrete Sampling

Storey: So am I hearing correctly that there would be concrete samples taken at the batch plant, *and* then concrete samples when it was placed?

Duck: Yes, on a more or less irregular basis, but the concrete could be slumped at the placement, as well.

Storey: What did they do with the samples?

Duck: Put them back in the batch concrete.

Storey: Well, what kind of sample were they taking? This wasn't going to a lab?

Duck: No, no. It was all done at the batch plant or in the placement. So the material was just there.

Storey: So, what were they doing to it then, when they took the sample?

Checking Aggregate

Duck: If they were checking aggregate, they would take a sample, screen it through the various sampling screens, and make sure that the various sizes that were supposed to be there, were there, would be washed through, and those samples would be waste then.

Testing for Slump

Slump control, you screened out everything above an inch-and-a-half-size aggregate, and check the slump in a slump cone.

Storey: To see how much it collapses when you remove the cone.

Duck: You'd rod it X number of times in three lifts, in the slump cone, raise the cone up, set it beside it, lay the rod across, and measure the number of inches of slump. But, in fact, for the large aggregate mixes, you screened out everything, plus an inch and a half. So you're really slumping more the mortar part of it than that.

Storey: How did people get out to the blocks to do the inspection?

Duck: Walk.

Storey: What was it like walking out there?

Going out on the Damsite to Do Inspection Work

Duck: Climbing a bunch of ladders, up or down, one

way or the other, depending on where you were. When you were starting off, in the bottom, of course, you were climbing up. As you reached more than the halfway point, probably moved an inspection shack up on one of the abutments, and then climbed down to the block. So it was, you know, on foot. Climbing, one way or the other. All the time.

Storey: How long were you at Flaming Gorge?

Duck: From [June 1959] ~~January 1964~~ until [January] ~~August~~ of 1967. You interviewed Neil Stessman, you mentioned. The only other significant thing, other than kind of a routine sort of a job, one of the things that Neil might have remembered, or might remember, was placing concrete in the spillway tunnel. Flaming Gorge incorporated an incline spillway tunnel. I don't know whether anybody has talked about this or not.

Storey: No.

Concerns about Concrete Placement in the Tunnel at Flaming Gorge

Duck: For all practical purposes, the intake in–and it was tunnel, a large-diameter tunnel, if I remember right, 36-, 38 feet in diameter–inclined at about 45 degrees, to the horizontal, and then a longer section of horizontal tunnel, which was *the* method there of spilling floodwaters, flood flows. Of course, the excavation on an incline tunnel is tough in itself–that's another problem. But when it came

to placing concrete in that sloping tunnel, the contractor elected to pump from the top. This is the incline portion. Or *not pump* from the top, use gravity flow, pump into a hopper, to a pumpline or concrete line that was wired to the crown of the tunnel, and then uncontrolled discharge into the forms, and, of course, that was not consistent with any good concrete placement practice that any of us had ever been around, but it created a heck of a problem between myself and, of course, the tunnel superintendent. Just dropping the concrete 250-, 300 feet, whatever it was, and it varied, of course, as you came up the slope, separate all the things that you knew were bad for concrete placement occurred in that process. Aggregate separation, the breakage– you know, it appeared to me that the concrete was going into the form at about the speed of light. You could shut the lights off. Breakage just looked like–and, of course, I got into a heck of a–and I think Neil Stessman was on my shift at that time, and I had a heck of time with the contractor's people.

Storey: That would be the tunnel superintendent you mentioned?

Duck: Tunnel superintendent. Yeah, contractor–arch dam constructors, the joint ventures' tunnel superintendent, and we had a heck of a time over this whole thing. Well, my point, eventually, is that, you know, turned down all of these placements. One side would just look like mortar, water; the other side, rock. And dangerous. Really a dangerous situation. These guys, the concrete placement crew, vibrator

men, and so forth, down here in the bottom of this thing, with that pumpline wired in the–one of the things that they did was put a deflector on the end of the pumpline, and we all called it the "cutts compensator." (laughter) But, you know, it didn't really change anything much. And, you know, everything about it was contrary to the specification contract documents, and all this sort of thing.

But as these placements were made, they were turned down, subject to verification by taking core samples. Of course, when we were near completion, I went back in and marked exactly where I thought the core samples should be taken. *I knew*. I knew what I'd seen, *right*? I was young, and I knew what I saw, and I knew what the book said.

In the Flaming Gorge tunnel we "Took a whole bunch of core samples and *did not find one* that failed. *Every sample* looked like perfect concrete. . . ."

Took a whole bunch of core samples and *did not find one* that failed. *Every sample* looked like perfect concrete. And when the smoke all cleared, I said, "Well, you know, it didn't make any difference what your placement practice was going to be." I decided, I think I said at the time, "You could blow it in the air 300 feet, gather it up with a garden rake, and if you got it vibrated, if you got internal vibration into it, you'll probably come up with a satisfactory product." And that's the way, you know, I kind of looked at it that way. How you

handled it wasn't really as important as getting it consolidated, getting good internal vibration, and they were getting that. So that was just kind of a lesson for everybody, coming off of that. But it caused me an awful lot of grief, and it caused the contractor an awful lot of grief while we were going through it. (laughter)

Storey: I could see where that would be troublesome. And what would have happened if the core samples hadn't proven okay?

Duck: We'd have tore it out.

Storey: And they would have had to replace it?

Duck: They knew that's the risk they were taking, that we would have had them remove it. Go in and chip it out and redo it.

Storey: But as it worked out, everything turned out okay.

Duck: As it worked out, *not a single*–and I took a bunch of cores, and not a single core failed, or not a single sample failed.

Storey: Now, when you say you took a bunch of cores, did you do it personally?

Duck: No. I had a drill crew come in, with a core drill bit.

Storey: The contractor or Reclamation?

Duck: Had the contractor take it. They took the cores;

they had the equipment. But we had somebody watching them all the time. And I looked at the cores. I took a flashlight, and *looked* down the hole. I could not believe it. I *just knew* we were going to find too much rock in one place and none in another.

Storey: What did Roscoe Granger have to say about all this, or did he have anything to say? (laughter)

Duck: Of course, Russ Borden, everybody was supporting what we were doing, and Roscoe didn't *have* to enter into it. If we'd had to have taken it out, Roscoe would've entered into it, for sure, because it would have been expensive, a *heck* of an expensive proposition.

Hoover Dam has the same type of tunnel. It's the same type of spillway system, right? Never really had to be used for years. Flaming Gorge has *never* had to be used. Yellowtail–same design, same abutment. The spillway tunnel was on the left abutment. Larger tunnels–42 feet–I think, 42-foot finished diameter. Just before I left–and, you know, I had the same kind of setup there, only the contractor used a different approach to place that tunnel. He used a foot valve, which meant that they had a big hydraulic valve and they used a bigger pumpline. I think at Flaming Gorge they used an eight-inch, and we were using a ten-, twelve-inch pumpline at Yellowtail, with a control valve at the placement, which meant you opened the valve, and you'd let in so much concrete, which is, in my opinion, much better. You didn't have the

apparent problems that we had at Flaming Gorge.

Yellowtail Tunnel Failed in One Hundred Year Flood

But the bottom line was, when this was all done, they got the 100-year flood the year we topped out [Yellowtail] ~~Flaming Gorge~~, and that tunnel failed in the elbow and below the elbow.

The Designers Required Special, Difficult-to-do Finishing in the Elbow of the Tunnel

And by cavitation–and that's another story, too, you know–the designers required special finishing in that elbow section in the downstream portion of it. Has anybody talked about this at all?

Storey: No. Are you talking about Flaming Gorge, or are you talking about Yellowtail?

Duck: I'm talking about Yellowtail now. Flaming Gorge is a *large* reservoir, lots of storage. Yellowtail, less storage. But at any rate, *both* tunnels, including the Hoover spillways, Glen Canyon spillways, the finish requirements.

". . . it's impossible to get the finish required by the designers in the construction process. . . ."

And I said this from Flaming Gorge, from my first experience in it, it's impossible to get the finish required by the designers in the

construction process. It's just impossible to, you know, even go back and try to repair offsets. Anytime you try a repair, you loosen aggregate, and you're creating problems while you're trying to fix a problem.

Damage Caused by Hundred Year Flood at Yellowtail Dam

Anyway, my opinion at Flaming Gorge, it was not possible to get that finished. I demonstrated it again at Yellowtail. And this was toward the end of the project, the *finishing* of the elbow section and that section below the elbow. I turned that finish down time and time again, and just kept the finishers working on it. Bottom line was, they had the 100-year flood just before I left Yellowtail. And within a matter of hours, you couldn't get–lost the flip. There's a bucket section that once you reach, I think it was 12,000 cfs, something like that, you begin to sweep this bucket section, which had a raised lip on it. When it sweeps that bucket section, then it flips the spill flow hundreds of feet downstream and increases the efficiency of moving water through that tunnel. Well, it eroded the lower part of the elbow section out. It eroded a hole in the tunnel, in the invert of the tunnel, five, six feet deep. You know, you could stand up when we finally got back in there unwatered.

"The critical part of the whole thing was that we lost the flow through that tunnel. . . ."

The critical part of the whole thing was

that we lost the flow through that tunnel. Therefore, you couldn't spill as much as what was intended. And with moving everything through the powerplant that you could, using the outlet works maximum opening in and out, but works everything through the units as you could put through, we were still storing water, and very nearly overtopped the dam.

The result of that tunnel failure, then had a similar problem at Hoover, and then later on had to use [the spillway at] Glen Canyon and also had a lot of damage at Glen.

Correcting the Spillway Design Problem at Yellowtail, Glen Canyon, and Flaming Gorge

So the end result was a change in the design, which meant you had to go back into Yellowtail, and the Yellowtail was, I think, the first one that the [remedial] design was implemented on, cut a slot at the upper end of the curve section, the elbow section, and bring that slot above where the water surface would be, and introduce air on the boundary layer of that sheet of water. That eliminated the cavitation problem. It was tested then at Yellowtail. They did the same repair at Flaming Gorge and tested it successfully, although I don't know how long they ran the test there. Did the same thing at Glen Canyon.

So it was again an advancement in the technology. These tunnels were being built with the idea that they were going to work, but when you had to use them, they didn't work,

and the result could be pretty disastrous. First year, if we put water over the–I was actually, at the time, looking at where to cut the parapet walls and which side of the dam to put the water [through], in case we were going to overtop.

Storey: That was at Yellowtail?

Duck: At Yellowtail, yeah.

Storey: Why don't you want it to be overtopped?

Duck: Well, a powerplant right down at the bottom. You would just wipe a whole power facility out. Some dams do have overflow spillways, but they don't have a powerplant at the bottom.

Storey: Something like Coulee we're talking about now?

Duck: Well, yeah, that's a crest spillway. Have you ever been out to Strontia Springs Dam?

Storey: No. That's here in Colorado?

Duck: Yeah, up here on the Platte. Was supposed to be an afterbay for Two Forks Dam. It has a little power component, I think. But it has an overflow spillway and a plunge pool. Crystal Dam has an overflow.

Storey: Which is one of ours down on the Gunnison.

Duck: Yeah. I think Morrow Point has orifices, orifice spillways. But Morrow Point has an underground powerhouse. You know, that

facility isn't sitting right there at the toe of the dam.

Storey: When you were at Flaming Gorge, you were married, weren't you?

Duck: Yes.

Storey: You were living in a construction camp then?

Duck: Yes.

Storey: What was it like living in the construction camp?

Life in Dutch John, a Reclamation Construction Camp

Duck: It was very good. When we first moved in, we were in what were called transa, two-bedroom transa houses, which essentially were just trailer-type, mobile sort of units, but without the wheels under them. Then we moved to a three-bedroom *relocatable* transa house, and then into a permanent three-bedroom.

Storey: What's this term you're using? Transit house?

Duck: Transa. They call them transa houses.

Storey: T-R-A-N-S-A?

Duck: Right.

Storey: It was sort of a brand name or something?

Duck: Relocatable-type houses. I can't remember whether a brand name was associated with them or not. But anyway, you could move them around, anyway.

Storey: What was the social life like?

Social Life at Dutch John

Duck: Oh, you know, those camps–talking to these folks yesterday about the relationships. You know, living close together, you experience kind of the same things.

Driving out from Dutch John to Shop

Although Vernal, Utah was, only 45 miles, 44 miles from the camp; Green River was about 63; and Rock Springs, 75, that's where we did the shopping, for the most part, although there was a supermarket sort of store available there in the camp. But every couple of weeks you'd go to Green River, or mostly Rock Springs, for the supermarket and the shopping.

Each spring that I was there, the bridge went out on the highway to Green River, usually in February. Ice would take the bridge out, and it'd take a couple of weeks to fix it. So you either stayed in camp or you went to Vernal, and that wasn't that easy. You had to go through the reservoir and the construction roads. The highways weren't built at that point in time. Harder to get to Vernal then than to Wyoming.

A lot of social life. Both, you know, the construction contractors and the Bureau people did most everything together. When the tensions got the highest, why, we were a little bit farther apart, but it was kind of like a rubber band–you go back and forth, depending on how things were going. Everybody had their bridge parties. The families, you'd have everybody in camp, either for bridge or pinochle. And it'd kind of circulate around. Everybody kind of took a turn. Square dancing. A lot of the folks square-danced, and traveled to Rock Springs, Rawlins, Sheridan, and attended the square dances and so forth. A couple of guys in the camp rigged up a TV antenna, and the reception was unbelievably poor, but unbelievably good for that remote area. We did have TV.

Storey: What about construction traffic? Was that a problem?

Duck: Construction traffic?

Storey: Traffic, yes.

Duck: No, no. But you knew everybody in camp. We did an awful lot of things together, and out of those things came some of the closest friends you ever made. Near the–

END SIDE 1, TAPE 1. FEBRUARY 12, 1996.
BEGIN SIDE 2, TAPE 1. FEBRUARY 12, 1996.

Storey: You were talking about everybody wants to get out toward the end.

"Toward the end. Nobody wants to be there for the finishing up, cleaning up, all the dirty little ends that are left . . . everybody's looking to move on to . . . the next project. . . ."

Duck: Toward the end. Nobody wants to be there for the finishing up, cleaning up, all the dirty little ends that are left, that have to be done. So everybody's looking to move on to the next–at that point in time, move on to the next project. And, as I said, Darrell Hansen, Bill Groseclose, and myself, the principal inspection shift inspectors, Bill, I think, was the first to leave, and he went to transmission construction that was related to the project, moved over into the Transmission Division. Moved, like, to Craig, Colorado, I think. Don't remember specifically where he went.

". . . Roscoe, of course, was going to Yellowtail. . . ."

Darrell and I were–Roscoe, of course, was going to Yellowtail. A fellow by the name of Jim Seary was taking Morrow Point.

". . . I took the field engineering job at Yellowtail. . . ."

Darrell took the field engineering job at Morrow Point, and I took the field engineering job at Yellowtail. So they went to Colorado and we went to Montana. Of course, Darrell and "Bunch" Hansen are still probably a couple of our closest friends that we have.

Storey: How did you apply for the job at Yellowtail? How did that come out?

Duck: An announcement came out for the–I forget, I don't remember what titles and government jobs. They're all over the map. But at any rate, they were advertising for a GS-12. At this point in time, I was a GS-11 at Flaming Gorge. GS-12 at Yellowtail, in a field engineering position.

"When the thing was circulated, I called Roscoe and I said, 'You got somebody in mind for this job, or am I going to Morrow Point, or what am I doing?'"

When the thing was circulated, I called Roscoe and I said, "You got somebody in mind for this job, or am I going to Morrow Point, or what am I doing?"

He said, "It's your job. Apply." So I applied. That's the way it was done at that point in time.

Storey: What grade did you start out at when you came to Reclamation in ['59] ~~'64~~?

Duck: GS-7. GS-7, which was because of my age. I was twenty-nine when I graduated, and that interviewing group told me they were sure that they could get me in at–usually, entry-level engineering positions, at that time, right out of school, were GS-5.

"So I started as a GS-7, promoted to 9 in a year,

promoted to 11 in a year, and I was an 11 when I left Flaming Gorge. . . ."

So I started as a GS-7, promoted to 9 in a year, promoted to 11 in a year, and I was an 11 when I left Flaming Gorge.

Storey: What was the primary reason for you to go to Yellowtail? Was it because of Mr. Granger or was it because it was Yellowtail, or what? Or a promotion?

Issues Regarding Staffing of Reclamation Construction Projects

Duck: Combination of all the above. In the way those things work, and, to a certain extent, throughout my experience with the Bureau, the regions have a certain number of people that usually are coming available, or are available, within the region. A construction engineer gets appointed one way or the other, and that's always a tug-of-war, who's going to be the Construction Engineer.

At that point in time, the Chief Engineer pretty much called the shots. The Regional Directors had some input into it, but their concern was making sure that somebody–you know, their people, were placed in the job.

So the Construction Engineers, like Roscoe, had some limited choice about who they brought in. I happened to be one of the ones that Roscoe pulled in, and then there were others.

At least started out at Yellowtail, Roscoe had that operating a little different. He had two of us–Lyle Cardin [phonetic], who was in the region, on Anchor Dam, and Clint Matheny [phonetic], who was on Anchor Dam, were there in the region, and they were key people, higher level people, that Roscoe agreed to take, as well as some of the office engineering group that were there in the region.

Technicians and, for instance, survey, and so forth, came out of the Dakotas, out of Bismarck, Huron, I think. You know, kind of the joke was that Yellowtail should have crossarms on it, because they were transmission-type people. There had been a lot of transmission work there, and they were the ones that were made available from the region.

"But it's true of any job you ever have . . . that if [you] can have three or four key people that have the experience, or you have the confidence in, then you can take a whole mix of people, put them together, and make it work. . . ."

But it's true of any job you ever have, or my experience, that if [you] can have three or four key people that have the experience, or you have the confidence in, then you can take a whole mix of people, put them together, and make it work. That's kind of what Yellowtail was, kind of what Flaming Gorge was. Moving on over to Grand Coulee, that was the same thing there.

"There was never any *doubt* where I was going after Yellowtail. Roscoe *wanted* me at Coulee. . . ."

There was never any *doubt* where I was going after Yellowtail. Roscoe *wanted* me at Coulee.

"And then some of the young engineers that had been with me at Yellowtail–in fact, quite a number of them–went along over to Coulee. . . ."

And then some of the young engineers that had been with me at Yellowtail–in fact, quite a number of them–went along over to Coulee. And then Roscoe accepted the region's key people that *they* had available in office engineering and so forth.

Roscoe Granger

I think [Floyd] Dominy had significant call on bringing the Assistant Construction Engineer in, Howard Fink, who was finishing up, or had finished up, down at Glen Canyon, because of Roscoe's age and health, etc., and he lived on the edge for a lot of years, but lived to be 83-, 84. He looked like he had one foot in the grave when I was at Flaming Gorge, you know. He was a frail–and at Yellowtail, he was taking bromine, some bromine product, anyway, and, you know, packed him out to the hospital in Billings, you know, out cold. His stomach, whatever it was. The doctor told him *positively* not to take any more of that stuff.

Well, hell, you know, when I was in his office– there are a couple of things. Every time I happened to be in his office, he'd give me a little short black stubby cigar, and I had to smoke that. This is after they told him, strictly, to stay off of it–wife all over him and everything else–and he'd move a bunch of books out, pull this quart bottle of this powder out, pour a spoon of it, and down the hatch it'd go. He kept right on. It was a bromide poisoning or something. But that was Roscoe.

Storey: What were your plans for your career at Flaming Gorge? What were you thinking? Do you remember?

