DON BURDICK

TAPE 5, Side 1

November 14, 1996

M.O'R.: It's November 14th, 1996, and this is a continuation of the oral history with Don Burdick, and today's interview is taking place at the offices of the Lake Oswego Corporation, and I'm Michael O'Rourke for the Washington County Historical Society.

One thing we talked a little about last time but I had one remaining question about is the development of consciousness on the part of the Lake Corporation about water quality after you came on the board and about some of the studies and measurements that you make to determine what the quality is. I noticed that you have a lab downstairs of sorts, and I'm wondering when you acquired that capability and how do you use it?

D.B.: Well, the awareness of the need for water quality testing was coincidental with the timing that I came on the board, but it wasn't entirely my idea. I think that we had several board members who began to realize that we ought to have better ways of looking at our water quality than just by guess and by golly.

So we did begin to do some testing, originally for fecal coliforms for just health reasons. But then it began to evolve towards testing of the culprit of why our water is bad looking, and that is the algae is fed by phosphorus, which is a fertilizer just like you make your lawn green. So we wanted to evaluate the amount of phosphorus in our lake, and phosphorus tests in those days were less sophisticated than they are now, but it would take us up to 30 days at the lab; we would purchase a lab analysis.

Then in addition to phosphorus we began to test for chlorophyll, and we would test the pH, and we would test the oxygenation. In some cases we tested for nitrogen and the fecals also.

But the cost of having these independent labs look at this information and give it back to us was high, and it would take 30

days to get. Well, by that time the immediacy of treatment was not available to us. So we began on our own to do some testing, and about five years ago during the summer months we began to employ interns. These are graduate students at limnology schools across the nation.

M.O'R.: Right. We talked a little bit about them.

D.B.: They had been trained and they knew how to do the testing. So we began to acquire at first rudimentary equipment so we could begin to test on our own, and each one that would come in would say, "Oh, well, it would be easier if I had this additional piece of equipment," and it was only $1,000 or $2,000. So while we at first had reluctance, one by one we began to pick up the equipment so that right now we have a pretty well-equipped lab for water testing. I wouldn't say it's state-of-the-art in terms of speed, but it's state-of-the-art in terms of accuracy.

We also have a machine which is called a Y.S.I. - happens to be the name of the manufacturer, and I'm sure it's a predecessor to much more sophisticated equipment, but it tests for six or seven different water quality aspects with some electronic probes. So we can actually take it out in the boat. We know an exact location where we do our testing on a regular basis. We drop that over the side, and we can then electronically record the quality of water, and we come back, plug that into our computer, and we can then get printouts, and we've been doing some of that. So our lab, in addition to the Y.S.I. doing electronic testing, is pretty good. We can get information in one day instead of 30 days, and the equipment has probably paid for itself with the amount of testing that we're now doing.

M.O'R.: Now, is it used only in the summertime by your interns, or do you actually use it for year-round monitoring?

D.B.: It's used primarily by our interns, although there are several members of the board and the water quality committee who know how to use some of the equipment, and it would be my hope that over time we'd be able to do more of it in-house. But it does take some specialized knowledge and specialized training, so it's usually the interns who do the work. It's pretty sophisticated stuff.

M.O'R.: You said that when you sent the water out for testing at other independent labs, that you'd have this 30-day turnaround and that it would be too late then to do anything about the results. So does that mean that you would actually react in some way to this data?

D.B.: Oh, yes. Now we can react with the application of chemicals or the withholding of chemicals or maybe the kind of water - whether or not we want to take water from the Tualatin, or it's also a good prediction factor because it can predict trends. So if we see the algae bloom coming on, we can kind of know what's going to be happening in three or four days or a week because we can measure these trends.

It's a good tool for measurement purposes, and I'm sure it will become more sophisticated not only as devices measuring accuracy are more sophisticated, but also as the science advances and the experts can tell us under given conditions what is the application you should be considering.

M.O'R.: This is sort of anecdotal, I haven't been able to check it out in any old newspapers or anything, but someone else I was interviewing told me that they had looked up some things in some Lake Oswego newspapers from the 30's or 40's, I believe, that indicated that there was at least the perception of a problem associated with the lake water, a perception that there was a risk of contracting polio as a result of pollution from the lake and

that certain people even called it "Lake Polio." Do you remember anything at all about that?

D.B.: I've never heard anything at all to that effect, no.

M.O'R.: Okay. I only heard it from this one source, but I was wondering ...

