

Colorado River Water Users Association –NEVADA
TAPE #1
KAY BROTHERS (Tape #1)
ORAL HISTORY INTERVIEW
December 12, 2007

kb – Kay Brothers

ps - interviewer Pam Stevenson, Agave Productions, Inc

bs - videographer Bill Stevenson

ps I'll start off by identifying on the tape that today is Wednesday, December 12th, 2007. And we're here in Las Vegas, Nevada, at the Southern Nevada Water Authority Building. I'm Pam Stevenson doing the interview. And Bill Stevenson is our videographer. And, these are for the Colorado River Water Users Association Oral Histories. And, I'd like for you to give us your name.

kb Kay Brothers.

ps Tell me about...when and where you were born?

kb I was born in Farmington, New Mexico, in 1954.

ps Did you grow up there?

kb Yes, I grew up in Farmington. I went to, uh, the University of New Mexico for a few years. And, when I finished, I received my degree from, uh, New Mexico Institute of Mining and Technology in Socorro, New Mexico.

ps And, growing, did you grow up in a rural situation? What did your parents do?

kb No. My father was a banker and my mother was a librarian for a... elementary school. Farmington was a small town, mainly apple farms, and oil and gas. Probably, at the time I was growing up, it was 20 to 30-thousand people. It's now probably about 50,000 people.

It's on three rivers that come together. The San Juan, the Animas and the La Plata. And, it's known as Totah, in Navajo, cause it's right next to the Navajo Nation.

ps Farmington, you think everyone's a farmer. But your parents weren't...

kb (laughs) Apple farmers. There were a few. Yes.

ps So, growing up, did you have thoughts of what you wanted to be?

kb I wanted to be an architect. And, as I went through...well, actually, an artist, and then I decided, because my father told me that I couldn't. make a living being an artist, that I needed to be an architect. So, I went to the University of New Mexico to, to study architecture. And...Fortunately, I was very good in math, so I took quite a bit of math

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and physics. And then just kind of migrated to engineering. Environmental Engineering is what I received my degree in, in 1977.

ps And so, when you graduated then, what was your ideas about getting a job?

kb Well, I had a job when I graduated, with Phillips Petroleum, in Bartlesville, Oklahoma. They had come to the campus and interviewed...a number of oil companies did. And, I chose to go with Phillips. And I was with the water section of the Environmental Department in Bartlesville.

And, did a lot of wastewater treatment design for oil refineries. For petro-chemical plants. Off-shore rigs. Things like that. So, that's how I started in 1977.

ps So, did you do a lot of traveling?

kb Yes, we traveled to the various plants, cause Bartlesville was the home office for Phillips. And, there were many plants that we'd travel to do certain work. In the south, of course, products plants. Meridian, Mississippi. Mobile, Alabama. So, traveled a lot in the southeast, as well as the mid-west with Phillips.

ps How long did you work for Phillips?

kb Well, three years. I ended up going out to Albuquerque in the uranium. They were sinking a shaft, near Crown Point, New Mexico, for uranium mining. And, I went out there to design some wastewater treatment facilities. And, then, after the uranium industry had kind of cratered there, I went to work for Kerr-McGee Corporation in Oklahoma City, and did about the same thing. I did a lot of wastewater treatment design for various chemical plants there.

ps Did you continue to work on uranium mining?

kb A little bit, yes. As well as a lot of chemical plants. That's how I really got to Southern Nevada. The Kerr-McGee facility is out in Henderson, Nevada, and, I was sent out there for about a, planned to be about a year to work on the groundwater issues, the contamination issues out there. And, decided that I didn't want to go back to Oklahoma. So, that's how I ended up, with taking a job with the Las Vegas Valley Water District in 1986.

ps When you were working with Kerr McGee waste water at Churchrock, were you there when there was a spill of radioactive water into the Puerco River?

kb Yes, I'm very aware of that. We did some sampling from that. After that. And a lot of areas around that. We did quite a bit of water quality sampling. So, I was, I was aware of that. I was with Phillips at the time that happened. Phillips Petroleum.