Duck: "Get me on to the next dam job."

Storey: So you wanted to stay in construction?

Felt Yellowtail was one of the last good projects – ". . . good bid, contractor was making money. . . . a number of things. . . ."

Duck: I loved that work, you bet. That was my thing. Yellowtail was one of the last of what I'd call a routine–again, my experience, my perspective, on the thing–good bid, contractor was making money. You know, I had done quite a number of things. I *really* got along with the project manager–M-K's [Morrison-Knudsen] project manager–that was M-K sponsor, Kiewit, and somebody else that I don't remember. I don't remember who, without going back and looking it up.

Storey: Who was M-K's manager?

Duck: Phil Soukup.

Storey: S-

Phil Soukup Was Morrison-Knudsen's Manager at Yellowtail

Duck: Phil Soukup. S-O-U-K-U-P. Soukup. And he was one of the last of the old-time project managers, construction project managers, that, in fact, *ran* his project. They didn't run it from Boise. *Nobody* told him what to do. He was responsible for it. He went in with a bid, and he came out, he either made money, or if he didn't make money, he's probably looking for a job. But that's the way, and that's the way a lot of them were, autonomous managers. Yeah, they talked to–people came in from Boise every now and then, flew in and took a look, and flew out.

Storey: From the headquarters at Morrison-Knudsen there?

Duck: Yeah, right, right. Soukup was a character. Yellowtail was the only place I know–and it's just what I know–that built a jail with the camp.

Ironworker's Strike at Yellowtail Dam

And Soukup–I guess about the time I got there, there was an ironworkers' strike. He took the strikers and locked them up in jail. Roscoe about had a heart attack. But he had the

strikers, the superintendent, and the ironworkers locked up in jail. He let them out pretty promptly. (laughter) But that's what you could expect from him. Driving son-of-a-gun.

I, as I said, had just an excellent working relationship, just got off the ground with these guys from the standpoint of helping them get foundation prepared. Just come off of [Flaming Gorge] ~~Yellowtail~~. I knew what we were looking for, and I got them going. And just the early time, you know, their superintendents, supervisory people, and I got along just great. In fact, as a Project Manager, he was always looking, you know, not what's being done this week or next week, but a month or two months down the line. He was thinking ahead all the time, how to make things work, make sure that it went the way you wanted it to go.

Asked to Have Breakfast with the Contractor's Superintendent at Yellowtail

And as a result of that, he, in his planning, he asked me to have breakfast with their crew. He had breakfast with them at their mess hall, the contractor's mess hall. Every morning, breakfast was, like, five-thirty. He asked me to join them for breakfast, but, you know, the Bureau's a part of this, you've got to know what we're going to do, so that's what I did for a year. Missed a time or two. Overslept, I don't know what. Was maybe mad at him a time or two.

"He and his cook brought trays of scrambled eggs, bacon, sausage, potatoes, whatever–two

trays, to [my] wife and I, said, 'You son of a bitch, if you can't get out of bed, why, we'll bring you breakfast.'"

He and his cook brought trays of scrambled eggs, bacon, sausage, potatoes, whatever–two trays, to [my] wife and I, said, "You son of a bitch, if you can't get out of bed, why, we'll bring you breakfast." (laughter) He was a character.

"As far as having a good bid, contractor making money, good relations, excellent relations all through the job, from the people both in the Bureau and the contractor's people, went real well. . . ."

As far as having a good bid, contractor making money, good relations, excellent relations all through the job, from the people both in the Bureau and the contractor's people, went real well. They made money, moved on to the next job. Phil left a little bit early, for Libby Dam. Libby Dam was in Idaho, Corps of Engineers job.

Storey: Way up north.

Duck: Way up north. He was there maybe a year. I was up and visiting. He asked me to come up and visit it, the site, the project, fairly early on. And then he had a heart attack, a pretty severe heart attack. The doctor told him to quit, and he just dropped everything. This old M-K manager, been there for years, tough as they come, quit. They had a home in Billings on the

golf course there, I forget what they called it. Anyway, he was on the seventh fairway in Billings. He convalesced, whatever, and then got talked into managing that club. At the same time, he either acquired, or already had, I can't remember which, a place in Palm Springs. Anyway, he died, within the last two years, down at Palm Springs.

Storey: Well, he lived a while then.

Duck: Oh, he lived for a long time after they told him to quit. It would've been '64.

Storey: I think Libby's in Montana, though, rather than in Idaho.

Duck: Right. Libby's in Montana. You're right.

Storey: I've visited up–well, but that isn't very relevant to our discussion.

". . . it was a big tug-of-war between the Corps of Engineers and the Bureau, about who was going to build Libby, and, of course, when it comes to those struggles, the Corps always won. . . ."

Duck: Well, it was a big tug-of-war between the Corps of Engineers and the Bureau, about who was going to build Libby, and, of course, when it comes to those struggles, the Corps always won. But if it had been a Bureau job, it would have been a different type structure. Libby, I think, turned out to be a heavy gravity arch. Same way with Dworshak. Dworshak would

have been–there was a struggle about who was going to do Dworshak.

Storey: I think that's an earth dam, isn't it?

Duck: That's what?

Storey: I think that's an earth dam, isn't it, or a rock dam?

Duck: It's a concrete gravity dam.

Storey: Is it? Maybe I'm thinking of a different one, then.

Duck: Might be, but Dworshak was a gravity dam.

Storey: Now, you moved up to Montana in August, did you?

Duck: Moved up there in January.

Storey: In January of '68, then?

Duck: January of '64.

Storey: That's Flaming Gorge, right?

Duck: Flaming Gorge–I showed up there in June of '59. June of '59 to January of '64, to August of '67, over to Coulee.

Storey: Okay. Now, when you moved up to Yellowtail then, in January of '64, did Reclamation pay all your moving expenses? How did that work in those days?

Moving from Flaming Gorge to Yellowtail

Duck: If I remember right, they'd reimburse you for 11,000 pounds. It was on a per-pound basis. As long as you stayed under 11,000 pounds, they'd move you.

Storey: What about housing?

Duck: Housing? There was government housing at Yellowtail. Not the same–I don't know. Have you ever seen Flaming Gorge?

Storey: No, I've not been to Flaming Gorge.

Duck: Well, Gene Walton & Company negotiated a heck of a deal on the housing at Flaming Gorge. Now, if I go back today, they look like crackerboxes. They aren't that impressive. But taking it back to that point in time, they're brick. They're really quite nice, appearance and all. Of course, they were new then, too. I keep talking about key people, but anyway, there were thirty of them, or something like that, houses for the upper level people. There were some frame houses for people down the line, supervisory people. And then trailers and transa houses.

Storey: And now we're talking about Flaming Gorge?

Duck: Flaming Gorge. And then as far as Yellowtail was concerned, there were fewer of them, probably, but Roscoe, Mary–Roscoe's wife always had a significant part of what was going on, too, let me tell you. (laughter) Mary

Granger was something else, but great gal. But they wanted a basement. Therefore, they traded off some of the finishing–not brick, they were framed, some kind of siding, asbestos siding, or something like that. About three different colors–white, green, pink, or something like that. But they were nice houses, from the standpoint of living on a construction project.

As far as I know, that probably was the last of the– I think you can attribute a lot of it to Floyd Dominy, his influence of being able to get those kinds of quarters on construction projects. Glen Canyon, Flaming Gorge, Yellowtail– the camps on those projects were great.

Storey: Was there any shock involved in moving from northern–I guess it's northern Colorado or southern Wyoming–to Montana? That time of year, especially.

Duck: Well, yeah, we hit Billings, and then, you know, it isn't that common for it to be that cold in Billings, but we made Billings, pulled into a motel. Of course, we had engine heaters tank-type heaters on everything we drove, coming out of Utah, because weather could get pretty severe there, too. For the most part, it was pretty good, but it could be.

Anyway, the night we pulled into Billings, on our way to Fort Smith, or the Yellowtail site, twenty below zero, one of the reasons that I pulled in there was because they had headbolt–so-called headbolt heater outlets. Of

course, I unloaded the car, and we got squared around the room, plugged that heater in, and promptly tripped everything out. No lights. I had, I think, a 1,500- or 2,000-watt heater. I was driving a Mercury at that time, a '57 Mercury. Anyway, I kept knocking the–they finally asked me to unplug my heater, so I did.

But then on over, and it's like all those. You move into the project, and the next day, either that day or the next day, you're on the job.

Storey: What stage was Yellowtail at when you arrived in January of '64?

Excavation Had Been Completed When Arrived at Yellowtail

Duck: Just ready to start concrete. Excavation was pretty well complete.

Storey: So the keyway was–

Duck: Keyway was completed, yeah.

Storey: And the sides into the canyon, there, as I recall, had been excavated, also?

Duck: Yeah.

Storey: So you were ready to pour the concrete?

Ready to Start Placing Concrete at Yellowtail

Duck: Ready to start concrete, yeah. I started to say,

they ran it a little bit differently. Lyle Cardin, who came over from Anchor Dam, Owl Creek Project, I think was the name of it. But there was a little concrete arch dam associated with that project, and he and Clint Matheny and some others came over from that.

How Work Was Divided among the Shifts at Yellowtail

Lyle and I alternated swing shift and day shift, and then the crews would rotate on to graveyard, without one of us being there. One or the other at that time was GS-11, supervisory inspectors, would carry over onto graveyard shift. Graveyard shift, for the most part, was simply placing concrete. The day shift, swing shift, you were building forms, putting in embedded materials. You had the other crafts working, but usually not on graveyard. It was just strictly placing concrete.

So, anyway, that was the way we operated for a year. It seems to me like it was about a year. Clint Matheny was the Field Engineer on that project, again coming from the region. Roscoe's Field Engineer–I don't know whether he'd met him before. He'd certainly never worked for him before.

And if I can reconstruct it right, I think Jim Seary in Morrow Point either passed away or got into trouble of some kind. I can't really put it together in my head which it was. But he either got into difficulties, or maybe he got sick, I can't remember which. But, anyway, they

asked if Roscoe could spare Matheny to go to Morrow Point and take the construction engineer job at Morrow Point. When they moved Matheny over to Morrow Point, then Roscoe promoted me into the Field Engineer job there. So I had gone then from coming on the project to a 12. I can't remember where I got to 13, and then he promoted me to a 14 when Matheny left.

Became a GS-14, and Later a GS-15, at Grand Coulee

And when I went to Coulee, it was GS-14, I believe. Later on, got to 15 at Coulee.

Storey: Did the work at Yellowtail differ substantially from the work at Flaming Gorge?

Duck: Not that different. The structures and all are really similar. Yellowtail is like 20 to 25 feet higher. Flaming Gorge is just right at 500 feet, and if I recall, Yellowtail is 525. Just scaled up a little bit there. Little more energy associated with the Yellowtail powerplant *than* at Flaming Gorge, but the projects were *really* similar.

Storey: If I recall, the Yellowtail powerplant is sort of a smallish, medium-size plant?

Duck: Yeah, I think three units, something like that, yeah.

Storey: Are there any particular construction issues with powerplants that are of note?

Duck: Those were, at that point in time, pretty straightforward. Really nothing that isn't–you wouldn't consider routine, construction-type problems. Yellowtail, probably the stability. There was a right abutment.

"Of course, Yellowtail is in a limestone formation, therefore *always* a question of, you know, one, is the reservoir going to hold water?"

O f course, Yellowtail is in a limestone formation, therefore *always* a question of, you know, one, is the reservoir going to hold water? You can study the hell out of them, but until you've filled a reservoir, you *really* don't know. Your best guess is that it's going to. But that was a question.

"And then that Upper Madison limestone, and a tremendous amount of grouting done, tremendous amount of foundation treatment, tremendous *quantities* of grout pumped into that foundation. . . ."

And then that Upper Madison limestone, and a tremendous amount of grouting done, tremendous amount of foundation treatment, tremendous *quantities* of grout pumped into that foundation. Grouting tunnels, extending out into the abutments, in an effort to–both grouting and drainage provided.

"Long tunnels, strictly for foundation treatment. . . ."

Long tunnels, strictly for foundation treatment. That's basically the upper portion in the Madison, and then the Amsden formation. Well, this Amsden formation is pretty much mud, and the stability of that stuff, when it got wet, on the right abutment, was always a problem, a potential problem. We were continually dealing with slides from that.

"Yellowtail was another cableway system. . . ."

And that's where the tail towers for the cableway system–again, Yellowtail was another cableway system. But I'd say foundation treatment was–

END SIDE 2, TAPE 1. FEBRUARY 12, 1996.
BEGIN SIDE 1, TAPE 2. FEBRUARY 12, 1996.

Storey: This is tape two of an interview by Brit Storey, with Donald [Don] J. Duck, on February the 12th, 1996.

And foundation treatment was different at Yellowtail. More extensive?

"Large quantities of grout, and large *numbers* of drain holes, to provide for foundation stability. . . ."

Duck: Large quantities of grout, and large *numbers* of drain holes, to provide for foundation stability. If you go to Yellowtail today–I don't know whether you've– have you ever been there, Brit?

Storey: Yes, I've been to Yellowtail.

Duck: Have you seen the so-called downstream springs?

Storey: No, I was there in the middle of the winter in January.

Duck: Springs would still be there.

Storey: I wouldn't have noticed them.

"About a half mile downstream from the dam, as the reservoir filled, these springs began to show up . . ."

Duck: About a half mile downstream from the dam, as the reservoir filled, these springs began to show up, and, of course, I was left there. Roscoe was gone. Mark Wellington Emerald Marcus, was the Office Engineer, and he was left in charge of the project, and, of course, I was responsible for the field. Drilled long horizontal holes, trying to reach these springs.

". . . the cement grout was just coming straight through. . . ."

Pumped bayrite, cottonseed hulls, woodchips, chopped-up tires, and never really significantly reduced–tried to get something to bridge cement grout, because the cement grout was just coming straight through. We drilled vertical holes from the grouting tunnels; drilled horizontal holes from the portal of the spillway tunnel. Never did stop the– reduced the leakage

around the spillway outlet portal a little bit, but the springs downstream, never really touched them.

". . . there's about a hundred second-feet, which is a significant amount of water, that's coming out of that left abutment. . ."

And there's about a hundred second-feet, which is a significant amount of water, that's coming out of that left abutment, about a half mile downstream from the dam. Got the afterbay there, didn't make any difference. The water isn't really lost, except it doesn't go through the [hydropower] units.

Storey: You were saying earlier, with limestone–will it hold water? Why is that?

Duck: Solutioning. You know, you've heard of all the big limestone caves. Limestone is water soluble. Over a period of time, you really don't know what's connected, or if it's connected to anything.

Anchor Dam Had a Problem with Seepage into Sinkholes

Storey: So you're always concerned about what's going to happen. I think Anchor Dam had a problem with this kind of thing, maybe.

Duck: You brought it up, therefore–yeah, Anchor Dam never held water. Saw it up for sidewalks. They've spent a little money–they spent a lot of money, I think, initially, trying to figure out

whether, you know, you could blanket the reservoir, they've tried a number of different things, but my understanding was, they never did find a water table at Anchor. And some of those things are a little–you know, that's one of the things you look for.

"If there isn't any water table, why, you may have a potential problem—karst limestone. . . ."

If there isn't any water table, why, you may have a potential problem—karstic [karst] limestone.

There is nothing unusual about dealing with limestone ~~karst~~ on a regular basis. You're looking for engineering solutions, and, as an engineer, that's what you do. You solve problems. And so it's an international thing. It isn't restricted to Yellowtail-type projects.

Storey: Once you were promoted to Field Engineer, were you still supervising a shift?

Duck: For the most part, no. You know, you had the other supervisory inspectors that were moved into those positions, and so forth. The day shift thing, for me, was– Phil Soukup had his craft superintendents, his superintendents for the concrete, or excavation, or the powerplant superintendents, and so forth, but he dealt with me a heck of a lot of the time, and then I dealt with his supervisory people. He had his finger or thumb on everything that was going on, knew what was going on. He'd be out there in the middle of the night. It wasn't unusual to see

Phil on the job at three o'clock in the morning. And, you know, my part of it was similar to his. I was out there all the time, and with our people all the time, and getting feedback on what they saw that he may have thought he had the rose-colored glasses on, and I brought him back to earth a few times.

How Duties Changed When Moved from Inspection Supervisor to Field Engineer

Storey: Well, had your role changed between being a supervisor, and being an inspection supervisor, and being field engineer, in terms of the way you worked?

Duck: Yeah, you take over some of the responsibility for the mechanical, electrical, *all* the activities that are going on in the field. And, again, not, you know, that much different, just a different level of responsibility for it. But you're looking at kind of the same thing, but also looking at the planning, the construction planning. Thought it was a lot harder.

As Principal Inspector Your Focus Is the Daily Activity as Opposed to Planning for Future Needs

As principal inspector, you know, you were looking at the activity going on today, and not so much what's next week or next month, and how you get into that with the easiest approach to it.

Storey: What kind of staff would you have had at

Yellowtail?

Duck: As Field Engineer?

Storey: Well, how about how much staff on a shift when you were principal supervisor and then how about–

Duck: It still runs the same from, you know, six or seven on the dam, to three or four in the powerplant, probably, in the tunnel, grouting. Maybe a total of twenty people, something like that.

As Principal Inspector Supervised up to 20 People; as Field Engineer Supervised up to 120 People

Storey: And then when you became Field Engineer?

Duck: Up to 120, or something like that.

Storey: So that was quite a government camp out there, I guess.

Duck: Sure.

Storey: Then there was an Office Engineer with the staff.

Duck: Yes.

Staffing for the Office Engineer

Storey: What kind of staff in there? Do you have any recollection?

Duck: Just off the top of my head, I'd say twenty-five, thirty-engineers, technicians. Depended on what you were developing in the Bureau. A lot of the lift drawings and so forth were done by the Bureau at Flaming Gorge and at Yellowtail, they were done by the contractor, and checked by the Bureau. When you get into that sort of thing, you've still got the same amount of staff about. If you're going to do it, it takes so much. If you're going to check it, it takes so much. But, I would say, you know, the twenty to thirty people in the office engineering group was probably pretty close.

Storey: Did we run into any unusual field problems at Yellowtail, that you recall, other than the springs a half mile downstream?

Duck: You know, that's expected. There wasn't anything unusual about that. We knew we were going to have to deal with it. Yellowtail involved a number of other things, too–railroad relocations, bridges in the upper end of the reservoir, a transmission facility. But, you know, from my perspective, I can't think of anything that was unexpected or that unusual at Yellowtail.

Storey: When did Mr. Granger leave? How long before construction ended does a person like that move on?

Staff Were Watching Libby and the Third Powerhouse to See What Project Would Go Next

Duck: As quick as he can get out of there. (laughter) Well, we were all watching Libby first, how that was going to go, whether it would go Corps or Bureau. But then Coulee came into the picture, the Coulee Third Powerplant, and there were a lot of things that had to fall in place for Coulee to go. The Canadian agreement for power that was provided out of Grand Coulee Third Powerplant, those things were being negotiated. And, of course, the funding, and the decision on what was going to be the size of the units, all these things were going on at that time.

Roscoe Granger Had Been Promised the Third Powerhouse Project When it Was Authorized and Funded

But Roscoe had been assured that when Coulee Third Powerplant, when it was authorized *and* funded–and I can't remember whether it was funded when he moved over there or not, but I would say that he left–let's see. I left Yellowtail in about August of '67, and he had been gone maybe nine months or something like that, prior to my leaving.

Storey: He'd gone over to Grand Coulee to start work there?

Duck: Yes.

Storey: So it had been authorized at that point?

". . . well, it had been authorized, I'm sure. I'm not sure that it had been funded. And there's a

big difference. . . ."