D.B.: Yeah, it would seem to me that that is extremely unlikely considering the nature of polio.

M.O'R.: Okay. I was just throwing that out to see if it was anything that you'd heard of.

D.B.: Yeah, I've never heard anything about that.

M.O'R.: Okay. Well, as I say, the one subject we haven't talked about is the flood, last year's flood, the flood of 1996. I don't know exactly where to start that conversation, but maybe I could ask you when you first became aware that you were going to have a problem here?

D.B.: Well, that's easy. It was Monday before - the peak of the flood was Saturday morning at 1:00 a.m. But on Monday ...

M.O'R.: The previous Monday?

D.B.: The Monday prior to the flood, I received a telephone call from the lake warden, who said that he had received a telephone call from the Water Master on the Tualatin, and the Water Master was predicting that with the snow melt and the rain that was forecast, it looked like the Tualatin would be rising to flood levels. Now, the Tualatin typically runs about 102 in the summer months and maybe up to 105 or -6 in the winter months, and this is elevation above sea level.

M.O'R.: In inches?

D.B.: In feet. Feet above sea level. It was running, let's say, 106. I don't know the exact number - we could look it up - but I think it was in that range. And they predicted that it would be rising because of the combination of - what had happened was

there had been pretty much a saturation of the hillsides and so forth from rain, and then it had frozen, and so the precipitation continued, and it put down a very deep snowpack in the Coast Range. And then what happened is a kind of a - I think they call it the "Pineapple Express," the weather warmed up and it got even more rainy, and so the warm rain was falling upon the snow, which was on top of frozen ground. So the water couldn't go into the ground because the ground was frozen. So not only were we getting the rain on top of all the previous rain, but it was also melting the snowpack. So that I don't know the statistics, but if you get an inch of rain you are also getting a couple of inches of snow melt, so the volume of water - the velocity of water coming off the ground was very, very high.

But anyway, on Monday we got the notice that it might reach higher levels. So I asked the lake warden, I said, "Well, what are we doing?" And what we did is we immediately opened up our main dam for the lake to try to drain the lake as much as we could. We also closed off our headgate up on the Tualatin entirely so that we stopped the water from coming into the lake and we increased exit capacity at the dam. Then each day we waited, and what happened was the Tualatin began to rise and our lake began to lower.

The other thing we did is we immediately gave notice to the main canal residents that there was some risk of flooding, and they should take appropriate action. We began to stay close with the Water Master, and on Tuesday the rain was even higher than it had been on Monday, and the river began to rise.

By Wednesday, it was very clear that we were going to have an overtopping, and that this was not just a hundred-year flood, this was going to be something fairly significant. By Thursday, the overtopping of our headgate had begun. The lake was down at this point by about two-and-a-half feet.

Then within a very short time there was so much water coming in that the little bit that we had been able to lower the lake, even though we were discharging every drop of water we could get, the lake began to rise, and it came up through the two-and-a-half feet; we probably bought ourselves four or five hours by having the lake down like that. But then it just kept right on rising, and we couldn't get rid of the water fast enough.

The City of Lake Oswego was involved by this time. There had been additional notices to shareholders about the rises. The television services were picking up on the terrible flood fight that the City of Portland was having, but on Friday the focus began to be here because Portland was not going to suffer, as it turns out. In Portland along the sea wall they tied up, I believe, 2,000 sandbags along the waterfront. Here in Lake Oswego we tied over 100,000 sandbags, and people had been working all of Thursday night, and then on Friday night they were also working - at its peak, which was at 1:00 a.m. on Saturday morning, the river had gone now above our headgate, which is 113.6 feet above sea level, to reach its peak at 1:00 a.m. Saturday of 120.1 feet. So it was overtopping our headgate by about seven feet, and the volume of water coming in was 100 times our normal take. And by that I mean normally we take in about 50 cubic feet per second, 50 cfs, but at its peak we were taking in 5100 cfs, and it was coming - two-thirds of that was coming over our headgate, and another third was coming overland from upstream on the Tualatin through a kind of a saddle that is known as the Bryant Woods Gap through the community of River Grove.

Almost every house on the main canal was flooded at this point in time. The water in some of those areas was traveling about 15 miles an hour, it was maybe 10, 12 feet higher than it would normally run. It completely inundated every boathouse, and it was

- I mean, we had a real mess on our hands. It was a miracle, in my opinion, that nobody got killed, and to my knowledge I don't think even there was a sprained ankle.