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ps I did a news story about that (kb – Is that right?) I was up there doing interviews with the Navajos. (kb – Yes. Yes.) That was a huge issue.

kb Hm, hmm. It was a very large issue. Yeah, small world, isn't it? (laughter)

ps I actually, went into the Kerr-McGee mine at Church Rock and was filming there.

kb That was before I was working with Kerr-McGee. But, I was with Phillips, and I was in, in New Mexico at the time that that did occur. Yeah.

ps We had to get permission to go in...with a TV camera....into the underground uranium mine. (laughs)

kb Pretty exciting stuff, isn't it? Is it pretty interesting down there? Yeah.

ps Yeah, once was enough! (laughter) So, you came to Nevada, then, working with Kerr-McGee?

kb Yes. And I came in 1984, 1985, to do, again, some work on the...there was a, a contamination plume that...it was coming from the Kerr-McGee facilities. And, doing some work on defining that and designing a, a wastewater treatment plant to capture that and treat that. And, again, that's when I was here.

And, I, of course, born and raised in the West, and I like the West, and so, decided to, uh, stay here. And so, that's when I looked for another job.

And I went to work for Clark County, uh, in 1984. And then, I worked for about...a little over a year with Clark County, and then I went to Las Vegas Valley Water District. In 1986.

ps And, what was your first job?

kb Hydrologist. I was a hydrologist for the newly-formed Research Department for the Las Vegas Valley Water District.

So, again, the ground water background, and I did groundwater modeling, all that background was, uh, why I got the job with the Water District in, in the 80s.

ps As an hydrologist what were you doing?

kb We started looking at the possibility of putting treated Colorado River Water down...injecting it into the groundwater system. Or, doing artificial re-charge. We started that in the late 1980s.

We also were doing an assessment of the groundwater basins in Eastern and Central Nevada. That led to us, in 1989, filing over 140 applications for un-appropriated groundwater. Any stream in Central Nevada that now we're moving forward with the State Engineer's process right now, in developing what we're calling the Clark, Lincoln

and White Pine Groundwater Project. So, I was one of a few people that worked on filing those applications back in 1989.

So, again, we did a lot of the groundwater assessments. Looking at the availability of groundwater in Nevada. And then, one of the large projects was to evaluate whether it was possible to take treated Colorado River water just out of the regular distribution system. Take it through, and inject it back into the aquifer for future storage. And, that program now has become, I guess...it's the largest well injection program in the world. So, it worked. (laughs)

ps So, was that sort of groundbreaking and new things that people weren't...hadn't done before?

kb Well, they had done artificial recharge byas it's done in Arizona and other places...by taking it and putting it in spreading basins. Or putting it in, in large areas that percolated into the ground.

They had looked at injection through wells, much in the coastal areas for saltwater intrusion. Injecting water to keep saltwater back. So, that injection was something that was done. But, usually it wasn't done in the portable aquifer and trying to store it for future use. So, it was kind of a, a new approach at that particular time.

ps What is the advantage of injecting the water, as compared to the large open basins?

kb The geology is such here that if you put it in the spreading basins, you'll encounter clays or caliche that actually will divert it up to the surface, and not allow it to get into the groundwater system. So, that's why you have to use wells that actually go through that impervious layer and put it into, into the aquifer itself.

ps Is there concern about, though, the quality of the water being, the recharged water, contaminating the groundwater?

kb Well, the re-charged water is treated potable water. Treated...it's just...it's the water you would get if you opened your tap. So, it is treated and chlorinated. But there is, of course, concern that the water qualities would be compatible. You wouldn't get precipitation. You wouldn't get some type of calcium carbonate, or calcium sulfate formation. So, a lot of chemistry modeling was done to ensure that there was compatible...to be able to put the water into the groundwater system. So, that was, that was important to do before you did it on a large scale basis.

ps So how has all that worked?

kb It's worked well. We have stored in this Valley, over 300-thousand acre feet of water. So, we've done it since the late 1980s. The maximum that we have, I think, put in, in any particular one year, was a little over 30-thousand acre feet. So, when you think about how much Arizona injects, that's a very small amount. But, still, it's very important for

us. And it is in the groundwater system for our future use. So, it's something we do now if we have additional capacity, in our allocation. We do bring it in in the winter months. When it's not needed. And we have excess capacity in the distribution system, and put it into the aquifer.

ps For the archives, can you explain a little bit about how Southern Nevada gets its water?

kb It receives about...over 90-percent of its water from the Colorado River. We have two treatment plants and two intakes in Lake Mead. The first intake was installed in 1971, and it feeds the Alfred Merritt Smith Water Treatment Facility that's on the shores of Lake Mead. The second intake was operational in 2002. And, it feeds the River Mountain's Water Treatment Plant that's actually through the...on the other side of the River Mountains. In Henderson, Nevada.

So, those two treatment plants and intakes give us capacity of about 900-million gallons per day. So, that's treated Colorado River water. Conventional treatment. Filtration. Chlorination.