Duck: I'm not sure–well, it had been authorized, I'm sure. I'm not sure that it had been funded. And there's a big difference. You know, there was a Construction Engineer on Yellowtail in 1947.

Storey: There was?

Duck: And Roscoe moved over there in '63.

Storey: A little before you did.

Duck: A little before I did, yeah. But there had been a Construction Engineer selected, on the site, for building Yellowtail, in 1947.

Storey: Well, I know Ken Vernon was real hot to build that when he was Regional Director from '47 to '53. Who was the Regional Director while you guys were building Yellowtail?

Duck: Harold Aldrich was–and Bruce Johnson[8] may have been there. Was Bruce Johnson there when Harold was Assistant?

Harold Aldrich and Bruce Johnson

Storey: Well, we can find out easily enough. [Referring to documentation] Bruce Johnson was '60 to May of '64, then Harold Aldrich until '72.

8. Bruce Johnson was regional director May 1960 and was succeeded by Harold Aldrich in May 1964.

Duck: Okay, that had to be right. I was right in the transition, because I went in there in '64, and Harold assumed responsibility for the Regional Director job.

Storey: Did you have a lot of contact with him?

Duck: I had quite a bit with Harold Aldrich, not Bruce Johnson.

Storey: How would the Regional Director relate to the construction project? How did you relate to him?

Duck: You know, Roscoe–or the Construction Engineer– obviously more. I had, you know, really pretty limited contact with him in relation to anything that I was doing, the work.

Regional Director Responsibilities for Construction Projects

The regional directors *then* were responsible for some administrative services, and getting the project authorization, getting the funding. Those are extremely important functions that were performed by the regions, you know, everything from land acquisition to dealing with the politicians.

For the most part– and I think I can speak for the Roscoe Grangers or *any* of the construction engineers–they may have had an increasing role in it maybe later on, but when we moved into a construction project, that's

what it was all about. Somebody else was taking care of the money, making sure the funding was there, the administrative part of it, relations with Interior, coordination with other agencies, and so forth. We had our part of it, if it was field-related.

Issues with the Bureau of Indian Affairs while building the access road for Yellowtail Dam

Interesting story with Roscoe and the BIA [Bureau of Indian Affairs] at Yellowtail. We were paving the construction access road, really the access road between Hardin, St. Xavier, wherever you want to call it, on the project end of this thing–paving a road out there. BIA pulled a motor grader in and dug it up and pushed it out. It was on their right-of-way. Those kind of things caused a lot of heartburn. That was the relationship between the Bureau and the BIA, at that time–Bureau of Indian Affairs and the Bureau of Reclamation. Didn't get along too well, if you understand my–I forget what it was, half mile or other, something like that. We laid it down, they dug it out. Made a hell of a lot of sense, right?

Storey: Yeah, it did.

Duck: You know, it was like twenty feet of right-of-way or something. Harold Aldrich, when I left–and I'd call it casual contact–of course, we had Dominy–you know, we built that A-frame guest house. That was a big deal at Yellowtail, but it was primarily for Dominy to come out.

And, of course, if Dominy was around, Harold was around. They both were a couple of goddamned characters, just pure and simple. I like both of them. They're both great guys. But, you know, that casual contact, what I'd call casual contact, with Harold.

Harold Aldrich Tried to Convince Him to Stay on as Regional Engineer

But when I was leaving Yellowtail, he *really* tried to persuade me to stay on as regional engineer in Billings. To placate him, I sure as hell didn't want to irritate Harold Aldrich too much, so, you know, I kind of played the game, but I had no intention of ever going to a regional engineer job.

"I was on to the next *big* construction project. That's what I wanted to do. . . ."

I was on to the next *big* construction project. That's what I wanted to do.

Dominy Promised Grand Coulee to Roscoe Granger

Storey: You said earlier that Mr. Granger had been assured that he would have Grand Coulee. Who could give that assurance?

Duck: Floyd Dominy.

Storey: Floyd Dominy?

Duck: Floyd Dominy, yeah.

Storey: Oh, okay. Not the Chief Engineer?

Duck: No. Certainly, the Chief Engineer– you know, Dominy, and Bellport had agreed on that, I think it was Bellport.

Storey: Yeah, I think it would have been at that time.

Duck: Yeah. Dominy and Bellport and Bloodgood, those guys, you know, they were all on the same page. They were all on the same page. Some weren't with Dominy.

Storey: If you think back, were there any particular reasons you didn't want to be the regional engineer in Billings?

"You know, I didn't even consider it [regional engineer] much of a job. The big construction projects were where I was headed. . . ."

Duck: Well, yeah, there's a lot of reasons. You know, I didn't even consider it much of a job. The big construction Projects were where I was headed. And, at that time, there were a lot of them on the board. You know, *not* the Grand Coulee, not the Coulee Third Powerplant, not maybe that scope.

". . . there were a lot of . . . projects that were being thought about, in the planning stage . . . And it looked to me like, you know, there was no end to it. And that's what I wanted to do. . . ."

But there were a lot of other projects that were

being though about, in the planning stage, and so forth. And it looked to me like, you know, there was no end to it. And that's what I wanted to do. I still have the urge every five or six years, looking over the horizon. Where should I be going?

Storey: You mentioned earlier that one of the things that had to be settled was the size of the units in the Third Powerhouse. Do you remember what you were hearing in the field at that time, about the discussions that were going on, about that?

Duck: What I was hearing was that they were going to be the big units. The decision was made. Now, who are we going to drag, kicking and screaming? You know, I had nothing to do with it, whether they were going with the big units. Roscoe had nothing really to do with it. That's so far out of our background to really have anything to say about it. The only thing was that we knew, I knew, and, of course, I'd had the exposure to installing units, and the problems with getting them into commission, starting up, that sort of thing, with not state-of-the-art stuff, the regular, routine, you would consider, units, and so forth.

Obviously, when you start pushing the state of the art, the most of anything, anyplace in the world–and the Bureau did an awful lot of that–conservative, you bet. *The* top engineering organization in the world, come to this sort of–you know, from these water resources projects. I don't give a damn whether it's dams or power or what it was, the Bureau was the

best, and I'll talk about that a little more, a little later. But you know that when you start pushing the state of the art, you're going to have problems. There's going to be *things* that happen that you have to deal with, but that's what we're there for.

". . . you know that when you start pushing the state of the art, you're going to have problems. . . ."

But as far as having anything–as far as I was concerned, when I started hearing, and kept hearing, about going from the twelve units down to six 600- megawatt units, and then it turned out to be three 600s and three seven something. I can't remember exactly what it was.

". . . 600 megawatt, plus turbine generating units, and the scale of everything going up, you know, for that size unit, we were going to have problems of one kind of another . . ."

But anyway, 600 megawatt, plus turbine generating units, and the scale of everything going up, you know, for that size unit, we were going to have problems of one kind of another, and it ain't gonna to be solved in fifteen minutes. It's going to take years to work through.

Storey: But you knew from talks with Mr. Granger that you were going to be over there? Is that what I'm understanding?

Duck: Yeah. Yeah, there was no doubt that that's where I was going.

Storey: And you went, August of '67.

Duck: August of '67.

Storey: What was the stage of construction when you got there, or was there a stage of construction?

The Third Powerhouse Was Being Contracted at the Time of Arrival on the Project

Duck: There really wasn't anything–you know, it was getting under contract.

Preliminary Site Clearing Had Begun, but No Construction Contract Work

There was some preliminary stuff, like getting houses relocated, getting things moved out of the take line, getting prepared, doing the planning for what, at least, *our* perspective, on what the contractor might do, what he might want to use for areas, and getting all that preliminary work done. But there wasn't a construction contract underway then.

"We had the switchyards to move– without taking them out of service . . ."

We had the switchyards to move–without taking them out of service– to rebuild, or build, and then remove existing switchyards. One on the right abutment was in the way of the forebay, for a forebay dam. That had to be

taken out before we could start the forebay construction.

"Had to remove the end of the dam, and there was a significant amount of planning that went into that. . . ."

Had to remove the end of the dam, and there was a significant amount of planning that went into that.

Storey: You talked about blowing it up, I think, last time. Wasn't it you?

Duck: Well, I think I was talking about–

Storey: Tunneling, maybe.

Duck: Maybe somebody else mentioned blowing it up, but we were driving under the switchyard relocation and the switchyard construction work.

Drove a Tunnel Through the Dam to Provide Cable Access to the New Switchyard

There needed to be cable access driven within the dam, and a tunnel, an incline tunnel for cableways to that new switchyard. Big switchyard, big structure.

Laying Oil-insulated Cable up a Substantial Change of Elevation to the New Switchyard Had Not Been Done Before

Everything was scaled up kind of, there at

Coulee, and pushing again the state of the art for the type of oil pipe, the insulated cable, high-voltage cable systems that hadn't been done. Lay them out horizontal, that's one thing. That change in elevation there at Coulee was something else. That hadn't been done before.

Storey: I understand those stretched.

Duck: Creep down, you know–

Storey: And they had problems.

Duck: Cycle, and it keeps creeping down the hill, and so forth. Ultimately replaced them again.

"Again, those kind of things. Designers think they've got it figured out, and you go build them, and then you modify them if it doesn't work. Nothing unusual about it, as far as I'm concerned. . . ."

Again, those kind of things. Designers think they've got it figured out, and you go build them, and then you modify them if it doesn't work. Nothing unusual about it, as far as I'm concerned.

Storey: Is that typical of engineering?

Duck: Oh, I think so.

Storey: You know, one of my favorite questions is–well, you know, I'm just a historian–engineers are supposed to do it right the first time.

Duck: And you fully expect to. You fully expect to. It doesn't always work.

Storey: Doesn't always work.

Duck: Doesn't always work.

Storey: Last time you mentioned some of the coordination problems with the office there at Grand Coulee.

Duck: Yeah, that started out pretty shaky. Ultimately got worked out. Everybody keyed up. As a matter of fact, I believe when they awarded the prime contract for Grand Coulee Third Powerplant, it was $110 million, I believe that was the largest civil works contract that had been awarded by the government up to that point in time.[9]

Third Powerhouse at Grand Coulee Was a Joint Venture of Vinnell, Dravo, Lockheed, and Mannix

And that, again, was a joint venture–Vinnell, Dravo, Lockheed, and Mannix,[10] Mannix being the Canadian contractor, and they had about 10

9. Others have stated that it was the largest Reclamation contract up to that time.

10. Vinnell Corporation of Alhambra, California; Dravo Corporation of Pittsburgh, Pennsylvania; Lockheed Shipbuilding and Construction Company of Seattle; and Mannix Construction Company of Calgary, Alberta, Canada.

percent of the project. The rest of it was split amongst the other three. Interesting to note that not one of the three–I'm not sure what the status of Mannix is–is in the heavy construction business today. But at that point in time, that, I think, the largest civil works construction project that had been awarded, and sponsored by Vinnell.

Storey: How do you spell that last one?

Duck: V-I-N-N-E-L-L, I believe. Vinnell.

Storey: How did that work?

". . . Vinnell, went through, if I'm not mistaken, three managers in less than a year . . "

Duck: Coulee was another one of those projects post my view of how Yellowtail was. Grand Coulee, sponsored by Vinnell, went through, if I'm not mistaken, three managers in less than a year, were *into* the third manager in less than a year.

"Everything got behind real quick. . . ."

Everything got behind real quick. We thought that they selected the wrong support system, using whirly cranes with a materials deck. In between there were three decks. Once the decision is made, and this is what you build, for supporting the project or accomplishing the project–

END SIDE 1, TAPE 2. FEBRUARY 12, 1996.
BEGIN SIDE 2, TAPE 2. FEBRUARY 12, 1996.

Storey: You were talking about the fact that their support facilities might have been ill-chosen.

Duck: Jumping ahead, the project got behind schedule. Actually, this is going back quite a few years, but Ellis Armstrong, Commissioner at that point in time, came out.

Serious Problems Because of Political Commitments for Completion of the Project

You know, there was an administration/ departmental commitment that this facility was going on the line on X date, and nothing is going to change that. Well, from day one, I knew, and Roscoe knew, that we were dead if we didn't–you know, everything had to go just like clockwork, and we never saw a project go like clockwork.

Anyway, a year into the project, or thereabouts, and according to what I was saying, at that time, and I was Roscoe's Field Engineer, he didn't really rely on Howard Fink, anybody else. It was me. He was relying on me the whole way to keep him out of trouble. Well, what I had decided, we were losing a day every day we were~~n't~~ working on the job. That was my conclusion. Every day that this contractor, these people, are working on this project, we're a day behind, and that takes some doing to get there. And, again, the politics got involved in it, and, you know, I didn't give a

damn about the politics. What I cared about was what was going to come down on our head.

So Ellis Armstrong came out, and Ellis and I traveled the project together. We're standing on the top of the existing Grand Coulee Dam, looking at construction, and I'll never forget it. I said, "Ellis, we're a year behind, and we're getting farther behind every day. A year behind. And from where I sit, you know, there's no way we're going to make it up, no way that we're not going to lose another year."

He reached over, patted me on the shoulder, and he says, "You'll figure out a way to make it up." And, of course, I didn't say any more to Ellis, but went back, talked Roscoe into signing a letter to Bellport, telling him that we were a year behind, not only a year behind, but it didn't look good for not losing another year.

Well, I think what happened, and I don't know this for certain, but I think Roscoe told it to me pretty straight, Bellport got the letter, called up Armstrong, told him what the letter said, and the letter went in the wastebasket, you know, weren't going to acknowledge to anybody that that project was slipping.

Well, in addition to everything, a hell of lot of things going on, 50 million yards of excavation, and cutting the end of that dam, and getting it all done without killing a lot of people. We *finally* got to the point where–and I can't remember how it reached this point, at any

rate, we finally sent a cure notice to the contractor, "Tell us how you're going to fix it." And this had to be worked through, and time had gone by. A significant amount of time had gone by before we could push it to this point.

Cure Notice Sent to Contractor

Anyway, sent a notice to the contractor to tell us how we had it sized up, how they expected to cure the problem, or that we were placing them in default.

Well, that resulted in a series of meetings between the field, the Denver office, and, at that time, I got to be the–as I told those contractors, that whole group, and we had them all, sitting up here in what was called the Brown Room, at that time, on the fourteenth floor. It was a hell of a bunch of people, had the lawyers, everybody's lawyer. I made a presentation, and laid out just exactly the way *I* saw it, what had happened, and where we were, and what it was going to take. One, I had it laid out from what it would have taken from the day they moved in on the job to have stayed on schedule.

There was a lot of discussion at that time about critical path. We had included a critical path analysis in the specifications, and that was kind of on the front edge of–although not completely on the front edge of that technology, but planning technology. But what it was going to take to get it back on track. The contractor alleged that they were using the critical path.

Contractor Was Using Two Rather than Three Shifts

Well, they were using the critical path on a two-shift basis. They weren't even including the three shifts, and I knew that, right or wrong.

We pushed them right to the edge of–we had them convinced we were going to place that group of contractors, given their reputation at that point in time, which wouldn't mean anything now, they're nonexistent now, but Dravo and Mannix, Lockheed was, you know, just there. They were having their shipbuilding problems. Doug Baker was working for Lockheed at this time. Doug had gone from Project Manager at Flaming Gorge, he went to M-K from Kiewit. So I had him out of Boise on Yellowtail. He was now with Lockheed on Grand Coulee. So, you know, I kept seeing Doug Baker. But as I say, Mannix was a skookum outfit at that time– Canadian. Pretty good people, pretty straight. They didn't want this on their record, that they had been in default on that project.

". . . a good part of them came from the West Coast. They called a lunch recess at ten o'clock in the morning, Denver time. . . ."

And Dravo sure as hell didn't want their reputation [injured]– anyway, they called a lunch recess, and a good part of them came from the West Coast. They called a lunch recess at ten o'clock in the morning, Denver time.

Sponsorship Shifted from Vinnell to Dravo

What they came back with or what ultimately we got was a change in sponsorship. Dravo took over the sponsorship–

Storey: From Mannix?

Duck: From Vinnell, who had had three managers on that project in a short period of time. Dravo agreed–their proposal was, as part of their cure for the problem, was to bring Dravo in as sponsor and put their own Project Manager in, which was project [manager] number either four or five, that we'd had at that point in time, when Ellis was telling me, "No, you figure out a way to make it up."

Dravo brought a guy in by the name of John Heckert to manage the project, and from then on, John was struggling to maintain no worse than where they were, which was a difficult thing to do. John and I got along great. John and Roscoe got along great. These other guys were flakes. One of them that Vinnell brought in didn't stay two weeks, and he had come off of one of the other–not John Day, but one of the other Corps dams. The last manager that they had was a crazy son of a bitch that they brought in from John Day. His company car was a brand new Ford Thunderbird. (laughter)

Storey: These were projects further on down the Columbia that they were drawing upon?

Duck: Yeah.

Storey: So Vinnell had experience with these?

Decline of the Heavy Construction Industry

Duck: Vinnell had a lot of experience with it. It is symptomatic of what I see happening, and has happened, and *was* happening to the construction industry, to the major construction contractors. You know, old man Vinnell, he had a guy with him that I don't remember his name, but when Vinnell died and he handed the management of that company to his successor, everything went all right. When his successor passed out of the picture–I think he also died just within a couple of years–if I remember right, the CEO was an accountant, and when they passed out of that whole history, that lineage of construction people and major projects, and give it to someone that's looking simply at the dollars and cents, and don't even know enough about the business to tell when somebody's lying to them, they begin to fall apart. That happened in a heck of a hurry to Vinnell.

Doug Baker, again, worked some years with Vinnell, and I can't tell you, I just haven't had enough interest to look back at where and when Doug was with Vinnell, but he was with them quite a while, but left, I'm sure, at the time that the old man died.

But if you look at Atkinson, M-K, and look at what has happened to these major

players, look at the six companies that built Hoover Dam, the only one that really is still out there, in name, doing the same thing–I'm not sure there is any. I was going to say Bechtel, but Bechtel is not in the construction business anymore. The *company* is there, and they are involved in a lot of different things, but Bechtel Construction, as, you know, Steve Bechtel, in their involvement with Hoover Dam, Atkinson's involvement with Hoover Dam, of course, Atkinson lost their heavy construction people. The last CEO of Atkinson that I knew well came out of the manufacturing group in Minnesota.

You can just go through the [list]–Utah, I don't know where they are today. Look at Kaiser. Doug Baker was with Kaiser down in Guri, in South America. And I, later on, had him down there, with Harza. The major construction players are few and far between. The oldtimers are gone.

Storey: Did you make up the time?

Duck: No. I forget how late we were. Would have to go back and look. Of course, I wasn't there, you know, when it all shook out. And that's another story, too.

Storey: One which we'd best not start today. (laughter)

Duck: Whatever you say.

Storey: Were you involved when they did remove the end of the dam and everything? Why don't you

tell me about that. Or is there something before that we should talk about?

Duck: I don't think so. I don't think the sequence makes much difference.

Storey: You've talked about moving the switchyard, and that kind of thing.

Howard Latham Became Reclamation's Safety Officer

Duck: That was a major effort in itself. One of the things, for safety reasons–and at this point in time, Howard Latham was the Chief Safety Officer. Barney Bellport had brought him into Denver. He backed Howard Latham. We'd all scream and rant and rave and cuss, but if Howard said that was the way it was going to be, old Barney backed him. And Roscoe was smart enough not to take him on, anyway. But that was the beginning of– and going back to Flaming Gorge, that was where that safety program really got started.

Storey: You were talking about Howard Latham starting a safety program. Is that what I was hearing?