There were individual's trucks and National Guard trucks and people, volunteers everywhere. In fact, here at our own structure the National Guard was here, and there were prisoners. There was a prisoner truck that came in, and I remember when the prisoner truck came in they said, "How can you use these people?" These were young men; I think they were actually excited to work if they could, but the police guard said, "No, no. They have to stay in a group." So we put them to work moving sandbags and so forth, and I remember when they had to leave - they had counted on the way in, there was 13 of them, and then they counted on the way out and there was 12. And the police sergeant just turned to me, and he said, "Well, it's not too bad; we only lost one. So if you see someone hiding under a bridge, you know, give us a call." I have no idea who was the person who was missing, but somehow he escaped in the crowd.

M.O'R.: These were people from which facility; do you know?

D.B.: These were young men from, I think, the Donald Long Juvenile Home, and I think they were mostly fellows 18, 19, 20-year-old guys. I spoke with several of them as we were working. I mean, I thought they were pretty nice fellows, and they were certainly anxious to work if directed, but it was a little tricky because they had to stay under the watchful eye of the police escort. But in an environment where trucks were going this way and that, and there were bulldozers and cats and cranes and people dropping off sandbags and onlookers and television crews - I mean, it was - police trying to direct traffic and keeping out the people who were just gawking at what was going on and letting in the volunteers who truly wanted to work. And of course it was pouring

down rain this whole time, and we didn't know when it would stop. The Tualatin really flashed up on us.

But anyway, I was in this building at 11:30 at night. My daughter and I had brought pizza in, and the Water Master was here because his office had been flooded out, and he was working on our computers, tying into his database up and down the Tualatin.

M.O'R.: So this office was never inundated, then?

D.B.: No, we're on the second floor of a boathouse now, and right now we're probably about 12 feet off the water. But our lake surcharged four-and-a-half feet of that 12, so we had to remove everything from downstairs, including our water quality lab. We had our boats out in the lake, and they couldn't be tied to docks because the docks were under water. It was kind of tricky at the time. And of course the water was pouring over the top of our dam, not just the spillways, but physically over the top of the dam.

Just prior to that we had made a couple of decisions. One, we decided to cut through our flume line. You may know that the powerhouse that we have is down near the Willamette River, and it was under water so much so that we were fighting to save it. We did save it, as a matter of fact. It was very touch and go, but we did save it, and we prevented the water from coming in the windows, which are like 20 feet up from the normal level of the river.

But the water was so high that we couldn't run our power generation system and expel water into the river. It would actually back up through the system. So we had to shut off our flume lines down - or our pen stocks down from this lake down to our powerhouse. And Stuart Dunis, who is our maintenance supervisor, took a chainsaw to that grand old flume line of ours, which had been in place since probably 1910 - it's a wooden, redwood, center-cut flume line - and we removed some straps just at the dam area, and he took a chainsaw and sawed through the flume line,

which broke my heart because my goal is to - and his - our goal is to protect our assets, and here we were with a chainsaw sawing right through a flume line that we had protected for almost a hundred years. But we had to get water out of the lake.

M.O'R.: So you severed the line so it no longer ...

D.B.: We severed the line because we could no longer use it to put water into the powerhouse because the powerhouse was shut down. And then the moment it was severed, we then opened up the flume line again, and we were able to expel an additional 360 cubic feet per second.

M.O'R.: Then it just dumped into the creek?

D.B.: And it dumped into the creek, which in turn dumped into the Willamette River. And we had all of our stop logs out. We were doing everything we could to get rid of water. We could not get rid of it fast enough.

In retrospect if I had to do anything different I would probably immediately get someone who knew something about photography and just say, "Here's 20 rolls of film; you go around and record this on film," because a lot of things were happening really fast, and with the kinds of things I was doing it was almost inappropriate to carry a camera because it appeared more as if I was a gawker than, you know, trying to manage this thing.

There were a lot of - I wouldn't say life-threatening heroics, but there were a lot of heroics going on in terms of people volunteering. This whole community really pulled together.

So Saturday morning, when we got up, the rains had passed. It was a high-pressure environment with clear blue sky, and you would look up and see what a wonderful day, and then you would look down to where the water was, and it hadn't receded fully yet. I mean, there was water everywhere on the ground. But the Tualatin was beginning to come back down again. It kind of went up and back

down again on a bell curve, with a longer lead time on the back side than the front side. The front of the curve of coming up was much steeper.