Then we do utilize some groundwater that's in the Las Vegas Valley. It is a closed basin. The State Engineer allowed no more permanent rights from...I think the last permanent rights were in the 1950s. So, you can't get additional permanent rights. But, we do, between our purveyors, the Las Vegas Valley Water District in North Las Vegas, we pump over, every year about over 40-thousand acre feet. So, a small amount of water, but it's mainly used in, in the summer to meet peak demands.

So, what we utilize for water, it's mainly Colorado River water and then a little bit of groundwater in the summer, to meet peak demand.

ps Historically, when people settled here were they using groundwater?

kb They were using in 1905, that is, in May 15th of 1905, is when Las Vegas...the land sale that the railroad, at the crossroads of Las Vegas, occurred. And at that time they were actually using spring water. There were natural springs in the Meadows area, which is where now the Las Vegas Valley Water District is. And, that water was transmitted through redwood pipes actually down to certain areas in Las Vegas. So, it was groundwater which was actually coming up in springs.

And, groundwater provided the majority of water until really 1971. A little bit of surface water was used in the 1940s for the war effort in Henderson. They had a facility that was built there to help make metals for the war effort. But, not until 1971 was there large importation of Colorado River Water into Las Vegas Valley.

ps Most cities are settled, it seems on a river somewhere. Historically speaking, that's not the case here?

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kb Well, it's the river. It's only 30 miles away. The Colorado. And then, it became a big lake in the 30s. (laughter)

ps Not right on the Colorado!

kb No, we're not right on the Colorado. Although we return our treated wastewater to Lake Mead and to the Colorado for all purposes. So, the lake kind of got the Colorado a little closer to us, in the river channels.

ps Some people might wonder, why did they ever settle there in the first place?

kb Well, the springs. Again, the springs. Then, it was known as the Meadows cause the grass was in the springs.

ps Well, looking back, which projects or legal development do you think prepared southern Nevada for becoming the place it is today?

kb Oh, I guess, I guess the legal development of allowing gambling and gaming probably did a little bit of that.

I think the Compact of 1922 was pretty interesting, because it did, uh...they thought, well, nobody would ever really live in Nevada. Because of the climate. Because you didn't really have much air conditioning then. And, there was no good farmland. So, who would ever think that that little place in the world would need more than 300-thousand acre feet of water? When Arizona got the two-point-eight million, and California got the four-point-four million, we got a very small part of water, and no agricultural base.

I think what you're seeing now happening is transfers from ag to urban is happening in, in Arizona and in California, but not in Nevada, because we don't have any. So, the fact that we got a little bit of water from the Compact, and that we didn't have an ag base probably set us up to be the city that needed water first. That had to go out and be pretty innovative and creative in trying to find ways to get water. So, I guess, maybe the circumstances and the climate, and the lack of agricultural lands, kind of set us up for what we are today.

ps That conference for the 1922 Compact, it's almost like Nevada didn't go to the meeting.

kb Well, the guy was drunk, they said. I don't know. (laughter)

ps So, Arizona farmers were there! (laughs)

kb I don't think they drink. (laughs)

ps Which issues of the Western water area do you think plays the biggest part in the growth of this area?

kb Well, I...you know, we talked a little bit about artificial re-charge. I did a lot of work, you know, trying to look at the possibility of doing that in the Las Vegas Valley. I've done, again, I told you, I filed the applications for the groundwater project. I don't know whether that's going to be a good thing or a bad thing in the, in the future. (laughs) I think it's going to be actually a good thing for Southern Nevada.

And then, I think I've worked on many of the issues that have transpired on the river in the past 10 years. I've worked on the Arizona Banking Agreement. Worked on the Multi-Species Habitat Conservation Plan. I think that's a pretty big thing.

And then, we're coming up with this huge milestone here, hopefully, in the next couple of days, of shortage criteria and, and reservoir operational guidelines, that I think will be huge for the future. So I've had the fortune to work on a lot of that.

ps It seems like you've always had to deal with shortages. That's always been an issue in dealing with water.

kb We've always been very close to, you know, hitting or, or projecting in the figures, that we're going to be utilizing all of our allocation. And then, with the drought coming in, that even put more strain on us. Which led to another very, I think, great milestone, and a very good success story for Southern Nevada, is our conservation program and our drought plan. We now, you know, have...we've shaved off about 50-thousand acre feet of demand on our Colorado River resources in the past few years. That's a tremendous thing that the community has done. And, we've been very fortunate to have a community that's stepped up and embraced the conservation programs, and our water spot (?) landscaping program that actually pays people to take out grass, I think, has been kind of a trendsetter through the West. So, you know, we've done a lot in conservation, also. Which is incredibly important to us in Southern Nevada.