Howard Latham Affected the Construction Program for the Third Powerhouse

Duck: Yeah, *seriously* getting a safety program initiated. Howard was obnoxious as they come, but if he wrote you up, Barney was going to

come down on your head. There wasn't any arguing with Latham. Well, how that relates to Coulee is, Howard, because of all the extraneous electricity, all the transmission lines, all the proximity of the switchyards and so forth, *mandated* that all the blasting be done with non-electric delays. That meant you couldn't even use a single cap to initiate a system. Everything had to be primacord, prima dets, cut fuses, caps. Everything was non-electric, which made it a little bit unusual, but that's the way it was. We didn't use an electric blasting cap on that job.

The specifications required taking down the concrete in the dam in five foot lifts

But the specifications required that those last four or five blocks–and the fifth would have been just a wedge-shaped piece of concrete, next to the abutment–that they all be taken down, or that the blocks be taken down in, like, five-foot lifts. Very limited amount of blasting powder and so forth per blast. Everything monitored for vibration. Maximum accelerations specified and so forth. And, you know, that's a long, arduous process, and you're still blasting on the dam.

". . . they proposed that we just knock the rock out from under . . . those blocks, and tip them into the forebay area. . . ."

Contractor approached me–well, the

contractor I might have mentioned early on, Bill Grimes, who was what *I* considered to be, without the education, without anything, a real blasting expert. He was a technician, but he'd been around. That's what he'd been doing for years and years and years. Well, they approached me with the proposal that we shoot the rock out from under the–the base of the blocks were exposed, the work area was protected by a set of cellular coffer dams, retaining the reservoir. Cellular coffer dam built around these blocks that were to be removed, and they proposed that we just knock the rock out from under the bottom of those blocks, and tip them into the forebay area.

Looking at it and thinking about it, I decided it could be done, and we set about to do it that way. That end block wasn't that significant, but there were two full blocks and a piece of a block that were, you know, they were up there in the air 50, 75 feet. Anyway, what we set out to do was just drill under them and kick the wedge-shaped piece out from under them, roll the whole section into the forebay. And then without affecting the main structure, you could drill them secondary blast, shoot them into sizes, you know, pieces that could be handled. And that's what we did. It was spectacular.

I got myself in, again–I was always into some kind of debacle, but the region got word of what we were going to do, and got all prepared to send photographers out. We had a project photographer and all. Going to send

people out to watch, from the region. Roscoe called me in and asked me about it, and I said, "If they come out, we don't do it. We aren't going to do it with a lot of spectators."

". . . I have a hell of a lot of confidence, but I had a hell of a lot more confidence then than I do today. . . ."

You know, I have a hell of a lot of confidence, but I had a hell of a lot more confidence then than I do today. (laughter) The older you get, the more conservative.

But everything went off without a hitch. The picture of the largest block that we rolled out of there was on the cover of *Civil Engineering* magazine. That's the one you see around the Bureau. It may be gone now. I don't know. Yeah, it got done. And it didn't get done without a lot of spectators. There's just no way that you can keep that quiet. The last piece of a block, cut a slot in, an isolation slot, first, and had all that done, from the crest, right down to the rock foundation, so that these pieces that we were rolling off were separated. I forget whether it was a ten-foot slot or something like that, but the end was isolated.

Storey: Well, I'd like to continue on, but we're a few minutes overtime, actually. So I'd like to ask if you're willing for the information on these cassettes, and the resulting transcripts, to be used by researchers.

Duck: Sure.

Storey: Good. Thank you very much.

Duck: You bet.

END SIDE 2, TAPE 2. FEBRUARY 12, 1996.
BEGIN SIDE 1, TAPE 1. FEBRUARY 20, 1996.

Storey: This is Brit Storey, Senior Historian of the Bureau of Reclamation, interviewing Donald [Don] J. Duck, on February the 20th, 1996, at about nine in the morning, in Building 67, on the Denver Federal Center. This is tape one.

Viewed the Third Powerhouse as a Straight-forward Heavy Construction Job

Mr. Duck, last time, we were talking about your work at Third Powerhouse in Grand Coulee, and you had already talked about toppling the segment of the dam and that kind of thing, but we hadn't done some of the preliminary stuff, like putting in the coffer dam, I think it's called, and the kinds of things you had to watch for when you were dealing with an existing dam there. Could you talk about those for me, please?

Duck: It, from my perspective, seemed to be a straight-forward heavy construction job. The cellular coffer dam, of course, that involves underwater work. The downstream coffer dam, add the excavation for the foundation of that coffer dam required underground work. And that material, the clay, extremely tough to dig. Tried a lot of different methods. For the most part, cleaned it up with drag lines, which is not the best, but we

managed to get a foundation constructed. Of course, the upstream coffer dam required underwater blasting. But, there wasn't anything really unusual about the difficulty of the work. That's what we do.

Storey: What about removing the end of the dam and then building the new segment there? What kinds of things had to be watched out for, taken care of, if you will?

Duck: Well, the specifications required–in talking about removing the end of the dam, an isolation slot between the dam that was to remain, and that that was to be removed. A slot was cut from the crest of the dam to the rock foundation, and then the intent was to, in small blasts, five-foot lifts, remove the remainder of the existing dam. In the interest of speeding the whole process up and not having to do that more or less, meticulous, careful blasting, just remove the blocks as a unit.

Then with secondary blasting, down in the forebay, bust up the large pieces into smaller pieces and haul them out.

Storey: Well, you make it sound so simple. They cut a slot from the crest to the bedrock. How did they do that?

Duck: Drilled close center holes, small charges, everything monitored with accelerometers, so that we had control, knew the vibration that was acceptable, and what we were getting, actually. I guess *one* of the things that–couple of things

that were of interest, would be of interest, that we learned about, with the units running in the right powerplant, when these major blasts for excavation in the forebay–and they were large shots; I don't remember how many ton of powder we were using in the blast, but they were big–brought a lot of rock excavation to be accomplished there.

Had to Shut down Some Units in the Powerplants Before Blasting

While the vibrations recorded in the powerplant were acceptable, they were magnified through the rotating parts of the units, therefore we'd trip numbers of the units off line when we'd blast. Therefore, the procedure was developed that we'd shut those units down before we blasted, or you trip them out. The blasting of the cableway tunnels within the dam, of course, there are a number of elevators in that dam. I don't remember exactly how many.

". . . the first blast in the interior of the dam for these tunnels that were being driven, we blew the elevator doors off, and they went clear to the pit. . . ."

But anyway, the first blast in the interior of the dam for these tunnels that were being driven, we blew the elevator doors off, and they went clear to the pit. So we modified. The thing that worked, we tried baffles, still knocked the elevator doors off. The procedure that was developed was to open the elevator doors and

take the car to the bottom, block the elevator doors, and therefore that concussion was acceptable.

Storey: That's interesting.

Duck: Yeah, it was interesting the first time around. (laughter)

Storey: I was down at Hoover last week, touring, and they were talking about having trouble with putting in that new access tunnel for the new elevators, because they didn't want to imbalance the generators, and now I'm beginning to understand. So there's a mechanism in there, in effect, that tells it, "Hey, you're unbalanced, and you've got to quit going around." A governor of some sort?

Duck: Trip it out, yeah. Trip the units out of service. They have the limits in which they'll operate, and if they get a vibration, ~~or a disk,~~ you know, something that's out of the acceptable range, they shut down.

Storey: Something that is out of the acceptable range, yeah.

Duck: Yeah, right, yeah. They shut down.

Storey: How long were you there?

Duck: From August of 1967 until August of 1972.

Storey: So this was your longest construction job, I'm thinking.

Duck: Yes.

Storey: How close to complete were you at that time?

The Civil Works Were near Completion When He Left, but the Units Still Had to Be Installed in the Third Powerhouse

Duck: Not that close. The civil works were near completion, and unit installation under way, switchyards relocated. But even at that point, with the unit installation, that's a major part. Well, that's the purpose of the whole thing, you know, is to have these units that produce electricity. That's what it boiled down to there. Really wasn't any irrigation component or flood control component, really. It was strictly a power project.

There was still work being done on the forebay dam, still work being done on the powerhouse. I can't remember exactly where we were, without going back and looking.

"I left there kind of unexpectedly, as far as I was concerned. . . ."

I left there kind of unexpectedly, as far as I was concerned. Talking a little bit earlier about the training, and, as I recall–

Storey: Before we turned on the tape, yeah. Go ahead.

Duck: Before we turned on the tape, yeah. Ed Sullivan, at some point in time, became regional director, out of Boise. At any rate, he–

Storey: Ed Sullivan was director from ‘72 to ‘74.

Ed Sullivan, the Regional Director in Boise, Talked to Him about Career Goals

Duck: Yeah. So toward the end of–well, he must have come in just before I left there. But he came out and talked to me for–I can’t remember what the reason was and who else he might have been talking to, but I remember him talking to me about what my career goals were. At that point in time, I said, “My goal is to make tomorrow.” I said, “If you’re asking me do I have aspirations to become a Chief Engineer of the Bureau of Reclamation, the answer is no. I expect to be a construction engineer, and I expect to wind up where I wind up. As far as goal setting, no, I haven’t set any goals.”

Well, in June of–and, you know–there were other things going on in the Bureau. Bellport was leaving.

Chief Engineer’s Title Changed When Ellis Armstrong Became Commissioner

Arthur, who was his assistant, was expected, maybe, to assume the so-called Chief Engineer role, although they changed the title at that point in time to Director of Design and Construction, I think. When Ellis Armstrong became Commissioner, that change in titles for the Chief Engineer took place.

Asked to Attend an Engineering Conference at Asilomar in Pacific Grove, California

But in June of ‘72, Ralph Gullett, who headed up the Construction Division here in Denver, called me, and for some reason wanted me to attend an engineering conference at the Asilomar Conference Ground out in Pacific Grove, California, which I did. I think what had happened, somebody had to cancel out, and Ralph wanted me to attend in whoever was supposed to be there, in their stead. I don’t know whether you know anything about the Asilomar Conference Grounds or not.

Storey: No. I just know they’re there, and that they’re supposed to be very nice.

Duck: They are that. No telephones, no TV, no radio, unless you bring a radio, that sort of thing. I didn’t find a telephone on the conference grounds. In other words, if you wanted to call out, you had to leave the conference grounds, go to a pay phone on a side street some place.

Called by Assistant Commissioner Bill Keating and Asked to Fly to Washington, D.C.

But while I was there, I got a call from Bill Keating, who was the Assistant Commissioner under Armstrong at that time. The way it worked is, I got the incoming call, or they took the incoming call on the conference grounds, but I couldn’t return it from the conference grounds. Anyway, I had a call that Bill Keating wanted to talk to me *as soon as possible*. You had to know Keating. He was another character.

Told He Was Being Considered for the Position of Deputy Director of Design and Construction

Anyway, I found a pay telephone off on one of the side streets of the Asilomar grounds, and I got hold of Keating, and he said, "Duck, I got a hell of a shock for you. You're being considered for the Deputy Director of Design and Construction, and I want you in Washington, like tomorrow, like now."

And I said, "Hell, how am I going to get out of here? Are you going to make hotel reservations, etc., etc.?" Anyway, I changed my plans right quick. I think it was the next day, anyway, I had a chance to walk around on the beach at the campground, and think about what the hell, you know, and my conclusion was that I was just one on a list of candidates that were being considered, and I was about half-irritated that I was going to be jerked back to Washington, D.C., all for nothing. I don't give a damn about it anyway. But the ego thing gets into it, too. It was an interesting feeling.

At that point in my career, I was, what, forty-one years old. Yeah. That I was being considered for that job–anyway, I went back to D.C., and the Assistant Commissioners, Don Anderson, Keating, as kind of a curious thing to me, were treating me like it was a done deal. I kept saying, "Who in the hell else are they looking at? Who's on the short list?" Couldn't get anything. You know, they were just treating it like it was a–which it could be, at that point in time.

Later on, the–it wouldn't have been possible to just reach in and pick somebody without competing it, without some appearance of a competition going on. Today, it couldn't be done, I'm sure. But nevertheless–and on the way back from Washington, I had another meeting that I'd been scheduled for for a long time, and this would've been the early part of August, with the underground construction group, and I presented a paper on the blasting that we'd been doing, the non-electric blasting, that whole excavation blasting program at Grand Coulee.

Storey: Where was this you gave the paper?

Duck: In Chicago, Palmer House. Underground construction. U.S. Tunneling and Technology was the group that had asked me to present this paper.

Arthur Asked Him When He Would Be Able to Move to Denver

Anyway, Harold [Arthur] came through there, too, and, of course, I don't remember exactly what he said, but, you know, when can I move? It was a done deal. And that's what Armstrong told me before I left Washington, as well. The only thing he'd cautioned me about was that this certainly didn't mean that I was going to become Chief Engineer. It would be decided at that time, which I thought, "Well, it makes sense, you know.

Storey: But it's not the tradition of Reclamation. The

Assistant, I believe, had *always* become the Chief Engineer.

Duck: Yeah, yeah. (laughter)

Storey: Ellis told me he was trying to change the way the Denver office functioned, so he was thinking differently, I think.

Duck: He did. There are some pluses and minuses that go along with that. You know, I agree that–but on balance, I don't think it worked that bad.

Storey: The former system, you mean?

Ellis Armstrong Disrupted the Denver Office with His Shake up

Duck: The former system. There was a hell of a lot of disruption that occurred, you know, that was created by Ellis, and the shaking up of the Denver office. You look at things the way they shook out, the way they happened. Part of what–the Teton [Dam] thing, you keep coming back, or those of us that lived through it, you keep coming back to Teton, and the significance of that on the Bureau program. But, you know, in flying around with a bunch of congressional subcommittee staffers at some point in time after Teton failed, when "Bizz" Johnson[11] and

11. Harold Terry (Bizz) Johnson served as president of the American River Development League from 1945 to 1949; member of the California state senate 1949-

(continued...)

[Manuel] Lujan,[12] [Donald Holst] Clausen,[13] California; [Steven D.] Symms[14] from Idaho; Hansen, Idaho, when those people and the related subcommittees and their staff people–I accompanied them on the airplane up there to look at the site after it failed, which was kind of a devastating thing, even today, to go look at it. It was a hell of a thing.

Anyway, we spent the time on the project, and then spent the evening in the motel, up until the wee hours of the morning–one-, two o'clock–and they grilled the hell out of me. I can't remember the staffers that were there. They concluded, when we broke up, that I had convinced that particular group of people that Teton should be rebuilt. And I believed that. I believe it today.

11. (...continued)
1959; member of the U.S. Congress 1959-1981; not reelected in 1980; and died in Roseville, California in 1988.
12. Manuel Lujan, Jr., born in 1928, served New Mexico in the U.S. Congress 1969-1989; Secretary of the Interior 1989-1993; is a resident of Albuquerque.
13. Was a California representative to the U.S. Congress 1963-1983, not reelected in 1982. Subsequently served as director, special programs, Federal Aviation Administration.
14. Born in 1938, Symms served in the U.S. Congress 1973-1981 and than in the U.S. Senate 1981-1993. Subsequently stayed in Washington, D.C., in various lobbying capacities.

". . . dealing with those people is a high-risk exposure *anytime* . . ."

". . . it was my feeling that, really, the Bureau got to the point where its confidence level reached an over-confidence in whatever we were doing . . ."

But what I said, what I believed, and said it to that group of people, dealing with those people is a high-risk exposure *anytime*, but I told them it was my feeling that, really, the Bureau got to the point where its confidence level reached an overconfidence in whatever we were doing, that we had that confidence level in what we were doing, what we were engineering, what we were building, that we got over-confident. You can always look back on a disaster like that and make some kind of a conclusion like that. But the experience, the fact that you had 300 dams, 300-plus dams sitting out there, and not really had a failure, Fontenelle, you know, that was another near-disaster.

Fontenelle Was a Near-disaster

Felt Barney Bellport Should Have Highlighted Fontanelle Dam Problems to Staff

I was always kind of irritated, really, at Barney Bellport for not *really* making that experience–not ramming it down everybody in the field's throat, you know, making everybody look at what nearly happened at Fontenelle, but for, really, the type of material and the size of

the ability to empty the reservoir was what made the difference there.

Teton design didn't require large outlets

But you come along with the Teton, and didn't require the large outlets, dealing with erodible materials, all of the above. I knew about Fontanelle–I was at Yellowtail at the time–but didn't register. You know, nobody really briefed us on what was going on. I really feel like everybody in the Bureau that dealt in the field construction process probably should have watched the Fontanelle movie and then had drilled into them what the potentials are for dealing with these hydraulic structures.

My experience in concrete dams, you know, we had the little embankment dam, the afterbay dam, at Yellowtail. But really, my experience with concrete don't have the same kind of concerns about earth materials [as] with concrete.

Storey: That you do with concrete dams.

Duck: Yeah, well, you deal with embankment, embankments being earthfill, rockfill, central-core, whatever.

"All of the studies that were done, the effort that was put into what exactly happened at Teton, nobody knows yet today. Everybody has their ideas, but it simply isn't possible to tie down exactly what the hell happened there. . . ."

All of the studies that were done, the effort that was put into what exactly happened at Teton, nobody knows yet today. Everybody has their ideas, but it simply isn't possible to tie down exactly what the hell happened there. We know it failed. That was my conclusion right out of the–doesn't really make that much difference, the exact mechanism that it failed under. It shouldn't.

Storey: Where were you when it failed? Do you remember?

Duck: Yeah. Hell, yes, I remember. Getting ahead a little bit. Well, I came in to Denver in '72.

Storey: Do you want to go back and start there? That's fine.

Duck: I'll get back to Teton pretty quick, because it comes up pretty quick. When I saw Arthur in Chicago, and he told me that I was his candidate, and get ready to move, I went back to Grand Coulee and made arrangements to move to Denver.

Was at His Daughter's High School Graduation When Teton Dam Failed

You were asking about where I was. Our daughter graduated from Columbine High School in 1976, and in June of '76, on June the 6th, she was over here across the street in this Jefferson County complex. That's where the graduation ceremony was.

Storey: The sports stadium.

Duck: Yeah, right across the street. Right across Kipling. We were over there. She graduated. It was like ten o'clock in the morning. Teton was already under–it was distressed at that point in time. At least the abutments were leaking, and so forth. Sat there through her graduation ceremony. She went off with her friends, and Dolores and I went over there to the Lakewood Grill. I don't know whether you know where the Lakewood Grill is or not.

Storey: I'm not sure where that is.

Duck: And had lunch. Well, it's over on Colfax. It's a hole-in-the-wall place. She came into Denver with me from, I guess, Flaming Gorge and from Yellowtail, to concrete school and to earth school. We stayed over there on Colfax, around one of the motels over there. So we got familiar with this Lakewood Grill. Anyway, we went *back* to the Lakewood Grill for lunch after this ceremony, or the graduation ceremony, and got home about four o'clock in the afternoon.

When I walked through the door, the telephone was ringing, and Bill Groseclose was on the phone. He said, "Have you been watching any TV? There's a dam failure up in Idaho. Turn on the TV and tell me if that's our Teton Dam."

I punched the TV on, and I said, "It sure as hell is."

When Teton Dam Failed, Harold Arthur Had Recently Lost His Wife

Arthur had been trying to get hold of me, and so I called Harold right quick. Harold had gone through total hell up to that point in time. I think his wife, Fran, was diagnosed with a brain tumor in December–December of '75, January of '76, about that time. Of course, she went downhill in a hurry, and passed away in April–I believe it was April–of '76. He was pretty shook up about that. While it didn't drag out for that many months, it was tough on him. It was tough on all of us. He spent a lot of time in my office, every morning, talking about Fran. He was really torn up. They got along great. They were a great couple, and great friends of Dolores and mine. Tore us all up. Anyway, he'd gone through that, certainly hadn't recovered. He took some time off and drove around. He was out in California a while and up in Montana.