One of the reasons that the Corps of Engineers talked to us about was that the Tualatin Valley has had so much development in the last 100 years that there is more and more impervious surfaces. By that I mean it's always wonderful news when someone announces they're going to build another factory or electronics plant or industrial building, but the difficulty is then that the area that that building encompasses can no longer - the ground can no longer receive water. So the water hits the impervious surface of the roof, and then it runs off to the side and is directed into a stream or a corridor of some kind. But it isn't just the factory. Also leading up to the factory there's a parking lot and a little driveway that also won't receive water any longer, and then to supply that there's a road system, and there's not just one factory, but many factories. Then there's all of the people that move into Washington County and they build houses, and the area of the house and the driveway won't receive water, and it's all got to go into stream corridors. And it isn't just those two factors, it's also then the retail, the huge parking lots for retail operations and so forth, and a lot of those projects are best built on the flat portions of the valley, which are usually the areas near flood plains. So we don't have the flood plains to absorb the water like we used to, and as a result when the Tualatin comes up it comes up much faster today than it did historically, and that trend will probably continue. Fifty years from now, unless we come up with some good ideas, the Tualatin floods will occur in a much steeper slope than they have in the past.

But in this case, on top of all that we just had too much water and this combination of frozen ground, melting snow and the Pineapple Express.

So anyway, the water began to recede. By Sunday afternoon it was once again below the level of our headgate, so for us we then quickly were able to drop the level point back down to normal operating levels. We intentionally did not take it any lower right away, and the reason was that the side slopes were highly charged with water; they call it a hydrostatic condition. So the slopes around our lake were all hydrostatically charged, and we wanted to give them time to dry out before we then began, in about 30 days, to lower the lake gradually, which in 30 days we began to, and we brought it down to nine-and-a-half feet below its normal operating level, which would be about 14 feet below the peak of the flood.

At that point in time, then, the Lake Corporation mounted its major efforts to restore its system. And what we did, Michael, was - well, the first thing we announced to everybody is, "We want you off the lake. We don't have the ability to patrol the lake." I mean, we were just knocked out, and we told everybody to stay off the lake.

We identified our priorities, the first priority being anything to do with fire, life, safety issues, that's what we would address first, and we were prepared to do so. Then it went down through debris clearance, hazardous materials. When we lowered the lake, we then began - we had already taken off the surface debris; when we lowered the lake we then began the clearance of siltation that had come in and underwater debris.

During this time we actually picked out 32 sunken boats around the lake, locating some of them with a sonar system, and others that sunk in shallow water that maybe one end of the boat was just

above the water. We accounted for all the lost boats within the first 30 days. We got them all out.

M.O'R.: And found who owned them?

D.B.: Yeah, we found who owned them, you know, off their tags and so forth and people claiming them, and some of them were completely destroyed and some partially destroyed, but most probably two-thirds of their value was gone because of what had happened to them. Got all those fuel tanks out of the lake. We were very concerned about leaking fuel. It was expensive, but we had these barges on the lake removing the debris. We didn't have any place to take it to a roadway, so we actually went in over what's known as the Alder Point Club easement, got their permission to do that, and we took out 72 40-foot drop boxes of surface debris off that location.

Then we got the lake down to nine-and-a-half feet below its normal level. We then began our siltation removal project, and we actually removed about 30,000 cubic yards of material. We've cleared out the main canal, which actually didn't have very much material in it. It was mostly scoured out. So the silt that had been there before the flood that we were worried about how to get it out, I mean, it was gone.

But the sewer lines were exposed, so the City had requested that we build a road up through the sewer line, or above the sewer line, and we then were able to allow the City to repair its sewer lines down through the main canal. We also dredged to Blue Heron Canal. We dredged a little area in between the two called Key Lock Bay, but most of the material came right out of the main lake near the entrance to the canal.

We ran something like 3200 trucks full of silt over to a place called the Durham Pits. A long haul, but it was the closest location we could find that could take that amount of siltation.

Then when they were done with that, which was probably now the end of May, they left the job site and we began the refill operation. We were still using our old original headgate, and interestingly enough it was damaged and compromised during the storm event, but it did hold. Then in the ensuing period we discovered we could get it back in operation again, and actually it was running just fine, but we did not want to take a chance on it on a long-range basis. So what we did was to employ an engineering firm to design us a new headgate, which they did, to the higher levels I talked about. We couldn't get the public permits to built it that way, so we are just completing our construction now of a new headgate, same location. It will 113.6 feet high.

M.O'R.: That was the height of the old one, as well?