ps Why don't you talk a little bit about the water conservation program. How did that get started?

kb Well, the drought, I think. In 2002, if you recall, it was...I think the run-off on the Colorado system was 25-percent of normal. A very low run-off year. And, that kind of got everybody's attention. And we went and we worked with our purveyor members to actually come up with a drought plan. And the drought plan was kind of a road map for each of the purveyors to go in and implement land use restrictions, such as no grass in the front yards for new homes after 2003. Only 50-percent of the back can be landscaped. So, we, we actually came up with these provisions that our purveyors put in place. That have resulted in this tremendous conservation that we've seen. Which has been a real success story, and I think we'll continue to see as we go forward. And the threat of the drought is still looming, and actually even more prevalent. We'll be looking at Shave the Peak campaigns. We'll be looking at future measures to make sure that we are using our water wisely in the desert.

ps What's Shave the Peak?

kb Well, as you can imagine, the Southwestern cities, especially Las Vegas, when it's so hot in the summer, utilize much more water in the summer than we do in the winter. So that's what we call it, a peak. We, we actually design a water system for one day. A maximum day. And so, we have a lot more water use in the summer than the winter. So, what we're trying to do is shave that peak. Or, take out a lot of outside uses. Make sure that we're trying to really reduce the water, or use it most efficiently, in the summer.

So, that's what we're calling maybe Shave the Peak. Is to try to reduce that water use, or that one maximum day use. And, that's a lot. Because the drought is threatening...you know, I'd mentioned that we have two intakes. The drought is actually threatening that we might lose water from our first intake. So, we might lose a significant amount of capacity. That's why we're looking at, how we reduce that summer peak, because that capacity is needed to meet that summer demand.

ps When you look at Las Vegas, it doesn't look particularly like it's conserving water. The fountains, the swimming pools.

kb Well, I think the fountains you see are usually...I mean, along the strip...and I think you, you can see that there's a pretty tremendous revenue (laughing) that's garnered from those fountains. I think, if you think of the hotel usage, and the amount of water that's consumed.

Las Vegas is a little interesting, too, because we get...every acre foot that we return to the Colorado River... I mentioned that we return it to Lake Mead, through treating our wastewater and putting it down the Las Vegas Wash. Every acre foot that we put in there, we get to take another acre foot back. So, we actually recycle all of the water that we put back in there. So, when you look at water use in the Valley, you should look at consumptive use. What water's actually lost.

And, the hotels, if you look at the water that they actually consume, it's three-percent of all the water we use. Now, you tell me any other city that has a better industry that only uses three-percent of the water that provides a tremendous economic boom for this Valley. So, three-percent is a lot...very little water for the hotels to use.

The actual person, or, not person, but, category that utilizes most of the water is the residential community. That's why the conservation program was targeting taking grass out, taking turf out, on residential and some commercial properties, too.

ps People still have their swimming pools though.

kb Well, swimming pools don't use any more than, than really grass. If you look at the evaporation out of a pool, it's probably even a little more efficient, or less than grass, cause people tend to over-water grass a little more. Or whatever. So, pools really are a little more efficient.

And, we've had a program in our landscaping...or, in our conservation program, to actually help people pay for pool covers. So, if you cover your pool, then, you know,

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you're minimizing any of the evaporation. So, I think, you know, it's something... It's hot here. You want a quality of life, that you want a swimming pool. It's something that's very doable, and it's really something you can minimize the use off a swimming pool.

ps You mentioned also, the Lower Colorado River Multi-Species...

kb Habitat Conservation plan.

ps Tell me about...what is that?

kb Well, that is a permit from the Fish and Wildlife Service to allow the operations of the Colorado River system for 50 years. What we did through negotiations with the Bureau of Reclamation, Fish and Wildlife Service, and all the, the members on the Colorado, we came up with a plan to protect endangered species and sensitive species. To actually secure more habitat. Create more habitat along the river for species. And, for this, it's, it's like a 602-million dollar program over 50 years, that will actually help the habitat and the environment on the Colorado River.

And, that was, I think, a very tremendous cooperation that we saw among the purveyors, the states, the Bureau of Reclamation. And what it results in is better habitat for the environment, and species. So, I think it's a real success story, and I think we're proud that we were involved in it. As were the other states. With the Bureau of Reclamation.

ps How were you personally involved with it?

kb Well, I had started attending some of the meetings for Nevada early on. And then, we had representatives at all the steering committee meetings. The meetings that formulated the documents, and all that. And those people were part of my staff that worked on that. And, I think we were very much....I think Nevada saw the need for it and was a proponent of the environmental needs of the river. That we needed to do this. And helped, I think, convince, perhaps, some of the other states that, that this was the thing to do.