END SIDE 1, TAPE 1. FEBRUARY 20, 1996.
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Storey: You were saying that after his wife's death, Harold had taken a few months off, and then I guess he was back.

Duck: Yeah. He was back. Then when I got hold of him, we agreed that he would–I didn't know where the airplanes were, but I knew we could get one within a matter of hours. Anyway, we agreed he'd take a team of engineers, geologists, engineers, go to the site and start

battening down the hatches, getting ready to answer a *lot* of questions about a lot of different things, and that's where it went.

". . . his time was *all* spent on the Teton failure activities . . ."

". . . my time was spent trying to run what was left of the Denver office, as well as dealing with some of the Teton-related matters that were being done here in Denver, dealing with the media . . ."

From about that point in time, his time was *all* spent on the Teton failure activities, with the various review groups that were put together, and my time was spent trying to run what was left of the Denver office, as well as dealing with some of the Teton-related matters that were being done here in Denver, dealing with the media and all the ramifications that go along with that.

"We immediately set up a Teton room record group, and tried to gather up every piece of paper that was related to Teton in any way . . ."

We immediately set up a Teton room record group, and tried to gather up every piece of paper that was related to Teton in any way, get it into a single place, and have it available for the media to scrutinize, whatever, and anybody else that had an interest in pursuing it, for whatever purpose. Had the *L.A. Times*, a couple of investigative reporters from the *Times* there, I don't know, a couple of weeks,

something like that. *St. Louis Post Dispatch*, *Time*, *Newsweek*, as I recall.

"You know, we still had projects under construction and projects on the drawing board, and all of those things. . . ."

You know, we still had projects under construction and projects on the drawing board, and all of those things.

Harold Arthur Wanted Someone from the Construction Side of Reclamation in His Office in Denver

Anyway, it was a fun four years, almost four years. I came in to Denver in August '72. Got along great with Harold Arthur. He wanted, or he told me that he wanted somebody from the construction side of the house in that position with him. His background, really, was design, and he felt like he wanted somebody with a construction background as an assistant. Harold's about as articulate an individual–he's as smart as anybody I ever knew. Interesting combination. Interesting to work for him. But I enjoyed it. It was a good four years. That, in itself, was a change, to pick me out of that construction group and bring me into this Denver office.

Storey: Did you figure out why that happened?

Duck: Well, it was Harold's choice, although a hell of a bunch of people must have agreed with him. I think that Bill Keating and Ellis Armstrong–I

think that they felt like his, Harold's, natural choice was going to be Jack Hilf. Buddies for years. Embankment design. Did an awful lot of traveling together. And I'm not sure but what they weren't so goddamned shocked by his choice, that they were speechless. (laughter) I think that they thought that he ought to go a different direction, that someone from the Denver office–and I think Harold outsmarted them.

I didn't think that Harold Arthur knew me that well. I certainly didn't know him that well. He was Barney's assistant. He was there when I came in from the field. He was involved in some meetings, if we had contractual problems with construction or the contractors and so forth. Harold was around, but he wasn't that visible, not with Barney there. Barney ran the show. I never did ask Harold or talk to him about it. But he told me in Chicago, he said, "You were my first choice all along." Never sorted that out, how he put it together, because we really didn't have that much exposure. I'm sure that Barney had something to do with it. I'm sure that Roscoe [Granger] had something to do with it, if anybody asked me. I'm not sure Harold asked anybody.

Storey: And what did he want you to do? What did the deputy do at that time?

Duck: Shared in everything that the director did. Shared responsibility.

Storey: He didn't say, "I want you to take care of this

field"?

Duck: No. Exposed to the whole thing. The way it shook out was that for the most part, I dealt with the construction problems, and there's always something to be dealt with. You know, the amount of construction activity that was going on in the Bureau at that time, potential for problems of one kind of another, either construction or contractual problems. I acted for him when he was out of the office, and he was out of the office a hell of a lot. He did a lot of traveling. So there was never that division really made. It shook out naturally that way. I certainly didn't get into the design-related activities, although I had the responsibility for all of that.

Dealt Mostly with Construction Problems

Storey: While you were out on construction, I'm sure that you had a vision of what the Denver office was and how you should relate to it. How did that affect you in going into that job?

Duck: Well, I'm not sure that I had that personal impression of what the Denver office was. Others did. I heard some interesting things out of other people about the Denver office. But I'm sure a part of that was related to the relationship between Granger and Bellport, Granger and Bloodgood. I never really formed the opinion. I never had an opinion about the Denver office. People from the Denver office dealt with us in a way that, you know, I always looked at it as, "They're coming to help us," if

they were coming to the field.

The Ralph Gulletts. Gullett, for some reason, took a liking to me at Yellowtail. He visited Yellowtail because of the reduction in the size of the dam and the thickness of the dam, and there was already a contract awarded, and there was going to be some adjustment made for the reduced quantities of concrete that the contractor was going to have, and so forth. Ralph Gullett headed up the Construction Division under Bloodgood, and, later, Bellport. Barney had an assistant guy in design, by the name of Bill Wolf, and Bill Wolf, a designer, and, I think, powerplants.

Bill Wolf came out to see me at Yellowtail. You know, I'd been through Flaming Gorge and on into Yellowtail, and we were finishing up Yellowtail, and he wanted me to put together the criticism of the design. You know, Barney sent him out–or Bloodgood. I guess it was Barney. Anyway, sent him out, and he asked me to put together the book on what should be done differently, as far as design is concerned, and the full gamut–concrete, earth, excavation, mechanical, electrical, grouting, whatever–which I did, with a great deal of enthusiasm. You know, you always have your ideas about what the designers are doing.

Then he called me in to Denver with him, and sat me down with each of the design groups to go over the critique of that project which I'm sure a lot of people in the field didn't get that

opportunity, and why it came to me, I'm not that sure. But nevertheless, it was a practice that kind of got, I wouldn't say formalized, but got carried on through for a lot of years, calling the construction engineers in to talk to the designers about what might be improved and so forth.

But I didn't have a negative or neither opinion, really, of the Denver office. The laboratories were a significant part of a lot of what went on, and a significant part of the advancement in concrete technology and so forth. Great group, and a great engineering group. Had a hell a lot of respect for the people. But I got exposed to–and maybe treated differently–I don't know. I'd say that the Denver office really treated me well when I came in here, too. You can imagine that here's this construction-type outsider sitting in that office.

The Chain of Command Was Formal in Denver

Oh, they tested me a time or two, but it was the way things were done in here that kind of amused me, in a way. The so-called chain of command, you know, at that point in time, was pretty rigorously adhered to. Well, Christ, that was so foreign to me. You know, if I wanted to ask a question, it didn't make any difference in the field. I didn't go to somebody's boss, to go down the line to get a question answered. I knew I could get it answered right there on the spot. Well, that kind of upset the apple cart in here for a few days when I'd call individual

engineers up, ask them a simple question, and wind up with hell from the whole line of designers from the various–well, the supervisors.

Storey: Any stories about how they "tested you"?

Duck: Not specifically. I can't remember what I was thinking about, what I would have been thinking about. It's more, again, this recognition of the so-called chain of command and the line of supervisors, that everybody's supervisor needed to know every question that was asked. It was a rigorous process in signing off on correspondence and that sort of thing. But it's a discipline that, I think, served it pretty well.

But, specifically, you know, and break it through, it didn't bother you. It never changed anything, but naturally, the people that were still at Grand Coulee then had the direct line into the Denver office, and that's where this testing, or testing wills, or whatever you would call it, kind of took place. It was questions I would answer from the Denver office that they felt like should be referred, you know, someplace else. All I felt about it, was it was going to take time. No particular purpose in it, whether it was dealing with encasement concrete over the penstocks, whether grout systems could be exited, whether the access to the grout system could be done with one catwalk system on the vertical upstream face of the dam, or whether they had to come out the downstream face, require another set of

scaffolding, and all that. I got into my discussions with them over some of those kind of things.

Quantities Contracting as Related to Removing the End of the Dam at Grand Coulee

Storey: Let's ask one more question about Grand Coulee before I ask you the next question about the Chief Engineer's Office. You told me about them toppling the end of the dam over and then breaking it up in the forebay. If I understand the way we do contracting, we normally do quantities contracting. So I'm surmising that they were bidding on the basis of the amount of concrete they had to remove–cubic yards or some such thing. And if they had to lower it in five-foot lifts, the demolition process, did they get a big windfall out of this? Did the contractor get a big windfall out of this, or how does that work out?

Duck: I would say they got a windfall out of it, but certainly it reduced the–and both from the Bureau, and, you know, oversight on the thing, as well as this piddling monitoring of every blast, but as far as looking at X number of yards, it was a hell of a lot cheaper for them to roll it into the dam forebay and secondary blast it. But that's just one of the tradeoffs that get made.

The Contractor Made Some Money on the Dam Removal, but There Are Lots of Tradeoffs in a Large Project of this Type

There would be times when somebody would be trying to get some kind of a rebate, but just in the day-to-day process of building those kind of projects, there were all kinds of tradeoffs that get made. I asked the contractor for a hell of a lot of things, a hell of a lot of things, but things that *could* be done, you know, to satisfy the quality requirements that, you know, you could argue about whether it was necessary or not. It was necessary as far as I was concerned. But there wouldn't have been a significant amount of money involved in savings, as far as the contractor was concerned.

It's another one of those things. You had the upstream cellular coffer dam. We're dealing with the foundation of the dam and so forth. I'm not sure today that I would, you know, let it be accomplished that way, because you're working more and more and more and more toward a no-risk society. Nobody wants to make a decision, to start with. As I said, it was my decision on removing the end of the dam that way. In fact, as I recall, never talked to Granger about it, other than the fact that that was what we were going to do. I looked at the shot pattern under the corner of the dam, the corner of the block, had them add some holes, looked at the amount of powder and at the way the shot was delayed, and approved it myself, so that if anything happened, they weren't going to have to hunt for who in the hell had screwed it up. But we're working farther and farther and farther away from that.

Storey: What kinds of issues came to Mr. Granger and

what kinds of issues came to you on the third Coulee powerhouse? What was the boundary between your responsibilities and authorities?

Responsibilities on the Third Powerhouse Job

Duck: Pretty fuzzy at that point in time. I pretty much had responsibility for everything that was going on in the field. From a politics, public relations–and then there was a lot of that that went on. You know, there was a little local newspaper there. The established operations and maintenance groups, it was a big group of people that were certainly going to inherit the whole thing when it was all over with. A lot of that contact, as far as the policy was concerned and the project was concerned–you know, one of the other things that went on at the same time was the excavation was accomplished for a so-called fourth powerplant.

The Site Was Prepared for a Fourth Powerhouse

There's room for another six units, depending on the size of the units and so forth, and at the end of the forebay dam is a plugged section. All that has to really be done is extend the forebay dam, and take that plug out and put the fourth powerplant in. Of course, at this point in time, I suppose that's never going to be built. But instead of the taking of property and going back to excavate for that forebay, instead of doing that in two shots, it was done under the Third Powerplant. So the excavation and the

taking of the property has already been accomplished.

"I spent an awful lot of time on safety . . ."

But as far as the day-to-day activity in the field, Roscoe left that pretty much strictly up to me. I spent an awful lot of time on safety, and in spite of that, had a number of fatalities there, but a lot of what I was looking at, from my perspective, was personal safety on that project.

Storey: And was there a Safety Officer also?

Duck: Oh, yeah, yeah, a couple of them. And the coordination meetings. Of course, I'm going back a lot of years. That effort that's made to coordinate between–get the Bureau and the contractors and the multiple contractors, all on the same page, coordinating between contractors and the Bureau, was a major part of *my* effort in the field. The day-to-day quality control activity, that was left pretty much to inspection staff. But making sure we were all headed in the same damn direction was a big part of it. That would cycle up and down, depending on, you know, how critical one step or one link in the process would be to hold up the others, the other contractors.

The Common Excavation Was a Problem Because the Contractor Chose to Use Highway-type Trucks

Another interesting part of that project was common excavation, actually out of the

powerplant area, that downstream *and* powerplant excavation, which was mostly common. There was a little rock to be taken under the Ball contract. But the contractor elected to use Kenworth trucks, highway-type equipment, and it was a poor decision. But they had a subcontractor in California–Asbury Contractors, that had subbed hauling of that material, and using these trucks, and haul through the fill.

Excavation from the Third Powerhouse Was Placed Six Miles Downstream on the Right Bank

They were six miles downstream from the dam, and on the right bank was where that material was deposited. Working through that clay, wet winter, all kinds of weather, and trying to do it with highway equipment was no mean task.

"Asbury went under with the last truckload of material that they hauled out of there. . . ."

Asbury went under with the last truckload of material that they hauled out of there. Meantime, Ball made money on every load that was hauled. Just one of those things that happened. They subbed the work to Asbury, who didn't bid enough. But to their credit, they hauled it all out of there. Years and years later, got a settlement out of Kenworth. The number I heard was $7 million, which, if it's true, they got partially well.

Storey: Did moving to Denver pose any personal

problems for you? I was ready to ask you where the next big job was. (laughter)

Duck: Yeah, that was my intention. That's where the Bureau wanted me to go–my impression. So as far as second thoughts about the next big project, didn't enter into it.

END SIDE 2, TAPE 1. FEBRUARY 20, 1996.
BEGIN SIDE 1, TAPE 2. FEBRUARY 20, 1996.

Storey: This is tape two of an interview by Brit Storey with Donald [Don] J. Duck, on February the 20th, 1996.

We were talking about any effects on your personal life of moving to Denver from Grand Coulee.

Moving to the Denver office ". . . was *probably* the start of a stressful remaining career . . . I was completely comfortable . . . on construction projects, and . . . doing what I wanted to do. . . ."

Duck: From Grand Coulee. You bet, I think that that was *probably* the start of a stressful remaining career, my whole working career. I was completely comfortable with what I was doing on construction projects, and pretty much doing what I wanted to do. As I say, at about 42 years of age, to come into *this* environment, and the environment being what it had been for years and years, elevated the stress level quite a bit.

Personal Issues with the Move to Denver

From a personal standpoint, went into Coulee, bought a house, $14,000. On the move to Denver, I told my wife, I said, "We can afford $45,000." Found a place out in Littleton that was $67,500. Well, that started the stress. Laid in bed every night for the thirty days we were here, eyes skinned open, thinking, you know, "Is this going to work or not?" And that's typical, kind of. You think you can afford $45,000, go spend $67,000. She was right. Worked out fine. That's kind of on the personal side.

I moved three horses, two cats, and a dog. That, in itself, is kind of an experience. I stopped in Drummond, Montana, and unloaded the horses at the railroad stockyards there, right in the middle of town. Spent the night. Next stop was in Wyoming, just a roadside parking area. Tied up to the fences and camped out with my dog, two cats, and three horses. Got everything moved without any bad experience at all.

Wanted to Do Things Differently than Was the Custom in the Denver Office

But then moving into this environment was different. As I say, my inclination is to not do things like they'd been accustomed to here in the Denver office, and didn't really have any problems with that. I still did it pretty much my way, and Harold supported me the whole way. I think the engineering division heads, etc., all accepted me. Ralph Gullett was one of the first

that told me he thought that was the greatest thing that happened to the Denver office, which, again, made me feel good.

Storey: Did you lateral over or was there a promotion involved? How did that work?

Promoted to GS-16 after a Year in Denver

Duck: I got a GS-15 at Coulee, I believe, and I moved laterally and got a promotion to the 16 probably within the first year or two. I can't remember exactly.

Storey: And then did you go to SES while you were here?

Went into the Senior Executive Service

Duck: Yes. That was a decision that you *could* make, at that time, whether you wanted to enter the Senior Executive Service or not. Agonized over it a while, but elected to go into SES.

Storey: When was that?

Duck: When did the SES–would it have been '77, '78?

Storey: Well, I think the SES was created under the [Jimmy] Carter Administration, so '77, '78.

Duck: '77, '78, I would say.

Storey: You went in then?

Duck: Yes.

Storey: Because you were a 16, it was automatic? Is that the deal?

Was Thinking of Leaving the Federal Government

Duck: Yes. Well, didn't have to. Could have retained the 16. Wouldn't have been a demotion involved in it. I can't remember what the advantages or disadvantages were, but in doing it, I must have decided there was more of a potential advantage in joining the SES than electing to stay out of it, although at that point in time, I was really questioning how much longer I was going to stay in government service.

Believed the Civil Service Reform Act Opened the Government to More Politicization

A number of things happened; you can argue about whether they're good or bad. From my perspective, they were bad. The Civil Service Reform Act, in itself, which created–I think SES was created under the Civil Service Reform Act. I didn't view that as a positive thing. Again, from my perspective with the Bureau, more opportunity to politicize the process, more opportunity for the political appointees to get involved in the engineering. Whether they believed it or not, they were going to get involved. I didn't view that as a positive thing at all.

"Carter's water project "hit list." The handwriting was on the wall, as far as I was

concerned. . . ."

Carter's water project "hit list." The handwriting was on the wall, as far as I was concerned. Doesn't really make a lot of difference which President you look at. The idea and the practice, in those very active years of dam building, the constituents, the water users, the power users, the subcommittees of Congress, and the Commissioner of Reclamation, the so-called iron triangle, the Bureaus. You don't necessarily need to look at *just* the Commissioner of Reclamation. But I think I first heard "breaking the iron triangle" under the [Richard M.] Nixon Administration. But that effort to break up that successful bringing-to-fruition projects that the constituents, the people, the water users, whether you're talking agricultural or M&I, whatever, anyway, the success with which those projects had been accomplished over a long period of years was going to come to an end. While Nixon didn't have anything to do with the breaking of the so-called iron triangle, the evolution of the process certainly did. Different mentality of politicians. The NEPA [National Environmental Policy Act] Act passed in, what, '72, I believe.

NEPA

Storey: '69. 1969.

Duck: It passed in '69?

Storey: Yes. There were a *whole* series of laws and acts

in there that were passed between about ‘66 and ‘75, or so. NEPA probably wasn’t really catching hold until about ‘71, ‘72.

Design of the Third Powerhouse Exterior by Marcel Breuer

Duck: ‘72 sticks in my mind for some reason. Grand Coulee–and you’re right, ‘69, or prior to ‘72, anyway–we had at Coulee, and I don’t remember how it got established, but there was an Environmental Review Board of that project. As I recall, museum directors, I can’t remember the individuals or where they came from, but that type of interest, looking over the design of that project, and also the design of the powerplant was done by, as I recall, Marcel Breuer,[15] a New York architect, who specifically was brought in to address making that powerplant fit in with the existing environment. Thus, that folded faceted powerplant superstructure. Anyway, that interest had to be prior to ‘72. It was going on during that whole design process of Coulee.

A Bald Eagle Nesting Tree Was Affected by Spoil from the Third Powerhouse

One other thing of note, and just an observation. I mentioned the six miles of fill on the right bank at Coulee along the Columbia River. *Included* in that six miles was an old cottonwood tree that was an eagle nesting tree.

15. Marcel Lajos Breuer was born May 21, 1902, in Hungary and died in New York City on July 1, 1918.

At that point in time, I could just envision, five or six years later, you know, you'd never have been able to do that. I think the environmentalists would have been able to stop that fill process because of that eagle nest. But that construction work went on for, well, the five years that I was there, and we were essentially finished with the excavation, the fill downstream. When the smoke cleared, we had more trouble with the local, the people that lived down there along the river, than we did the eagle. The eagle just left–or the eagles. Within that first year after the fill work was completed, the eagles moved back in. They were back there in that same tree.