D.B.: Same height as the old one, and if the law changes, we can add on to it, but right now the law isn't changed, so that's all the higher we can go.

[End of Tape 5, Side 1]

M.O'R.: So you can't get permission to build a higher headgate?

D.B.: No. The city regulations and the FEMA regulations prohibit that. Our long-range projection is that the headgate will be overtopped approximately every five years. We don't know the exact times and heights it's going to overtop, but we believe there was an overtopping in 1933, there was one in 1964, and there were two more during the 70's and two during the 80's. So there's five or six overtoppings that we know about. The lake has previously surcharged, but never to this height. We have some - a lot of people have called this the 200-year flood. Some people who have interpolated the curve and tried to be more exact are saying that it's the 225-year flood. Well, I don't know.

But floods are very interesting in that it's like you have a bag of marbles with, say, 225 marbles in it, and every one of the marbles represents a probability of a flood occurring in that particular year. So in this case the marble that was drawn out was the 225-year flood, so it's one of 225 marbles. But interestingly enough, after the flood the marble goes back into the bag. So you have exactly the same chances of it happening next year as it did of happening this year, one in 225, except for the increasing probability of higher and higher floods due to the development in Washington County of the Tualatin area, the basin that it serves.

So my own feeling is that the probability of these events is going to increase, not decrease, and we're only betting if it happens once in every five years, which is the pattern for about the last 25 years, that it may begin to happen more often than once

in every five years. We know it's going to be overtopped and we're building our new headgate to accommodate that. It is an expensive structure for us, and we're not getting very much help from the federal government or anybody else. The shareholders here started out with about a half a million dollars in reserves. We doubled our assessments to the area of 750,000, and we've developed bank lines of credit as well as making a request for a Small Business Administration loan, which I understand has been approved and we should be funded shortly.

M.O'R.: You just got that news, then, today?

D.B.: We just got that news, yeah, as this interview was beginning, that the - a great comment, what they said was the check is in the mail, which is kind of a funny term in our times. But I must say that at this point in the history of our country the Small Business Administration performs extremely well. They are very demanding, they are very exact in terms of meeting their requirements, but once you do they can be very helpful, and they're being very helpful to us. They're going to allow us to preserve our system, to their credit.

M.O'R.: When you say that you're going to build the new headgate and you'll be ready for the next flood, if it's at the same height, though, as the previous headgate, then how will it help?

D.B.: That's an interesting question. Well, one of the concerns we had is that the previous headgate would fail.

M.O'R.: And wash out entirely?

D.B.: And wash out entirely, and then we would have had a real mess on our hands because not only would it - I mean, the overtopping of seven feet was bad enough, but if it had destroyed the underlying 15 feet, the volume of water coming through there would have been three times, and then the velocity of the water

coming through there on that kind of a sandy loam base, who knows what kind of a channel it would have cut?

M.O'R.: Plus even when the water dropped, it would have to drop even further before it would stop flowing into the lake?

D.B.: The risk of that was so great that the Corps of Engineers, who were on the site, made a determination on Saturday night, the day after the peak in the flood - they had debated it all day long, but Saturday night at 11 o'clock they determined that they would add an additional margin of safety, and so approximately 200 feet down from our existing headgate, opposite what's known as West Road, the Corps decided that they would put in a rock and sheet pile dam, and by that I mean they would dump large rocks into the canal and then face the upstream side with sheetrock and then dump smaller gravels in up against the sheetrock so that in case the headgate failed, there would still be that downstream structure that would serve the place of what the headgate should have done. That it was like a backup headgate.

I was involved in those discussions. Joe Russell was the head of the Corps at that time here in this area. Quiet guy, but with a tremendous determination to get things done. The decision was made at approximately 11 o'clock on Saturday night - that would be the - I think it was the 9th - but anyway, the flood had peaked Saturday morning at 1:00 a.m.; well, this is 11 o'clock the following night, and all of us were a little numb by that hour, but the decision was made to go, and Joe Russell picked up his cellular phone and he made one phone call, and within an hour activity was beginning at the site.