So, um, it was a cooperative effort, but we certainly were one that was...early on, I think, very signed-up and very much a proponent that it should be done. So, we were kind of a cheerleader early on, I think.

ps So, the other milestone for the Southern Nevada Water Authority, the Colorado River Commission partnership. Can you explain that for us?

kb Well, we have a very great partnership with our state organization, that is the Colorado River portion of the state. You know, in Arizona they've got the Arizona Department of Water Resources and the Central Arizona Project. That's kind of like what we have.

We have the state agency, the Colorado River Commission, that we work hand in hand with securing water resources. They're signatory on the Arizona Banking Agreement.

We're on the eve, hopefully, of signing a number of documents that will help put into place the Bureau's guidelines for shortage criteria and reservoir operations. And, again, CRC and Nevada will be signing those documents. We've worked with them hand in hand. They provide much of the power to the Southern Nevada Water Authority, in terms of our treatment plants and pumping stations. So, it's a great partnership between the state and, and the actual regional water provider.

ps So, the Las Vegas Valley Groundwater Management Program?

kb We formed that a few years ago to actually help people that had issues with the groundwater, with their wells, and, and domestic wells, and quasi-municipal wells, that had temporary rights. If you have a quasi-municipal well, you probably have a temporary right. And, if you have a domestic well, you have a temporary right. And, if you have to deepen your well, then the city can actually require you to, to hook onto the purveyor system. If it's within a certain footage. 180 feet or something.

So, we established a program that we tax, per acre foot, all well users. And, it goes into an actual fund that does two things. That pays up to 85-percent for them to actually put in pipes and necessary facilities to tie into the purveyor system. And, also, buys artificial re-charge water that will stay in the aquifer, you know, forever. To help keep levels up.

So, it's a management program that I think is provides for connections to get off the groundwater system, as well as provides for water to stay in the system. To help levels stay higher. So, it's a great program. We've been very successful in the past few years in helping people get on the system, as well as buying water and leaving it in the aquifer.

ps What's the Las Vegas Wash?

kb The Las Vegas Wash is kind of another success story. What had happened, as the Valley continued to grow, we continued to generate more wastewater. And that wastewater was discharged to the Wash. And, what happened as the wastewater grew, you created the Wash that was an earthen channel that would allow it to become kind of hydrated, and once you have storm flows coming through, which we don't have a lot. But, when we have storm flows, we can have a lot of run-off quickly at, at the Wash. We'd actually scour the Wash, and so we started having erosion and head-cutting in the Las Vegas Wash. We actually lost 50, oh, I don't know, probably 80 feet in the lower parts of the wash. Actually cutting through and channelizing.

So, we saw the need that we...because of all the sediment going into, into Lake Mead, as well as, it was draining the wetlands that were in the Wash, we saw the need to go in and put in earthen dams and, and concrete dams to stabilize the Wash. And, the Authority led the effort back, it was in the late 1990s, early 2000, to come up with a Las Vegas Wash Comprehensive Adaptive Management Plan.

And, it outlined building new structures, re-vegetating the Wash. Doing a lot of environmental work, insuring that the Wash was going to be good habitat for species.

Looking at selenium. Making sure we didn't have selenium concentrations that would actually hurt wildlife.

So, this plan has been in place, and we're... I think, over half completed with putting the plan in place and stabilizing the Las Vegas Wash. And what has happened is lots of native vegetation has come back. Cottonwood and willow we planted. And, we've gotten salt cedar out, so that cottonwood and willow have actually grown. And have created a lot of habitat for species.

So, it's really, it's a very lovely place to go down. And there are hiking trails now, that are being put in by Clark County Parks. So, it's something that took an area that had been kind of devastated because of run-off and storm flows, and re-did that to an area that's now very nice for habitat, for recreation. And for people to enjoy a natural setting.

So, again, and that was the Authority with its purveyor members are the ones...and regional flood control in the county are the ones that are funding the re-vegetation of the Wash.

ps That's a very positive...Let's see, what other projects do I want to ask you about, the River-Mountain Water Treatment Facility.

kb I mentioned that, I think. One of the two treatment facilities that we have on the Colorado River water. The newest one is the River Mountain Treatment Facility. It's just on the Henderson side of River Mountain. So it is the second intake in Lake Mead, which is at a thousand, elevation, one thousand. Actually feeds the River Mountain Treatment Facility. It came on-line in 2002. It's, again, a very, very nice state-of-art treatment facility. We ozonate as a disinfection process. So it's state of the art there.