When I visited the project, for whatever reason, it would have been the mid-seventies sometime, and I counted eighteen bald eagles in the forebay there at Coulee. Of course, they were feeding on kokanee salmon that were coming through those units. But eighteen eagles in there. And all the time I'd been there, I never saw them.

Storey: That must have been pretty spectacular.

Duck: It was spectacular, yeah.

Storey: You were talking about why you were thinking about leaving government, I think.

Thinking about Leaving Government

Duck: Well, I was beginning–you know, with Jimmy Carter, with Teton, you know, the handwriting

was on the wall, as far as I was concerned. Might be able to slow it down, but we sure weren't going to reverse it. I didn't really relish the idea of dealing with the people, and the mentality that, you know, you're going to have to deal with. I was expected to have to make a move.

Storey: You were expected?

Duck: I was expected, yeah.

Storey: Before we move more into Teton and expecting to make a move, what kinds of issues did the chief engineer and the deputy see? Or whatever the title was–Assistant Commissioner for Engineering and Research, or whatever. How did those things get sorted out? Denver office obviously does *lots* of things, makes *lots* of decisions. Which ones had to go up to the assistant commissioner and his deputy?

"I dealt an *awful* lot with contractual problems, with contractors, and money problems, and settling disputes on whatever project was out there. . . ."

Duck: Well, all the major engineering decisions were made in this office, in the office of the director/ deputy director. I dealt an *awful* lot with contractual problems, with contractors, and money problems, and settling disputes on whatever project was out there.

"We had a lot of underground construction going on, and . . . there are always problems

with underground construction. . . ."

We had a lot of underground construction going on, and while underground construction isn't any worse than anything else, really, there are always problems with underground construction.

Contractors Were Losing Money

I think I mentioned early on that that whole era after the mid-sixties, late sixties, you're dealing with the competition amongst the construction contractors that resulted in, in my view, probably too much competition. The contractors were *regularly* losing large sums of money, for one reason or another, some of which can be attributed to them and some to just the state of the construction industry, the engineering industry.

"In *my* view, it was *really* a *good* time for owners–purchasers of projects. . . ."

In *my* view, it was *really* a *good* time for owners–purchasers of projects. Yeah, you had the money problems to deal with, but as long as the quality was maintained, because of the influence of contractors taking large losses and so forth, as long as you could maintain the quality and sort out the money problems at the end, whoever was buying the projects, whether it was the Bureau or the Corps or any private, public-private, owner-type organization, they were benefitting by the competition in the marketplace. But it did create those significant

and pretty regular problems that you had to deal with. A lot of what I was doing was dealing with those problems.

Third Powerhouse Was One of the Contract Issues Handled in the Denver Office

Grand Coulee was just one of them that I inherited kind of naturally. I mentioned earlier that we threatened to place that joint venture in default, which resulted in a change in project management, project sponsorship. As a *part* of that, we agreed to make an interim payment, at that time pretty significant–I think $5 million–to keep them going. But in the long run, the claims had to be settled. As I recall, we settled for something like 14-, $15 million. The contractor still took an audited loss of $18 million.

"I mentioned that Vinnell, Dravo, Lockheed, Mannix. None of them are in the heavy construction business anymore. . . ."

I mentioned that Vinnell, Dravo, Lockheed, Mannix. None of them are in the heavy construction business anymore. Those kind of things were going on all through those years of the seventies and on into the eighties, as far as that goes.

Storey: And you were sort of refereeing that from the Denver office?

Duck: Right. Well, they were settled here. The contractors were brought to Denver, and the

negotiations pretty much took place here. On occasions, we–well, we went to the field as well, and went to the project sites. Some of the initial negotiations took place there.

In Process of Negotiating Claims with M-K When Teton Dam Failed

We were in the process of negotiating claims on Teton, which resulted in visits to Teton and discussions with M-K [Morrison-Knudsen] about what they had run into as far as their problems were concerned. Never really brought those negotiations to a conclusion with the failure, of course.

At That Time about 90 Percent of Claims Were Negotiated and 10 Percent Went to Litigation

At that point in time, I believe, our settlement rate was something like 90 percent, or nine out of ten were negotiated settlements, as opposed to litigating. The 10 percent that we litigated, we were winning about nine out of ten. So our perspective was that we were being pretty successful. The one or two exceptions would be when contractors took such large losses that the negotiation is kind of taken out of their hands, the company's at stake. They either have to collect or they don't [survive]. If you can't settle with them, those are the ones we litigated. And we were pretty successful with the litigation as well.

Storey: Tell me what happened after Teton, in Reclamation, and what happened externally to

Reclamation.

"Bizz" Johnson

Duck: Well, at the time of the Teton failure, as I indicated, I think, before, that we had the "Bizz" Johnsons still in Congress. Manny Lujan, Steve Symms from Idaho, Jim McClure, people like that, that were interested in development.

After Teton, I talked pretty regularly to "Bizz" Johnson. I seldom called "Bizz" Johnson; "Bizz" Johnson called me quite a bit at that time. "Bizz" was pretty successful in getting projects for his part of California. And not only that, he had an interest in the other states as well. That was the kind of environment that was there during that period of time.

Cecil Andrus and Keith Higginson

After the Failure of Teton Dam, Harold Arthur Was Busy with Reviews of the Failure, and Duck Was Doing Other Work of the Office

Well, with the failure at Teton, and subsequent firing of [Harold] Arthur, and [Cecil] Andrus moving into Interior, bringing [Keith] Higginson from Idaho in as Commissioner, I dealt with–like I say, Harold was immersed with these people, the independent panel, the Interior Review Group. Tremendous amount of activity went on for a long period of time, with the ultimate

publishing of the independent panel report, and the Interior review report.

Harold Arthur Fired after the Failure of Teton

Can't remember exactly how that fit, but the end result was, Harold got fired by Andrus.

Bob Jansen Brought in from the California Department of Water Resources to Run the Office

Bob Jansen, who had been with the California Department of Water Resources, and was the Executive–I forget what his title was–Executive Director, whatever, of the independent panel–

Storey: On the Teton failure.

Duck: On the Teton failure. Of course, through that activity, got acquainted with Jansen, who Andrus had gotten Higginson appointed as Commissioner. They brought in Higginson, and Jansen had a good working relationship. Higginson brought Jansen in as Director.

Review of Internal Procedures at Reclamation

Bob and I were of a different, you know, totally different background, makeup, whatever, but got along fine. He supported me and I supported him. We ran at the same time the other reviews were going on. I had concluded that the best way to head off, or beat, the conclusions, as far as the organization is

concerned, not what happened at Teton Dam, but in order to–and then there were a number of internal contracted–the Interior had contracted with a group, TAMS, to review our internal procedures.[16]

Decided He Wanted an Internal Review

I had decided, "The hell with it. We ought to do our own internal review. We know better about what we're doing here, and what might be done to strengthen the organization." Which we did. We did it in a fairly short period of time, two or three months, and published a report, with specific recommendations, some of which were adopted and some of which weren't. And probably some of the most significant weren't. That's the way it worked out. You asked a specific question about–

Storey: I was asking about how Reclamation reacted internally, and how people externally reacted to the failure.

Duck: Well, again, the internal investigation was carried out by a Bureau group, commissioned by Higginson. We were authorized to carry it out. We did that. TAMS took an outside look. They had our review to work with. We had completed that, and they had that review. Didn't come up significantly different than what

16. TAMS Consultants, Inc., was founded in 1942 as TIPPETTS-ABBETT-McCARTHY-STRATTON, and is now known globally as TAMS.

our internal report had said. Two or three minor things relating to geotechnical geology. Depending on what happens, it'll flop back and forth. But that was really the only major difference.

Reclamation's Study Argued for Centralized Design and Construction Responsibility in Denver

The big thing that didn't get implemented, or carried out, was that argument for the central responsibility for engineering and construction. We were arguing, or we argued that–

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BEGIN SIDE 2, TAPE 2. FEBRUARY 20, 1996.

Storey: –arguing that the Chief Engineer should have–

Duck: The Chief Engineer, the Denver office, should have that responsibility. It shouldn't be diluted.

Storey: For centralized design and construction?

Duck: Right. And the management of it.

Storey: Control.

Duck: Yeah. Of course, the other part, the conflicting argument was that certain of these processes should be moved to the region offices.

"It got to be a kind of a tug-of-war between the regions then and the Denver office . . ."

It got to be a kind of a tug-of-war between the regions then and the Denver office, with the investigations that were done both internally and externally, saying that they should be centralized. That's not the way it turned out. I'd say that's probably the major thing that happened that resulted in where the Bureau is today.

It's eleven o'clock.

Storey: Is it? I have another minute or two, but that's fine. Why don't we stop here. I'd like to ask you again whether or not you're willing for the information contained on these tapes and resulting transcripts to be used by researchers.

Duck: Sure.

Storey: Good. Thank you very much.

END SIDE 2, TAPE 2. FEBRUARY 20, 1996.
BEGIN SIDE 1, TAPE 1. FEBRUARY 26, 1996.

Storey: This is Brit Allan Storey, Senior Historian of the Bureau of Reclamation, interviewing Donald [Don] J. Duck, a former employee of the Bureau of Reclamation, on February the 26th, 1996, at his home in Conifer, Colorado, at about nine o'clock in the morning. This is tape one.

Just a moment ago, we were talking about the fact that you see two different Reclamations. Could you talk about that for me, please?

The Development Part of Reclamation's Program Has Ended

Duck: I see that the development part of the Reclamation program, which was what was intended originally, or initially, with Reclamation, was to bring water to the West. That's one thing, and that ended, as we were talking, sometime late sixties, early seventies, when the emphasis politically and, in fact, changed to something other than development. While everybody has their view about whether that's good or bad, I have my view. I *don't* think that the program had done everything that could be done. I think there's always going to be water problems in the West.

Reclamation Has Very Deliberately Killed off the Planning Process

Today we're living on planning that was done sixty-, sixty-five years ago, and when Reclamation, *in my view*, very deliberately started killing off the planning process, then that program was done. And it's changed to something else. I'm not sure what.

Some Operation and Maintenance Has to Be Done by Reclamation

Certainly there are those projects out there that demand that some operation and maintenance capability in Reclamation remain. With the major projects, somebody has to have the responsibility for it.

"My opinion is that the [environmental] zealots have gotten control of the program, and the purpose is to make *everything* so expensive, or costly, whatever, that you just don't build projects, you do studies. . . ."

The emphasis on the environment, I have mixed emotions about that. I certainly recognize the need for, and the interest in, protecting the environment. My opinion is that the zealots have gotten control of the program, and the purpose is to make *everything* so expensive, or costly, whatever, that you just don't build projects, you do studies. The studies never end. I think I mentioned this before. So that's the two Reclamations that I see, and how Reclamation fits into this environmental emphasis that's out there today, I'm not sure. I'm not sure.

The Denver Office Before and after the Failure of Teton Dam

Going back to a question that you asked me a couple of different times, and I don't think I ever answered it, and I'm not sure I'll answer it now. You asked about how [Harold] Arthur and I functioned in the Denver office at the time I came in and, really, at the time he left. And that was before Teton [Dam failure], after Teton thing. It was entirely different after Teton. But the Bureau was involved in a tremendous number of things. We had numbers of construction projects that were under construction.

Dealing with Auburn Dam and the Oroville Earthquake

In addition to that, we were dealing with things like Auburn Dam and the Oroville earthquake, which, you know, there might have been questions out there about the structure type of the thin arch dam, all those things, but just normal kinds of engineering questions from outside, from inside, wherever. We were dealing with that all the time, as well as the ongoing design work, and we functioned from the top. You know, instead of pushing decisions down into the organization, at that point in time, and as it had been for a long, long time, we were involved in about everything that was going on at the top. And that, from my perspective, included the way we dealt with contractors. The most effective way in getting problems resolved was to get it out of the project area, out of the project management, and into some different level, and dealing with the top-level CEOs of the construction companies. That was the way it worked.

Yuma Desalting Plant

Prior to 1976, that's the kind of things we had going on. In addition, I think the Yuma desalting plant was on the board at that time. Lots of decisions being made about that desalting plant. Reverse osmosis versus something else. I don't remember now. It was certainly foreign to what we normally did. But there's a lot of things that weren't normal that we dealt with from an engineering standpoint.

After 1976, after Teton failed, in addition to, I think I said earlier, Harold dealing with the reviews that were going on at the failure, with the congressional subcommittees, committees of Congress, and really more outside of the Denver office, I was dealing with those things that came to Denver. We, in addition, had mandated for us, I suppose, I don't remember, I don't remember now, but we did contract for a review of all the major projects that were on the board–in design.

We Contracted for Review of All Major Contracts under Construction

We contracted for a review of *every* dam that was under construction at that time. To my recollection, it was maybe seven or eight different dams. And I was involved in going to the field to participate in the review.

The results of those reviews, *as you might guess*, resulted in *added* so-called safety considerations. Nobody ever reviews anything without having a suggestion about what might be done. It's never-ending. At some point in time, if you're responsible for the design, you draw the line, and say, "That's it. We're going with that."

Well, we had to make changes in ongoing projects, whether it was with embankment dams, additions of filters, of addition of foundation protection, additional grouting. You know, it goes on and on. These projects are under construction. It was going to cost more

money, because there were changes under the contract.

Auburn Dam

So that environment started from day one, after the dam failed, until I left. It's still going on. Same way with the design process, outside reviewers looking at what was being considered and designed. Auburn, of course, fell in the middle of this. We were dealing with the *earthquake* problem before the dam failed. After the dam failed, it just escalated. That was further evidence, in a lot of critics' minds, anyway, that they'd picked the wrong structure type, and it just evolved into the tremendous amount of foundation work that was done at Auburn, and, ultimately, losing the project. The project failed to go forward. Anyway, that was part of the environment in that post-'76 year.

Robert Jansen Replaced Harold Arthur

Jansen came in in '77, when [Harold] Arthur got fired. Cecil Andrus was the Interior Secretary. Bob came out of–I mentioned this before–DWR in California, and was the Executive Director, whatever they called him, for the independent panel. I accepted the fact that I was not going to be the Director of Design and Construction, or the Assistant Commissioner, whatever the title was at that time, but thought that we could work, I could help him a hell of a lot, just by virtue of the fact that he had some contact with Reclamation people, because DWR was staffed by a lot of

old Reclamation people. And he knew Reclamation. But I knew the organization and the people both in the field and in the Denver office.

I had mentioned this internal review that [Keith] Higginson, who was Commissioner at that time, had authorized. As I recall, it was about a three-month study, which resulted in a number of recommendations, *volumes* of recommendations of changes in our procedures and so forth, the obvious things that somebody else was going to pick up. Whether they were really that valid or necessary, I'm not sure, but we intended to head off every one of the criticisms that were apt to be out there. And we did that and made it easy for Higginson to adopt, because we put a second volume in that had a signoff on each of the recommendations by the Commissioner, accepted or rejected.

The end result of that was that he accepted practically all of the recommendations that we made, and then the Washington office–it's a fact that what we were recommending, you know, it's natural that they were going to be opposed by a number of the Assistant Commissioners in Washington.

Jansen and Higginson Disagreed over Implementation of the Internal Recommendations

Thinking back on it, I think probably Don Anderson, ~~who~~ had the most objection to it, because it was just a restating of the centralized

control of the engineering operations to Denver and to the Director, the Assistant Commissioner, whoever was there, you know, signing off on who was going to be–who was going to staff construction from a management standpoint. The key people, I guess, would be the way to put it, the centralized procurement or construction contracting process. And this was always– well, not always–but a kind of a tug-of-war between the regions and the Denver office.

Anyway Bob Jansen supported everything that we said needed to be done–emphasized. Down the line, he and Higginson really got crossways over whether these things were going to be done or not. Higginson started backing away because of the pressure he was getting from the regional directors–*some* of the regional directors–and *some* of the assistant commissioners back in Washington.

The Work of the Denver Office Proceeded as Reorganization Progressed

In the meantime, you had *all* this activity going on that had to be taken care of. You know, the work was going on, these efforts at reorganization and all that really wound up in a series of reorganizations, and kept on going after I left in 1980.

Robert Jansen Moved into the Office of Dam Safety

But he got set aside into so-called the Office of Dam Safety, or whatever.

Rod Vissia Brought in to Run Denver Office

At that point in time, Higginson– and you know, I don't know, but probably some of the regional directors–pushed for bringing Rod Vissia in, who was a Regional director up in [Boise] ~~Spokane~~, I guess, at that time.

Storey: In Boise.

Duck: Boise, yeah. Rod and I had worked together. Considered him a friend, etc., etc. I sure as hell did not consider him a candidate for the Chief engineer job. Again, it changes everything. And when that happened, I had already made up my mind that probably I was going to leave Reclamation, but when that was initiated, and did, in fact, happen–I can't remember–at any rate, I made it known to Rod that I wanted out.

Position Abolished So He Could Retire Early

The end result of that was having them abolish my position, making it possible for me to leave the Federal Government at age fifty with twenty-five years of service, with the four years of military and twenty-one years of Reclamation service.

Decentralization of the Contracting Process

There were, along the line, a number of things that happened, like, I think under Jimmy Carter, the Office of Procurement Policy was established. This was coming down–the decentralization of the procurement process to

the regions.

"My view was, we couldn't even keep a *fully competent* [procurement] staff in one location in Denver, and then we were going to disperse it to seven other . . . regions . . ."

My view was, we couldn't even keep a *fully competent* staff in one location in Denver, and then we were going to disperse it to seven other, five other, whatever the number of regions were at that time. Make them responsible for it. Well, my view was that you can put it out there, but the job won't get done. And again, it's related to political pressure, various owner organizations or water user organizations. More and more staff buy involves one way or the other, with lawyers. It's easier to litigate it. Buying construction, in my opinion, was so different from buying pencils or toilet seats or hammers, and we'd already had the experience of how effective procurement types are. The idea was to get engineers out of the procurement process, and that was so far into what I thought ought to be done, it gets to be no longer acceptable. That's where I got.

Pacheco Tunnel

You were asking about Pacheco Tunnel.

Billy Martin

Some of these guys, believe me, regional directors *like* Bill E. [pronounced "Billy"] Martin, to a certain extent, Joe Hall–that's kind

of tongue-in-cheek, in a way, but Bill E. and I did a number of things together because of where he was and what was going on. I think Bill and I got that San Felipe Project out there in California going, in the face of a *lot* of opposition, as I recall, opposition in Interior.

Indexing Both the Costs and Authorization for the San Felipe Division of the Central Valley Project

In as few words as possible, we determined that while the construction cost estimate was being indexed, the authorized ceiling was not. When that got before the right people, then the ceiling got indexed as well. Still marginal, and we pulled off some design changes that brought the estimate in under the ceiling in that project. That's one of the last projects that I remember that got started.

Storey: For the San Felipe?

Duck: San Felipe, yeah.

Storey: And I think it had something to do with the tunnel. They were going to pump the water very high, and then let it flow down and change the approach.

Cost Reductions on the San Felipe Project

Duck: Change the pumping characteristics or the location of the pumping station. I can't remember what, but the designers really–and it was the design group there in Denver that came

up with an innovative way to reduce the cost, pumping cost, on that project, which made *the* difference, along with being able to index the project authorized ceiling. Anyway, that was one of the last, as I recall, *certainly* one of the last that I saw before I left the Bureau.

Bill and I worked together on a lot of different things, everything from construction personnel. I enjoyed working with him from the day I met him, I guess, and that was true of a number of the regional directors, Bill more so because of the kind of things that we were involved in out there, including Auburn.