What they had done is they had mounted a dam-building effort. They had sent trucks up to the Camus Quarry, which was the unique kind of rock that they needed, Camus, Washington. Trucks were being loaded. They drove them from Camus down to Lake Oswego, and

they were able then to dump them in the Bryant Park parking lot, and then with smaller trucks they would load the rocks onto the trucks and drive the trucks up the canal road and dump them into the canal. By Sunday morning, about nine hours later, that structure was complete and they were driving sheet pile on the face of it. It was the most amazing engineering feat I've seen. I mean, we're trying to build a headgate, and it's taken us six months to design it and get the permits and to go through all of the things we have to do to get our structure up. But the Corps of Engineers did that in half a day, from the planning stage to the completion stage. I mean, it was amazing. It was a lesson to me of the power of the U.S. Government when they want to do something. I've only seen one other thing like that, and that was one time when Senator Hatfield of this state made a decision on a particular item, and to see how fast when the government wants to move it can move. Very impressive.

M.O'R.: What was the Hatfield incident?

D.B.: Oh, well, it was another completely unrelated incident, but just by way of illustration, senior people in government when a need arises for fire, life, safety protections, the speed that they can move and set up things. I mean, it was a wonderful feeling to see that our government had these kinds of capabilities. You never think about; when there's no flood, you never think about the Corps of Engineers. But on the day of the flood, these guys can really turn to.

They may not think about the environment very much, but they sure can build structures.

M.O'R.: Of course, it doesn't sound like a terribly sophisticated structure, though?

D.B.: No, but it would do the job that was required.

M.O'R.: Now, you said it was backed with sheetrock; you're talking about just regular construction material used in ...

M.O'R.: Well, the sheetrock that I'm talking about is - these are pieces of steel that are probably two feet wide, and they look like an elongated S, and they're maybe 50, 60 feet long. They have a crane, and they grab one end of them, and then it hangs down and they press it into the ground at the area where they're going to build the wall, and they then begin to hammer it into the ground, or vibrate it into the ground, and each one interlocks with the one adjacent to it.

So they have tremendous strength, and when they build these things, they first of all dump the rock downstream, and then they put the sheetrock upstream of the - I mean, the sheet pile, the steel sheet pile, upstream of the rock buffer behind it or braced behind it. Then they fill in the area between the sheet pile and the larger rock with small rock. So that the water would press against one side, but all the rock is on the other side. They have tremendous strength. They last for a long time.

We had a discussion with them about the flood receding and didn't feel the need to complete the structure. It would have buttoned up our canal, as one of the engineers said, "So tight you wouldn't be able to flush a toilet with the water going through there." And then when the Corps is done, the trucks drive off, and we own the structure. We own the rock, we own the structure that's left there. I mean, they're gone, but the structure remains.

Then at that point an organization of the federal government called FEMA, the Federal Emergency Management Administration, comes forward and tries to protect and to assist the citizens in their recovery efforts. FEMA has a grant program that we thought we were eligible for, and then they have a loan program through the Small Business Administration. As it turns out, on the grant program

they're very generous to governmental agencies, but even though in our opinion we qualified for eligibility, they are unaccustomed to providing money to not-for-profit organizations such as ourselves, and they have been very restrictive, more so than we think was ever the intent of Congress. But we've not been successful in convincing them otherwise.

M.O'R.: So you had to go to the loan side of their ...

D.B.: So we had to go to the loan side, and to the credit of the Small Business Administration, they are very effective right now. They've got great systems.

M.O'R.: Now, that dam, I assume that became a liability after the flood waters receded?

D.B.: Well, it did provide an added measure of protection, especially during the flooding season. It was never used, but it was there.

M.O'R.: But you had to remove it later, didn't you?

D.B.: Then what we did was go in there with large equipment, and rock by rock we lifted them out of there. Most of the rock that was put in still remains, but it's on the sides of the canal now; we've removed it from the center so we can get flow through to restore the lake.

Then what happened was the lake was drained during the month of May. In March we held it high, in May we drained it. We did our removal of siltation, and then we opened up the old headgate to bring water in from the Tualatin to bring our water levels back up again.

M.O'R.: You drained the lake all the way?

D.B.: We drained it down to nine-and-a-half feet. The lake typically runs about 98.6 feet above sea level, or as high as 98.8 and as low as maybe 98.2 is what we call our navigation range. We operate in that range to this day, and we do not intend to - about

every other year we drop it so people can work on their sea walls and the City can inspect its sewer systems, but we're not going to drop it this year. We'll just run another year with it up.

But when the lake was down we took the silt out, did a lot of repairs, lots of repairs to sea walls. The City did its repairs to the sewers, and then we filled it up again. We had a wonderful recreation season for the remainder of the year.

Then we started the headgate construction about mid-October, and right now we're about 50 percent done with our headgate, and we anticipate testing it in mid-December, and it will be completed by the end of the year. But it will be so strong that we can withstand the overtoppings that are projected for the area.