We also are very proud of an advanced water quality lab at River Mountain's Treatment Facility. We have a PhD that is renown in looking at pharmaceuticals and personal care products. Looking at the future of what we're seeing throughout, I think, the West and throughout the world, the endocrine disrupting compounds that we're seeing in water that's generated through hormones, personal care products. And so, we're actually at the forefront of that type of research. And very proud of that.

We're doing a lot of research and work throughout the utility industry, throughout...really the globe, in looking at that. So, we have, just about a year ago, we opened a new water treatment facility. Or, excuse me, laboratory. So, it's something that is growing, I think, in concern. If you read the paper, it's looking at these chemicals and what does that mean in the environment? And then what does that mean, actually, in the health of an individual? And now, those are two different things. And, I think that's what we're trying...our research to look at what it means to the environment, and other species, like fish species in the lake or in the river. And, what does it really mean if you ingest it as a human? Does it have any health effects? And, those are two very different things that we're doing quite a bit of research on that.

ps That's a huge issue. I didn't realize you were doing research here...

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kb A lot of it is being done here. Yeah.

ps And, that supplements the old treatment plant?

kb Yes. Alfred Merritt Smith. It is...again, combined capacity. We have 600 mgd, million gallons per day, capacity, the Alfred Merritt Smith. And we have 300-mgd treatment capacity at River Mountains.

ps That's the older one, that because of the water levels that has the issue of not being able to be used?

kb It's the intake. Yeah. The two intakes.... we do have pipe bypasses that the second intake, the deeper one, can feed a, a certain amount to Alfred Merritt Smith, also. But, what we're looking at is losing that capacity of the upper intake. Which can be augmented by the lower intake, but still we would lose, you know, about 40-percent of the capacity if we lose the, the upper intake.

ps That's serious.

kb It's very serious. It's one reason another project that we're working on is actually installing a third intake that would be in a different area, that would be at 865 feet, although the pump setting would still be at a thousand. But, it would be in an area that would be closer to the actual main channel of the Colorado River. And, would be in an area that we feel is probably the best area for water quality, of an intake. And, we're hoping to have that intake on line by 2013.

ps You've got some big projects going. (laughter) It says here that ozonation, you just mentioned that you're using ozonation?

kb On both plants. Alfred Merritt Smith and at River Mountain. So, all the water that we treat and put into the distribution system is ozonated.

ps The Silver Hawk Power Plant. You're also producing power as well as water?

kb We had purchased 25-percent, or paid for 25-percent, of the Silver Hawk Power Plant. Because, you can imagine, if you're pumping water from Lake Mead, and Lake Mead is at an elevation of about eleven-eleven (1111) now, feet above sea level, and we're pumping it up to the Summerlin area, which is probably over 4000 feet, you're pumping water a long way, and it takes a lot of power. So, we did purchase or pay for 25-percent of the Silver Hawk Plant. Right now we have an operating agreement that Nevada Power actually operates that plant. And we get the power, the power from them. But, that is a very significant part of our power supply for the large pumping that we have to do from Lake Mead.

ps A few other things that I wanted to talk to you about, the Arizona Water Banking? Tell me how that came about, and how that works.

kb Well, it.... Arizona has been doing that, for a number of years, large-scale Colorado River Water Banking. They actually do it two ways. They can directly inject Colorado River water into the groundwater system. Or through spreading...spreading basin, as we talked. That's how they mainly do it. Through spreading basins.

Or, they can also do it in lieu. That is having farmers actually utilize Colorado River water instead of groundwater. And then, that allows that groundwater to actually accumulate or be in lieu stored. So that's the two ways that they accomplish probably between 300 and 400-thousand acre feet per year of storing water, in Arizona.

So, what we did back a few years ago, was approach them on, how about if they stored some water for us, and we paid them for it? Arizona was storing water to buffer against shortage. They are the ones that will bear the largest shortage on the Colorado River, and so, they're storing that water for their future use. So, we're saying, why not, if you could, if we could pay you like the municipal rate, could you store it for us? And, they became a very good partner for us, and worked with us, and have been storing water for us.

We've amended our agreement. At first, the agreement was such that it was...they were going to use their best efforts to store up to like 1.25 million acre feet for us. In the future. And we amended the agreement, about two years ago, that they actually now are storing it, and guaranteeing that they will store 1.25 million acre feet.