Auburn Dam Studies

Looking back on Auburn, that was an incredible investigation that was carried out to determine whether that foothills fault system was, in fact, active or not. It had been judged to be inactive until the Oroville earthquake, which happened on the northern end. At one point in time, I think they had every trench strut in the state of California on that project. We drug miles and miles and miles of trenches, trying to determine the most recent activity. But that, again, was one of those that just–spent a hell of a lot of money on.

Storey: Auburn?

The First Pacheco Tunnel Had Serious Difficulties, Including "Squeezing Ground"

Duck: Auburn, right. And did not get accomplished.

Pacheco One, the first Pacheco tunnel, first part of that tunneling system, you know, I don't recall it, but tremendous difficulties in driving that, as I recall, squeezing ground, *really* the steel sets and so forth failing in that tunnel. Therefore, we were anticipating a lot of difficulty. I can't remember the year that Pacheco One was driven. Do you recall anybody having said?

Storey: No, I don't recall that.

In Pacheco Two the Engineering Problems Were Anticipated, and There Was Little Difficulty

Duck: Anyway, it was done in two phases. Pacheco Two, we were all geared up for all kinds of problems, and, in fact, drove that tunnel with very little difficulty. Had some contractors' claims related to one thing or another with it. As I recall, no problems as was experienced with Pacheco One.

Storey: As I recall, they drove the initial part of the tunnel when we were building San Luis.

Duck: Yes.

Storey: And then later they completed it.

Duck: Yes.

Storey: And that's when the redesign came in, I guess.

Duck: Yes.

Storey: Was in the second phase.

Duck: It really had nothing to do with the tunnel. Had to do with the pumping station, although based on the experience with Pacheco One, with the design criteria and so forth, it was engineered to avoid those kinds of problems. In fact, there was squeezing ground there, but we just simply didn't have any problems with it.

Storey: The reason I asked that question was because one of our guys had written a history of the San Felipe Project. Your name had shown up, and he said, "Oh, well, if you're going to talk to him, ask him this question." So we have the history of San Felipe.

Duck: Well, there again, just as a kind of a side thing, and my involvement in it, you know, anybody sitting on the other side can be critical of whatever the hell I did, might not like it, but we had, as I recall, some difference of opinion on the project, and it really was more related whether the contractor should be paid or not paid for some, I think, additional sets. I don't recall exactly. But I got myself in between the project people and the contractor, not the Project Manager or Construction Engineer, but some of his field people that had been with me as far back as Yellowtail.

Anyway, you know, I just kind of said, "This is the way it's going to be," and went ahead. But absolutely no problems, engineering problems, construction problems, with that part of the tunnel, that part of the project. I think the

rest of the project, significant pipeline distribution and so forth, I think it went pretty smoothly, if I recall. Of course, a lot of it was done after I left the Bureau.

Storey: But Auburn was going hot and heavy while you were there.

Duck: Oh, yeah. Auburn was going to be built. There wasn't anybody out there that could buck heads with Reclamation on any damned engineering judgment.

". . . we sure handed them the hammer to beat us about the head and ears with Teton. We would have built Auburn, . . . but for Teton. . . ."

They could stand off and criticize, but up to Teton–and I've said a million times, we sure handed them the hammer to beat us about the head and ears with Teton.

Had it Not Been for the Teton Dam Failure, We Would Have Built Auburn Dam as a Thin-arch Concrete Dam

We would have built Auburn, and it would have been built a thin-arch concrete dam, longest, highest, thinnest, whatever label you'd like to put on it, but for Teton.

In *all* of that investigation, I participated in meeting after meeting after meeting. In fact, Woodward Clyde came to Harold Arthur with a proposal–this was after the Oroville earthquake–that for a $50,000 fee, they would

use a unique capability–

[Telephone rings] Excuse me. [Tape recorder turned off]

Storey: Auburn, and all the–

Significant Work Was Completed on Construction of Auburn Dam

Duck: Right. During this whole period of time while we had the investigation going on, there were construction contracts in place and significant foundation treatment, concrete dental work. Called it dental work, but if I recall, there was something in excess of 200,000 yards of concrete that was placed in that foundation preparation work. But with the passing of "Bizz" Johnson, for one thing, and the argument over the structure type, of course, we convened a–

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BEGIN SIDE 2, TAPE 1. FEBRUARY 26, 1996.

Storey: You were saying that on Auburn, they had a board of consultants.

Duck: Board of consultants, which included both concrete dam and the embankment or rockfill dam experts. But the board was, I'd say, weighted toward rockfill-type structures as being a safer structure, less brittle, and so forth. Those arguments can *all* be made by the designers. But anyway, the opposition was building. The support had kind of gone away,

and so Auburn didn't get built yet.

Storey: Yeah, I know Mike Catino really wanted to built Auburn.

Duck: Oh, Mike was another one of those guys that just was an old–we were all Reclamation, you know. It was in our blood. If you couldn't get it one way, you'd get it another. He was another one of the real good guys in *my* category of good guys. We fought long and hard to get Auburn built.

Storey: You mentioned that you had these independent studies of Reclamation dams in progress and all of that. Even now at Reclamation there's a sense, "Hey, we're the best dam builders in the world." Did that cause problems?

Even today ". . . we don't know, *exactly* what the failure mechanism was. . . ."

Duck: Well, problems–I'm not aware of any profession, and I'll take what I'm about to lead into as a sub-profession, in my opinion, no way a profession, and that's journalism, or anything related to the media. They're the only sub-profession that I know of that defends *adamantly* their right to be wrong, and for the sensationalism or whatever it is related to any failure, any accident, there's a need to place blame.

". . . you certainly felt a sense of responsibility for everything that was going on, including Teton. I sure as hell didn't feel the need to take

any blame for it. It's an engineered project. Something didn't work. . . ."

And in those jobs, whatever we're doing, you certainly felt a sense of responsibility for everything that was going on, including Teton. I sure as hell didn't feel the need to take any blame for it. It's an engineered project. Something didn't work. Today, they don't know, we don't know, *exactly* what the failure mechanism was. I know, and I think everyone knows, there are some things that could have been done, probably should have been done, that would have prevented it.

The Big Thompson River flood drew some attention away from the failure of Teton Dam

But living with these media types for a year or something like that, after that failure, I had already lost a significant amount of respect for those people. Lost a significant amount *more* when we got all done with them, when they disappeared, and eventually they disappeared. In fact, interesting to me was that there were nine to eleven people that lost their lives in that Teton failure, and within a month, I believe, the Big Thompson River flooded. At the time that was going on, I was hauling hay from Brighton, Colorado, and I sat out there with the daughter. She was driving the pickup, and I was picking up hay out of the field, and I watched that cloud hang over that Big Thompson Basin *all* afternoon.

Well, I'm sure you recall the–I think the

final number was like 238 deaths that occurred in that flood. Believe it or not, that took some of the interest away from Teton. By any means, take everything that was going on, as far as the *L.A. Times*, *St. Louis Post Dispatch*, some of the major news magazines, but at least it lifted the local interest in Denver, took it away from Teton.

". . . there isn't anything that's going to dampen that feeling, that ego, that goes along with having been a part of some very successful projects. . . ."

At any rate, I'm sure there are enough people left that are close enough to, one way or another, the history, the tradition, the accomplishments of Reclamation, that there isn't anything that's going to dampen that feeling, that ego, that goes along with having been a part of some very successful projects. That's true internationally, even more so. There was a lot of interest in Teton, and Harold, myself–of course, Harold was gone from the Bureau. [Telephone rings. Tape recorder turned off]

"That failure [at Teton Dam] did not impact and affect the international reputation of the Bureau at all. . . ."

That failure did not impact and affect the international reputation of the Bureau at all. There have been other, and with more loss of life, more property damage, dam failures–Malpasset, Vaiont, to name a couple, in Europe,

that had to do with concrete arch dams.

"Failures are a part of the engineering construction process. . . ."

Failures are a part of the engineering construction process.

Talk at the National Society of Professional Engineers on the Failure of Teton Dam

I recall having participated in a National Society of Professional Engineers conference in Denver, and this was after I had left the Bureau. What they attempted to do was put some key people who had been involved in projects that had failed for one reason or another. Of course, Teton was high on their list. They couldn't get anybody in the Bureau to talk about it. Understandable. They had the Hyatt failure in Kansas City.

Storey: Oh, that skywalk thing?

Duck: Skywalk thing. They also had, as a participant, the reporter for the *Kansas City Star*–there were a couple of them, I can't remember. He was a–what's the award? Did he get a Pulitzer for that? I believe. Anyway, the engineer involved in that Hyatt, the design and construction, I guess. That ultimately turned out to be, I guess, a construction error that caused that failure. And also the Rosemont Horizon in Chicago, the collapse of the roof on that facility. Somebody else, as I recall.

The Tendency after a Disaster Is to Guard Information

At any rate, everybody there, because of restrictions placed on them by attorneys, turned out, couldn't really say anything, didn't really say anything. I ran through the whole Teton failure bit with my ideas, what I had to say about it, without any legal counsel or anything else. I just did it. But it was interesting to me. There were some lawyers involved. My bottom line was that when these things happen, you simply clam up. You don't try to level with. You're going to get burned every time. Every time you try to level with these people, it gets either taken out of context, they don't understand it, or whatever.

Storey: This is the lawyers or the newspapers?

Duck: Newspapers. They had a couple of attorneys there, too. Interestingly enough, the attorneys that followed me, that was exactly their position, as well. Given what's involved, and it gets back to the way Harold Arthur handled this whole thing. While he was criticized outside, inside, everything else, I think he did one hell of a job of handling *all* that scrutiny post-Teton. The couple of lawyers that were in this panel in NSPE took the same position. Of course, the reporters took exactly the other. "You ought to be open. Tell us everything."

The media want fast information and often publish the wrong information on disasters

That particular story on that Hyatt failure, that balcony failure, whatever it was, the newspaper went to some college professors, and they put it all together, and they put it together quicker than the official review of what was going on, and published it. They were proud as hell of that. And it turned out all right. It turned out to be probably true, what they came up with. But nine times out of ten, it isn't.

Believes the Media Is Most Interested in the Initial Impact

They'll publish it, and there will be some other cause, some other related thing, unrelated thing, and that never gets reported. What you see initially sticks in your mind, and, of course, that's what they were advocating. They like to make those headlines. At any rate, next question–

Storey: You mentioned that they abolished your job, and that meant, I guess, that you could retire early?

Duck: Yes. Gave me the option–

Storey: Were you planning to actually retire when you left?

Duck: Yes.

Storey: What happened then?

Let it Be Known at a USCOLD Meeting That He

Was Leaving Reclamation and Was Approached by Three Companies

Duck: I had been talking to, really, three different private companies. I had let it be known at one of the USCOLD meetings, and if I remember right, it was–

Storey: U.S. Council on Large Dams?

Duck: U.S. Committee on Large Dams.

Storey: Committee on Large Dams.

Duck: At a meeting in San Antonio, can't remember exactly the time of the year, but my guess, it would've been March-, April timeframe. I'd made up my mind at that time that I was leaving, one way or the other. I forget what I was–I had something I was presenting at that meeting, and the way I presented it, everybody knew that I was leaving the Bureau.

I was contacted by the principals in Harza Engineering Company. At that time, it was ~~M-K-E–not M-K-E–it was~~ IECO [phonetic]. Later that was Morrison-Knudsen's engineering arm, based in San Francisco. And R. W. Beck, up in Seattle. Jim Williamson, Dick Koenig [phonetic], from IECO. Anyway, they picked up that I'd made up my mind to leave. One way or the other, these people were involved or their companies were involved with some of the review work that was going on, of construction projects and design work that was being done in Denver. We contracted with various companies

to look at certain projects. These people were all involved, and I'd known them for years anyway, one way or the other–through the Bureau, through USCOLD, and through ICOLD.

Anyway, all three of them contacted me before I left San Antonio, and I started an interview process. Both Harza Engineering Company and R. W. Beck were privately held companies. Beck was a partnership. Harza was a corporation, international corporation, as well as domestic. Of course, IECO was publicly held. In going through the process, it appeared to me–of course, probably Harza was closer to what the Bureau did, and they had, of course, a very significant international operation. They had been involved in some major–and were at the present time, or at that time, and still today–involved in some major dams overseas–Iran, Iraq, these desirable places. Probably as significant as anything was their long-time, *long-term* involvement with Guri Dam in Venezuela–Guri, the raising of Guri, and then the downstream projects, the Caroni projects. They just were getting under way with Yacyreta, Argentina. They had dams under construction in Honduras, or power projects in Honduras, in El Salvador. Incidentally, a great time to be involved in El Salvador–mid-eighties. (laughter)

Harza Was Doing Things Similar to Reclamation's Work

Anyway, talked to all of them. Had been

friends with all of them, and knew their people, knew their organizations. It was just a matter of making *a* choice of where I was going to go.

"Chose Harza . . . because . . . what I wanted was to get out of that *top* management, get back down to construction . . . what I liked to do . . ."

Chose Harza, as I say, because the kind of work they did was just exactly what they wanted [me for], and what I wanted was to get out of that *top* management, get back down to construction, get back into what I liked to do, what I really felt like I wanted to do. And they were looking–and each one of them had their place, to pick whatever, really, I wanted to do, the head of the construction group, and responsible for all the field construction activity, the staffing, the coordination, everything related to getting projects on the line, in service, and signed off on.

Harza Offered an Opportunity to Participate in Ownership of the Company

Harza–one, privately held. It was an opportunity to participate in the ownership. R. W. Beck was the same thing. Organized a little differently, but the opportunity to participate in the ownership. Difference with Beck was they were much smaller. Their water resources group, at that time, was up to maybe 125 people. Harza–again, pretty much all water resources– was 600, 650, 700–different scale organization-wise.

". . . it looked to me like Harza had the most to offer. . . ."

M-K. For one thing, San Francisco. Didn't have any great desire to move to California. Seattle; you know, I knew the Washington area, desirable place to live. But from the standpoint of what was on the boards, what was going on, it looked to me like Harza had the most to offer. You could participate in the ownership. You bought the stock in M-K, and so forth. But even at that time, looking at M-K management, the way they were structured between Boise and San Francisco, it just looked to me like Harza was the best choice for me. As it turned out, I didn't learn until I got to Harza that things were not as they appeared to be, as I guess maybe they never are. I don't know. Anyway, those private engineering companies have accomplished a whale of a lot around the world and domestically as well. They do it a different way.

Harza Didn't Have the Same Depth of Staffing That Reclamation Had

The lack of resources that I mentioned before was a stark contrast to what we had in the Bureau. I think at the time I left, we had something like 2,400 people in the field. That's a lot to draw from. Then there was like 1,400 in the Denver office. Tremendous amount of resources to draw on. But in looking at *all* of the private companies that I am familiar with, or were familiar with, the amount of expertise, the amount of engineering guides, design,

construction, testing, that the private sector relies on is incredible, and still is today.

The Private Sector Relied on Reclamation Innovation and Knowledge

The private sector relied on the Bureau and, to some extent, the Corps of Engineers, although *I* didn't observe as much of the Corps-type data being used as I did the Bureau.

The Private Engineering Companies Had less and Relied on Reclamation Standards

The Bureau was the international standard, and it was amusing, amazing, and everything else, to be from the Bureau and have this stuff quoted back to me from a private engineering company, you know, the top engineers, the design people, that were relying on Bureau standards. They do a lot of things with less resources, but, in fact, they were relying on the Bureau, and they could go to the Bureau at any time as far as technical information was concerned, and technical papers being presented all the time that were sopped up by these people, sitting on the outside, as I was then.

Used Reclamation to Recruit While at Harza

Well, I never gave up my contacts with the Bureau. I was either on the phone or hiring someone. That was my pool when I was with Harza Engineering Company, for construction-type inspection, supervision, what have you, in the field. I'd find some Bureau either recent

retiree, some of them weren't retired. Some of them were just fed up, as I had got fed up. Today, Harza Engineering Company's Chief of Construction is Steve Ziegler, that I brought out of the contract administration group to help me in Harza. He quit. He didn't have enough years to retire, but he resigned from the Bureau and is still back there in Chicago. He was one of the first that I brought in. But used all kinds of personnel, field-type people. A good pool to draw on.

Bath County Pump Storage Project

I don't remember exactly the number of people that were involved in the Bath County Pump Storage Project.

Strontia Springs Dam

Domestically, one of the first things that I got involved with was Strontia Springs Dam. Harza Engineering Company did the design work for Strontia Springs for the Denver Water Board. For one reason or another, M-K had the construction contract on that project. They bid it like they were going to build it in a year. It took them two years to build it, and the associated problems that went–you know, contract problems, construction problems, cost overruns, went hand in hand with that. And I was instrumental in getting that project completed, claims settled, and in-service. But, as I say, it was one of the things that I seem to have some skill at, and by knowing everybody that is involved, I could go as high in M-K as I

needed to go. M-K took a pretty significant loss, supposedly.

Again, the way contractors can handle equipment costs, those kind of things that you don't know for sure, but, again, at that point in time, the Denver Water Board was made up by a housewife, a couple of lawyers, a construction type–can't remember–you know, today they're all, *I think*, all lawyers and environmental types. Jim Kenney, who was the construction type, in fact, owned a construction company and had been chairman or president of that board, was not at the time, he'd passed that along to somebody else, but, you know, if it hadn't a been for a Kenney type, who knew construction–if it had just been a bunch of lawyers, you're never going to settle anything.

Lawyers and Political Types Tend to like Litigation Which Drives up Cost and Takes More Time

They would rather litigate it and let somebody else decide. The political types tend to feel more comfortable with the judicial system, taking the problem out of their area, let somebody else decide it– right, wrong, indifferent. And, believe me, *I believe* that they'll come up with the wrong answer, at increased cost, about any time.

M-K Had Major Claims for the Strontia Springs Dam Project

Anyway, M-K had generated some $40-,

$45 million worth of claims, as I recall. Maybe it wasn't that much. Something on the order of magnitude. We settled it for $6 million, settled those claims. Everybody signed off on it, including the M-K lawyers. They got outside representation. But nobody believed that they could be settled, and M-K alleged later that they were out of pocket $14 million.

Thinks M-K Might Have Been out of Pocket 8-10 Million Dollars on Strontia Springs

Well, I don't believe the $14 million, but it was *some* significant number, and I would guess eight or ten anyway, that they were out of pocket on that project, in part due to their own management. Bid it to do it in a year, and then failed to get started.

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END SIDE 2, TAPE 1. FEBRUARY 26, 1996.

BEGIN SIDE 1, TAPE 2. FEBRUARY 26, 1996.

Storey: This is tape two of an interview by Brit Storey, with Donald [Don] J. Duck, on February the 26th, 1996.

Duck: The inclination would be to hand it to somebody else and let them decide it. And that's the way so many things have gone these days. At any rate, for some number of years, it was– well, from 1980 to 1986, I was enjoying what I was doing, except that international travel gets to be a drag when its so much and all over the world.

". . . from 1980 to 1986, I was enjoying what I

was doing, except that international travel gets to be a drag when its so much and all over the world. . . ."

Storey: You were the Chief of Construction?

Duck: Construction, yeah, right.

Storey: For Harza?

Duck: Yeah, and, of course, they wanted me involved in everything that was going on, whether it was projects that they were trying to acquire–you know, design work they were trying to acquire, construction management work. And, I was involved in everything. The first Thanksgiving that I spent there, Earl Beck called me in on the day before Thanksgiving, wanted me to go to Honduras. They had a problem with a drop shaft for a hydro project. So on Thanksgiving morning, I boarded an airplane for Honduras. That *pretty* much said it for the rest of my time with Harza. It was a lot of fun. It was a lot of travel.