M.O'R.: Sounds like quite a year.

D.B.: Yeah. We're kind of winding it up now.

M.O'R.: Do you have any sense of what the total dollar amount was that was required to restore the lake?

D.B.: Well, I do. We've been pretty closed-mouthed about it, but I guess this is for historical reasons, and I guess I don't mind sharing it. We've been pretty closed-mouthed because as a private not-for-profit organization we tend to be very close with our financial information, but let me just kind of share with you that we're probably going to approach $1,900,000.

Our sources of that are 550,000 which were our reserves at the beginning of the year, another 700,000 which was our assessments because we doubled our assessments around the lake to help pay for this, and the final amounts would be from borrowing. We established lines of credit at the Wells Fargo Bank specifically to pay for these things, and what will happen now, we will draw the funds from the SBA, pay off our bank lines of credit, and use the SBA loan to complete the headgate restoration. I anticipate that we'll pretty close to zero out our cash position by the time of our 1997

assessments. When they come in next year, my expectation is we'll use about half of that to run the operation for the year, and the other half will begin to rebuild our reserves, and in my opinion it will take at least two years for us to get back to the position we were in before as far as reserves go, but of course that doesn't include the SBA loan that we now own, which will be around 900,000.

Our expenses, item by item, just in rough numbers are: We've got maybe $300,000 into our parking lot. We've got maybe 550,000 into the silt removal. We've got maybe 75,000 into the surface debris removal. That surface debris was hauled out over the Alder Point Easement. That probably cost us 45,000 to restore that easement. Our dam and powerhouse are probably in the area of maybe $100,000. We probably took a hit of 6- or 7,000 on our main office, and another 6- or 7,000 on the marina. The headgate is maybe 700,000. Then we have another maybe $8,000 on the diversion dam to replace the flaps that were blown out.

So it all adds up, and there's always a lot of little incidental expenses. There's some, you know, labor and overhead costs that you don't know exactly how to allocate, and there's a tremendous interruption in what we're trying to accomplish here. We brought in a lot of dirty water, and we've always taken pride that we try to keep the lake pretty pristine, but it will take us a number of years to get that quality of water in our lake restored.

M.O'R.: On that point, in a typical year is the quality of water higher or lower in the wintertime versus summertime?

D.B.: The quality of water would normally be higher in the wintertime, but it appears much higher in the wintertime, and the reason is that most of the algae species that we have tend to thrive in warmer water. We do have some cold-water species as well, especially in the fall when there's a change in the temperature, there's a big bloom that happens in the fall, but then as the

water gets even colder, that dies off. There are hundreds and hundreds of kinds of algae. Someone told me there are 5- or 600, and someone else has said maybe several thousand. But we have a strain of algae that does very well in the fall here. Makes a real mess as far as visually goes.

Then when winter comes on, it isn't so much that the water is better quality, but the water is colder, and when it's colder there are fewer species that survive.

M.O'R.: I see.

D.B.: So it's also more clear in the wintertime because of that.

M.O'R.: You mentioned also repairs to your generation facility. Did that include the line that was severed with the chainsaw?

D.B.: Yes. We did repairs to our powerhouse. We had to wrap some coils, and when the water got in there we had to dry everything out and heat it and kind of toast it to make sure it was really dry. We have run the powerhouse since, and it does work. Our flume line, what we did below the area where we had to cut it was we installed what we call a bifurcation valve or a Y-valve so that in the future when the waters get this high, we won't have to take a chainsaw to it. What we do is we open the Y-valve, and then the water can exit off to the side of the valve without having to cut it. That bifurcation is expensive, but we feel that it's a worthy investment.

M.O'R.: It sounds like the previous structure was historic in nature in terms of its building materials, et cetera. Is any of that preserved, or did you have to replace it all?

D.B.: In terms of preservation, no, what happened is when we cut that line there was a lot of stuff going on and we just made the cut, but then the flood carried everything away. I don't even know where those old pieces are. Those pieces of wood, though,

that later on we went in and took out when we did the match in that area down there, it's very interesting, there is about an eighth inch of rock on each side that, you know, is kind of slimy and punky and so forth, but the inside of that wood is just as clear as a bell. And some of that wood is 80-some years old, close to 90 years old, and it's very high-quality wood. You just need to plane off the outer edges, and it's center-cut no-knot redwood. Nice stuff.

M.O'R.: Stuff you can't get anymore, probably.