So, that's a great bridge for us. If you look at our water resource plan, we've got a great bridge that we can utilize that water as we develop future supplies, augmentation supplies. Additional water supplies. That, that will get us through, between the time that we will be actually using our, our total allocation of 300-thousand acre feet of Colorado River, till the time that we can bring on additional supplies.

ps And, the one million is the total over...?

kb One-point-two-five. Yeah. It's the total block of water that we can utilize. We can take up to....consumptively....and, again, that return flow of credit thing gets in there. We can take up to 40-thousand acre feet per year, which, if you're diverting it from Lake Mead, that's about 68-thousand acre feet per year. And that's what we can use. And, we get to be able to utilize that water until it's gone, of course, or till 2060. That's when the agreement would expire, if we don't utilize all the water.

ps So you don't actually go over to Arizona and pump that water out?

kb No, no, no. What they do is, that water that has been stored for us...then they can actually turn their groundwater wells on and take that water. And then, they don't take as much Colorado River water. So, we then take that Colorado River water from Lake Mead. So, it works very well. You don't have to have any facilities, other than the facilities in Arizona to bank it in or to recover it.

ps You don't need any pipes.

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kb We don't need any pipes from Nevada to Arizona, or Arizona to Nevada. Right.

ps How important is that Arizona banked water in your overall plan to survive?

kb It's critical. It's again, it's a bridge water that is going to take us time, we think...we know it's going to take time...from the, the time that we start to use all of our allocation, our 300-thousand, to the time that we can.... We're looking at augmenting like...perhaps participating in a desalter in Mexico. Or a desalter in California. Something like that, to provide us additional water. Also, our groundwater project that I talked about. It's going take time before we can bring that down. By 2015 or 2016 is when we think we'll be bringing water down from the groundwater basin. So, we have that need for that bridge water before we start having additional water come in the Valley. And, that Arizona water is very important to us to, to bridge to those future supplies.

ps Do you think this whole agreement is a precedent setting agreement?

kb The Arizona agreement? Yes. I think 10, 12 years ago I don't think you would have had the possibility that you could actually...you know...that you had a, a mechanism that a state could bank water for another state. Which, the Bureau of Reclamation came out with regulations that implemented this banking program. And, I think that just shows you a little flexibility that we've seen on, on the, on the river. That's a huge thing for Nevada ...and actually California. We've banked a little water in California also, for future use. So, that gives us a lot of flexibility for the future.

And, I think as we face this....looking at what the bureau is doing with their shortage guidelines and operational criteria, there's, they've, created something called Intentionally Created Surplus Programs. You see more and more, this is just a sign of the flexibility that is starting to be achieved on the river. That people are seeing how to solve some problems, without totally throwing everything out and trying to re-write it. They saw that within the law of the river. And, I think the Arizona Banking Program is one of the first examples of that. As will be the hopefully, the reservoir operating criteria and shortage criteria that will be coming out here in the next few days from the Bureau of Reclamation.

ps Why don't you talk...because you've mentioned it several times...this shortage criteria agreement. Is that the Seven States Agreement?

kb Well, the Seven States Agreement is one part of that. The Bureau, a couple of years ago, started the, the process saying, with the drought being as prevalent as it is, that we need to look out, and figure out how we're going to impose shortage on the river if the drought continues. So, what they've looked at doing is specify how much ...at what lake levels, how much shortage will be called, and who would bear that shortage? As well as kind of re-establishing how lakes Powell and Mead operate.

We've had an operating plan that says, if it's equalization, then you equalize from Powell to Mead. Or, you release 8.23 million acre feet. But, what we're looking at now, is

having the level of Mead kind of dictate maybe how much is released from Powell. It's a different way to try to operate the reservoirs, trying to maximize the capacity in both, and utilize them as two units together. Not as, as two separate units.

So, those things, with the shortage criteria and the operational criteria, as well as the Seven States Agreement are going to be a huge, I think, infusion of flexibility on the river system. So, it's something that we are anticipating the Bureau to finalize in the next few days. And, will be something that will be implemented, I think, in 2008. Which gives Nevada some flexibility in utilizing some of the water that...the old tributary water. We have water that we've purchased on the Virgin and the Muddy rivers. We'll be able to utilize that, bringing it through Lake Mead. As well as utilizing groundwater that's been imported ...Coyote Spring, we're looking at pumping some water that would not get to the Muddy, unless we pumped it and put it there. And then it will get into Lake Mead, and we'll get credit for that. So, it's a start again on flexibility and being able to bring additional water into Southern Nevada.

ps So, what is actually the Seven States Agreement?

kb It's an agreement that, of how the Seven States go forward, and that we will try to work together through all these...hard times, (laughs) if you will. And, that we'll consult with each other and not litigate.