"So on Thanksgiving morning, I boarded an airplane for Honduras. That *pretty* much said it for the rest of my time with Harza. It was a lot of fun. It was a lot of travel. . . ."

I spent a significant amount of time each month, probably seemed like it was more, but at least once a month I was down in El Salvador, in the middle of that civil war that was going on down there, in large part because you couldn't get really anybody that was competent, that was

crazy enough to go down there and stay. So I was spending a week or two a month in El Salvador at that time.

". . . I was spending a week or two a month in El Salvador at that time. . . ."

Bath County Pump Storage Project was a major, major project for Virginia Power. Got shut down, got tangled up with the whole nuclear–the *tremendou*s cost that power companies who had gotten involved with nuclear powerplants, the cost of shutting them down, of walking away from them. That was being absorbed at that time, which is the early to mid-eighties. Therefore, this hydro project got kind of tabled for a while, then started up again in 1985, '84, along in there. Harza wanted me involved in that project, and I'd heard enough about it from friends in FERC,[17] and back door, that that was one I just said, "No, I'm not going to have anything to do with that."

Didn't Want to Be Involved in the Bath County Pump Storage Project for Virginia Power Which Had Been Tabled Because of the Impact of Nuclear Projects on Cash Flow

Some months went by, and they hit me again. They were *really* having trouble with the managers out there, with the Project Manager for Virginia Power and our manager and all, so

17. Federal Energy Regulatory Commission.

I said, "What I would do, first of all, is for Dick Harza, Earl Beck, John Veltrop, key people, Chief Engineer, go out there and sit down at the table with Virginia Power, and you say, 'You take your manager off, we'll take our manager off. We'll start from scratch and see what happens.'" And that's, in effect, what they did. Pissed a lot of people off, but then I got myself involved in that project.

This was coming up in 1986, and what happened to me there was exactly what had happened to me in the Bureau, as far as I'm concerned, from my view. They elected me president in 1986, and the Bath County–about that time, the wheels came off, as far as I was concerned. The tunnels, three thousand foot shafts, long, large-diameter tunnels, leaked. [When we] started to water-up to get into the testing program– To make a long story short, the water pressure in the tunnel was higher [than the rock strength would take.] ~~–and, of course, outside the tunnel. Not unreinforced concrete line, but for whatever reason, the design would have been for unlined tunnels. I mean, that was the way it was viewed.~~ The lining was just a kind of a superficial thing; it wasn't watertight. The water pressure in the tunnel exceeded the stress in the rock. Therefore, when the water got out of the tunnel, there wasn't enough stress in the rock to retain the water. Therefore, it could go forever. Called hydro-fraction, [hydrotracking] ~~hydrospreading~~, whatever.

Elected President of Harza in 1986

Anyway, we went into a high pressure grouting program that had never been really done in this country before, that I'm aware of. We were grouting up to 600 psi at the surface, actually splitting the rock, injecting cement, and sealing it up for a distance of 30-, 40 feet around the tunnel.

Had to Use High Pressure Grouting on the Tunnels at Bath County Power Project

At any rate, at the same time they elected me President, they made me take the Project Manager job for Bath County. So, I was dealing with trying to get Susitna[18] under way. We had the design work on Susitna in Alaska.

"At any rate, at the same time they elected me President, they made me take the Project Manager job for Bath County. . . ."

Trying to Keep the Susitna Project, a High Arch Dam, Going

Storey: That's a powerplant, a hydro plant?

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18. The Susitna Project is a hydroelectric generation project in Susitna, Alaska. Harza designed and constructed what was then the highest rockfill dam in North America. Source consulted on September 29, 2006: http://www.fundinguniverse.com/company-histories/Harza-Engineering-Company-Company-History.html

Duck: It was a high arch dam, with a power component, yeah. It was really the downstream dam, the first dam. Then the *major* storage facility would have been a structure called Watana [Dam], upstream from Devil's Canyon. At any rate, we were trying to keep that going, we were doing the licensing work on that project, flying the red-eye back from Anchorage to Chicago. I logged, at that time, 100,000 miles in, I think it was 1986, on Piedmont Airlines, in 750-mile increments. (laughter) At the same time, hitting Venezuela, Argentina. That was my life.

Anyway, we did put Bath County in service. It was another one of these where we had *every* so-called "expert" in the country on the payroll, on Virginia Power, VEPCO's payroll. One or two that the Rate Commission had managed to hire. But in that kind of environment, fishbowl, every expert with some, whatever suggestion there was–anyway, we were spending at the rate of $12 million a month on remedial grouting, and I wasn't sure who was paying for it. I knew if it was us, we didn't have the money. I can recall sitting in a meeting at the project where all the Virginia Power people, with their lawyers–and at that time there were probably four or five lawyers. In fact, the President of Virginia Power, at one point in time in the first meeting, asked me where my lawyer was. I said, "I don't have any." I said, "In my opinion, if it gets to that, we're done anyway."

Bath County Went into Service

On the Bath County Project "we were spending at the rate of $12 million a month on remedial grouting, and I wasn't sure who was paying for it. . . ."

And we got all those problems worked out. It did not take really any litigation of any kind against any of the parties–contractor, engineer. Never even came into the picture. From my perspective of what was going on all around the world, all around the country, you know, those kind of problems simply *could not* have been solved but for the people, the attitudes that were there with that group at that time.

Worked out the Bath County Project Overruns Without Litigation

Going back to Denver, the same way. If it wasn't for those people that were involved–back to Denver, I can remember when the whole thing got settled, I met with the Denver Water Board in their typical city–you know, *beautiful* conference room, or board room, sitting there looking at this cast of characters sitting up there, going to sit in judgment of this whole thing. I went through what should be done, and then heard one of their outside counsel talk about what he thought should be done. Dick Harza was sitting there with me, as well as their Project Manager, and I simply got up and said, "It's obvious to me you people want to litigate. Get me out of it. Go

litigate it." And left the room. Dick Harza about had a goddamn heart attack.

Settling the Strontia Springs Claims Without Litigation

But I also went over to the Sheraton, where I met with the contractor's negotiating team, and I said, "I just told the Water Board that I'm out of it. I said, 'You guys want to litigate it, go litigate it.'" And what they ultimately did was meet the next day and settled it.

It was the same sort thing at Bath County, making the decision what had to be done, going ahead and get it done, and the owner taking responsibility for it. And that, I'm sure, got us a lot of criticism in the Bureau, because that was *exactly* the way things were done. If you got to absolute loggerheads, *could* not settle it, the magnitude of the dollars got so great that it couldn't be settled, they were litigated. But if you could settle, get on with the next one, that was the way it was done.

Strontia Springs and Bath County were similar–"making the decision what had to be done, going ahead and get it done, and the owner taking responsibility for it. . . ."

"If you got to absolute loggerheads, *could* not settle it, the magnitude of the dollars got so great that it couldn't be settled, they were litigated. . . ."

Storey: How long did you stay with Harza after you were made President?

Duck: I was elected President in ‘86, chairman of the board in ‘87, and left in ‘90. I promised Dolores when we moved back to Chicago, we’d be there for five years. Stayed ten.

Elected Chairman of the Board at Harza in 1987

Left Harza in 1990

I brought in, from outside–when I was elected to Harza[‘s board], there were all kinds of things I didn’t know about, and I’d been on the board for two or three years. The company was down $3 million in Algeria, a couple of million dollars in Argentina. This is write-off-type stuff.

When Elected President of Harza There Were Losses and a Declining Workload to Deal with

Storey: This was when you became President?

Duck: Uh-huh. Those engineering costs had already been incurred, had not been accepted, never were. *And* the workload was declining. All the water resources, the engineering owners, what have you, that workload was declining from what it had been, fifties, sixties. Fifties–the overseas work, dam-building work, was going at about the same rate it was in this country. Early sixties, and so forth. But as you might guess, or as anybody might guess–and I don’t

know what this has to do with the Bureau history, this is more my history than it is Bureau history–but the declining workload, the fact that you had more senior people, as any organization, when they start cutting back, they seem to cut off at the bottom, and the higher-paid senior people, whether they're really productive or producing at that time– certainly, in their history, they had been productive people, but a lot of complacency, a lot of retired-on-the-job-type people.

Well, to make a long story short, over a period of about a year, given the workload that we had, the revenue flow, and so forth, bought back into the company about 50 percent of the stock in the company. Fifty percent of the outstanding shares were in these people that I was responsible for letting go. At the same time, the candidates for *key* jobs, *like* the Chief Engineer, there wasn't one in Harza. Therefore, I brought in a Bureau guy to be Chief Engineer of Harza Engineering Company. That went down pretty hard. As I say, this was '87, '88. I was Chairman, President, CEO.

In the First Year Bought out 50 Percent of the Ownership of Harza and Cut Overhead Staff

In '88, the same thing could be said for marketing. In a private company like that, there's a tendency– *more* than a tendency–for productive people to try to get on overhead accounts. In other words, not have to be billable, slip into the overhead. Had a hell of a lot of that. And that's a lot of where the cuts

were taking place, out of overhead. People that were on billable project work *and* doing the job were pretty safe. Not entirely. Depending on how good a job they were doing, and so forth.

Anyway, the same thing came along with the marketing group, with the head of the marketing group, *and* a couple of other things. I ran this thing as a dictator. There was no question about it. Number one, you know that I wasn't brought into the presidency of that company, or made Chairman of the Board, if they'd have had anybody internally that they felt was capable of dealing with the problems that they had to deal with, which were self-generated, company-generated, as far as I was concerned.

At the same time [we] were acquiring the Rocky Mountain Pump Storage Project for Oglethorpe Power in Georgia. That was a project that had been mothballed because of the nuclear problems at Georgia Power. They had started it, or had it on the drawing boards. The project was licensed, but mothballed. Oglethorpe took over the project, acquired the license, and Harza–we got the contract for doing the engineering work.

Rocky Mountain Pump Storage Project for Oglethorpe Power in Georgia

At any rate, I created a hell of a lot of enemies in that four years that I was CEO of the company. Made a hell of a lot of friends, too. But we were making money. The prospects, as

far as the international work, looked great. From really the midpoint in my career with Harza, I was saying, "It's this way or I'm going to Colorado." And you can hold that club [only] so long.

Made Enemies and Friends While CEO of Harza

In the latter part of 1989, 1990, I got into a loggerhead with the company over, again, bringing in outside people, replacing the Harza career people, moving the office, and a couple of other things. The result was, I resigned and came to Colorado.

Resigned and Moved Back to Colorado

Storey: But there was a lot of drawing on Reclamation staffing, while you were there.

Duck: Absolutely.

Storey: A lot of people think, "Well, I retired. Why does he want to know about this?" It's because the ties to Reclamation just keep on going.

Duck: For sure. And some of the assignments were dirty. Overseas–you know, Jordan and the Latin countries. The environment's not–Latin America, Venezuela, Argentina, they're different, but it's not like those Middle Eastern countries. It's not like China.

I was a member of the first so-called Technical Exchange Group, whatever it was, in 1978, to go into mainland China. Would that

have been right? Yeah, that was the right time frame. It was Higginson. Who was the Assistant Secretary? Lawyer, Alaska, Bill. It was an experience to be with that group in China, looking at what the Chinese wanted, as far as hydro. It was a hydropower delegation that I participated with. Jack Morris, who was in Corps of Engineers, was one of the participants. Tennessee Valley Authority were there to talk about transmission lines. It was supposed to be a technical exchange. Didn't really turn out to be that way. But out of that, Harza came up with the design work, assisting the Chinese on a dam called Ertan, big hydro project on the Yangtze River. And the opportunities for water resource development, water resources in China are just mind-boggling, and they're intending to proceed with them. They *do* intend to develop their water resources beyond where they are now, including the Three Gorges Project.

Participated in the First Technical Exchange Group Sent to China

Harza Worked the Ertan Project on the Yangtze River

Storey: I think I have a few sort of clean-up questions about Reclamation.

Duck: Okay.

Storey: One of them, you mentioned that Reclamation killed off the planning process. Could you walk me through that?

Duck: Well, I don't remember. I think you can get that from the Regional Directors better than me. As far as the Denver office is concerned, it functioned like, I think, a technical advisory group. Overview, maybe, of planning that was going on, and technical assistance, maybe, of one kind or another. But I can remember some specific– well, can't remember specific–but anyway, reorganizations within the regions, and de-emphasizing, or what, you know, was the appearance to me that the planning effort was being de-emphasize, that planning staff were being cut. Catino or Bill Martin didn't talk about that at all? It happened.

Decline of Planning at Reclamation

Storey: Was this while you were still out in the field or while you were in Denver? When was this?

Duck: It would have been while I was in Denver.

Storey: During the seventies, then.

Duck: Anyway, it was apparent enough to me that there was–I saw Warren Fairchild's name in there, I thought. Anyway, Warren was responsible for something–not sure what. But the rigorous planning, I forget what they even called it, but anyway, they developed new planning procedures, I think under Warren Fairchild.

But then later on it was apparent to me that they were killing off–the politicians, the politics, wherever–the leadership was intending

to kill off the planning process. And when that goes, everything else goes, as far as the *traditional* activities of Reclamation.

Storey: I'm going to try and see Bill next month.

Duck: See Bill–

Storey: Bill Martin.

Duck: Yeah. Give him my regards. Some of the most fun I had, given the time and what was going on, was with Bill Martin.

Storey: During the seventies, while you were in the Denver office?

Duck: Yeah, latter part of the seventies. Well, you know, everybody rowing to beat hell with Teton out there, and sinking the boat.

Storey: Tell me about Bill Keating. You mentioned him. He was an Assistant Commissioner.

Duck: You know, he was an Assistant Commissioner. I can't remember what area. Bill was outspoken. My contact with him had been minimal. You know, all I knew was really a position, and I didn't really know any of those positions. Got to be a little more familiar with Don Anderson later on– administration.

Storey: And he's my next question.

Duck: Oh, is that right? Keating and those people, you know, had the contact with the congressional

staffers, and they were the liaison, really. But Keating, first contact I'd had with him was a telephone call out at Asilomar, and then, of course, I saw him, talked to him when they had me come into Washington. Given the time and everything else, they put me up at the Presidential Hotel. That was the only place that they could find, and it was *the* biggest of the fleabags that I ever stayed in there. You know, it had a bare bulb and an extension cord running under the rug. I didn't know whether to go to sleep or not that night.

Then later on, I had more contact with Bill. I'd have to look back to see what his title was, but in relation to things that were going on at Grand Coulee, for the most part. Coulee was a major, major project, and a politically sensitive project at that point in time. Was that a Hickel period or not?

Storey: Hickel?

Duck: Walter Hickel.

Storey: The Secretary of the Interior.

Duck: Secretary of the Interior. Now Governor of Alaska.

Storey: Well, I keep all of these lists for this kind of thing. Hickel, '69 to '70, is when he was Secretary of the Interior.

Duck: Sure. That would have been the time frame. About the same time as Ellis–

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Storey: Grand Coulee was a high-profile project.

Duck: Very high profile.

Storey: Hickel might have been involved, somehow indirectly.

Duck: Indirectly, yeah. But then again, he wasn't around long enough to–

Storey: Almost two full years.

Duck: Yeah. Keating was, again, an outspoken, rough, I think, "Get it done" type of person. That was the way I remember him.

Storey: What about Don Anderson?

Duck: I think I mentioned he was a real opponent of the centralized Denver office, or grew to get that way, or whatever. He was a supporter of the Regional Directors having more authority, more control, responsible for a lot of years of the congressional liaison with the various staffers of the subcommittees and the subcommittees themselves. Lived in that environment for a long, long, long time. He had his opinion.

Don Anderson opposed centralized Denver office and supported regional directors

Storey: You mentioned earlier today that you knew a lot

of people in Reclamation, but when we were talking in the previous interviews, I sort of had the impression, at Yellowtail and at Coulee, and so on, that that's where you were. You weren't doing a lot of getting out and meeting people. Was that an incorrect impression, or did you meet people after you moved to Denver? What were you referring to there?

Duck: Well, just given my career with Reclamation, I came into contact with a heck of a lot of people. You look at Flaming Gorge. It was a relatively small group. When I moved to Yellowtail–Granger brought me to Yellowtail. I don't believe that other than, I think, Don Fillis was at Flaming Gorge, but that group went all different ways. The young engineers left the Bureau. I think Don went along later with me to Yellowtail.

How He Met Many People

The only person besides Fillis, as I recall, that had dam experience was a GS-7 technician that came from Glen Canyon, and we built that group out of what was there in the region, for the most part. A couple of other key people came from Glen Canyon. But technicians, like Bill Grimes, as far as excavation, he went with me to Yellowtail. Now, names of the–you know, *like* a Jim Simmons, who was a technician in the batch plant, the Dewey Erich, some of the local people that were engineering technicians, and so forth. I remember–in fact, I've run into a couple of them when I visited Flaming Gorge, out there, couple of years–well,

couple of years–'91, I guess, was the last time I over there. Keep threatening to go fishing at Flaming Gorge. Don't get there.

Then you got the group at Yellowtail and the group of technicians that you assembled from mostly the region. As I say, a couple–one from Flaming Gorge, one from Glen Canyon. And then hired a handful of young engineers, new graduates, that went into similar to what I did at Flaming Gorge. Let's see. Bill Wyatt, Ed Makoff [phonetic]. These guys are all retired now, too. Lyle Cardin was at Anchor Dam. And a couple that left the Bureau. Young engineers or recent graduates. And that group of technicians that are really the backbone of an inspection program. You pretty rapidly promote these young engineers into supervisory positions, and they have a group of technicians that will work them. At the same time you meet, and are exposed to, *all* the contractors' people, especially in the supervisory level, and down to the workmen level, vibrator hands, carpenters, whatever. You get to *know* these people.

Well, you had the Flaming Gorge group, which was mostly Kiewit people, key people. Yellowtail–you have the M-K people, and some of the M-K people that were on the project–now retired–but we followed each other all the rest of our careers. Over at Grand Coulee, we took some of the people from Yellowtail, brought some of the people from Glen Canyon. Again, took some of the key engineering people like the Makoffs that I mentioned, the Wyatts, the

Sommerdays–Sommerday, who was with me for a long time with Harza, in the field. But that cadre of engineering–you know, degreed people, and then the technicians that were pulled in from various projects. Again, Vinnell, Dravo, Lockheed, and Mannix. Had the Vinnell people that were originally sponsoring the project. That group turned over. We had the Dravo people, and you get to know those people from the top part of the organization right down to the common labor.

Storey: So you end up with a *big* pool of people.

Duck: Well, over that period of years, you get to know tremendous numbers of Reclamation, engineering, construction, and contractors' construction people. And then, you know, moving into Denver, you get acquainted with that [group]–and certainly didn't know everybody, first name or anything else, but as I say, I think there were maybe 1,400 people in that office at that time. Plus *all* of the project people then that I got acquainted with, had maybe heard of or knew about. And at some point in time, during that eight years that I was in Denver, probably had something to do with their assignments, with where they were going. We had the responsibility for making sure that construction projects were staffed with the right kind of people. I think I said early on, it takes, you know, the one guy, and then two, three, four people that know what they're doing, and you can take it from there and do wonders.

Storey: Good. Well, I appreciate you spending all this

time with me. I'd like to ask you again whether you're willing for the information on these tapes and the resulting transcripts to be used–

Duck: Sure, if it doesn't get me put in jail. (laughter)

Storey: I don't think it will. (laughter) Thank you.

END SIDE 2, TAPE 2. FEBRUARY 26, 1996.
END INTERVIEWS.