D.B.: Yeah, you just can't buy that stuff anymore. That's true.

M.O'R.: Were you sort of the person in charge here at the Lake Corporation in terms of managing the flood?

D.B.: What happened during the flood is the members of our board, our entire staff, and people who lived around the lake all pitched in, and there was a tremendous spirit of camaraderie, and everybody was trying to help. But as the emergency nature wore off, my particular activities at the time allowed me a little more freedom to spend some additional time. So in discussions with our staff and our board, it was decided that the unique nature of restoring the lake was above and beyond our normal management requirements, and they asked if I would assist during that transition, so the answer is yes, I did kind of get drafted into the position.

Interestingly enough, in today's world there was a lot of public relations that was involved, much more than I thought, where people whose lives had been shattered by the flood, they had lost in some cases several hundreds of thousands of dollars, uninsured because they didn't have flood insurance, and there was a lot of anger and frustration. There was a lot of finger pointing about whose fault was all of this.

As it turns out, I think all the observers have attributed the fault to, well, that's just the way nature is. But there were a lot of attempts to find blame, so it was necessary to address all of the issues that were arising, and I think to the credit of people in this community, to my knowledge there's not been a single lawsuit filed against any party as a result of this flood. It's viewed as an act of God in the legal parlance.

I think that one of the advantages of having a centralized place in the organization to handle the flood was to convince people that there wasn't really much of a human error here, it was more this is just what Nature does from time to time.

M.O'R.: And people just made the best decisions they could.

D.B.: And people made the best decisions they knew how to make. Someone told me in a crisis like this if 70 percent of your decisions are the right decisions, you're probably doing pretty good. My guess is that we probably hit that number. I know of a couple of decisions that we probably wish we hadn't made, but in the main the decisions were good ones. I think that cutting the flume line was probably one of the best decisions of the whole flood because we could expel so much water so fast. And I think in terms of hazard mitigation, the things we're doing afterwards, putting that bifurcation in there is probably one of the best ideas we've got, because instead of being down two-and-a-half feet, we might have been down five or six feet by the time the flood hit had we had the bifurcation capability.

M.O'R.: When you drew the level down as a result of the advance warning you had, were you drawing it down as rapidly as you could?

D.B.: Yeah. We were flat out. We were dumping everything we could, and there were just no more ways we could get rid of water. Chuck Schaeffer, our lake warden, he and I were out there and we

were watching the water coming over and so forth, and he just lamented the fact that - he says, "I don't know how to get rid of any more water." I mean, we were like tempted to use a dipstick to reach in one side and throw it over the dam on the other. But no, we just did not - we talked about ideas - this is going to sound strange, but we were searching for ideas, and one of the ideas that we actually discussed was the idea of dynamiting the main dam. I mean, it was an idea where we were in an environment where we wanted to look at every possibility, and of course it was rejected. The idea of dynamiting the main dam would have been a disaster for the City of Portland, who were fighting their own flood fight, and if we had thrown that much water at them that fast - and plus the fact that the timing of dynamiting it was actually as the water was coming up and we knew it was going to overtop, or we thought it was. Well, suppose we had dynamited the dam, and then it didn't overtop. I mean, that would have been a million-and-a-half dollar mistake.

M.O'R.: That's about what it would cost to rebuild the dam?

D.B.: Well, who knows? That's just a number I'm throwing at you. But it's probably in the realm of reason, a million-and-a-half dollars, maybe more with all the earthquake aspects that you've got to go through today to get something like that built.

M.O'R.: But that figure obviously - since you said you're into it about 1.9 million in restoration, obviously that means ...

D.B.: You would have added that much more.

M.O'R.: Well, yeah, but it also becomes an option you might want to look at because it's in the same ballpark ...

D.B.: No, no. I think that the correct method is to think through how you can expel more water before the flood hits, build your facilities so that when the flood hits you can use those facilities.

M.O'R.: And that's what the Y-valve will do for you now?

D.B.: Well, it's a contributor. After all, we think we can expel somewhere around 2400 cubic feet per second, but the water was coming in at 5100 cubic feet per second, so that was a two-to-one ratio. Well, that 2400 cfs will be expanded by maybe another 360. So it will be up to maybe - what? - 2750. So we're still 1500 cubic feet per second with no place to go. So then it's a matter of duration. At least what the Y-valve does is it will give us a lower level at the start of the overtopping. It will close the gap between input and output.

[End of Tape 5, Side 2]