It also provides...there was an issue that Southern Nevada was going to develop Virgin River rights that we got in 1994. So, newer rights on the Virgin, that the Upper Basin States don't think we have the right to take. So, there was an issue there. And so, what we decided to do in the Seven State Agreement was put that aside, and say that we'd, we'd face that later, if we could put this package together, that we've been talking about ... the shortage criteria ... Reservoir Re-Operational criteria. And, that also provided Nevada to get some more bridge supplies by actually funding a reservoir in Southern California, called the Drop Two Reservoir. That allows us to get some bridge supply of water, kind of, much like the Arizona Bank. It's a one-time source of water, that we can utilize up to about 40-thousand acre feet a year. Just kind of like Arizona. That allows us, in time, to develop, as I mentioned before, maybe a desalter operation in Mexico or something like that, to bring additional water in to Southern Nevada.

So, all of that is kind of embodied in the Bureau's guidelines, the Seven States Agreement. We have a number of agreements that would have to be executed to put the guidelines into place. That's a forbearance agreement. Delivery agreement. All these agreements are kind of coalescing, and hopefully will be signed here in the next couple of days.

ps It's very complex.

kb It's, confusing as heck. Yes.

ps You mentioned you would not litigate. That's an interesting...

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kb We would consult before we would litigate is what...

ps You could still litigate?

kb Oh, yes. I don't think anybody gave up their right to, to litigate. But, I think it's a recognition that, it's much easier to work together. And, I think, the fact that...you have a banking program in Arizona, and that you're on the eve of the execution of all these agreements. Show that working together within the confines of the law of the river is very doable and workable. I think that it, it says it's better not to litigate. It's better to work together, all the documents together.

ps You mentioned, a couple of times, that you have a water banking agreement with California?

kb Yes. We have, I think, banked about 20,000-acre-feet in California. Again, it's a much smaller amount that we bank so far. But, it is an agreement that if we have additional water we can bank it in California for future use, also. Much like Arizona. Again, it's a smaller agreement, and, limited to a shorter period of time.

ps So, are you actually banking water there?.

kb We have...we haven't in the past couple years. We did about three years ago.

ps It doesn't seem like you have that much water available.

kb Well, we're having more since our conservation program has been so successful, we've had more that we aren't using. So, we can bank it in, as I said, in this Valley, through our injection, artificial re-charge program. Or, we've also banked some in California.

ps How have you seen the whole Western water issues change during your career?

kb Well, I think we've talked about the flexibility that we've seen now, the, the more openness, I think, the states are to work together to solve some problems and create some opportunities on the river. I think that's been a tremendous difference in this has fostered flexibility and cooperation in the past 10 years.

And then, I think what we see with the drought and potential climate change, if it's climate change is a real wake-up. If you look at the, the hydrology of the Colorado River in my 20 years of working on the Colorado River, it's been very favorable. Very high, very good run-off. Lots of water in the system. I think the past few years have shown us another side of that. That there could be a lot less water in the system for a 20-year period, or even, maybe, forever, if global warming is actually occurring. So, I think, I think we're seeing a wake-up call that we could have very different conditions on the Colorado. I think the cooperation that we've seen in the past 10 years is going to need to be there in spades, if you will, because of what we might be facing as far as climate

change, and the possibility of having less water to work with, and a lot more people still coming into the Southwest.

ps Do you think climate change is a real issue that is affecting the Colorado?

kb Yes, I do. I do. I think if, you can argue all day long on what might be causing it, but if you've looked at the past, you know, few years, we've had the hottest summers, the warmest winters. I mean...you know...the polar bears are drowning. (laughs) Because they have to go so far out to, to get food, that they're drowning coming back. So, I mean, there is certainly something that is, is going on that is very different climate than we've seen in the past. So, I think there...it is changing. What that means for us, is something that we're grappling with. Trying to do research, trying to prepare, trying to plan. It's hard to know what that means, but, I think it's something that I think we've got to start looking at. That it's here and changing perhaps faster than we ever thought it might.

ps What problems or issues relating to Nevada's water do you think are the most critical today?

kb Well, I think the climate issue on the Colorado is a huge one. I think critical to Nevada today...extremely critical to Nevada is to build the in-state groundwater project. I think as we face drought, as we see shortages looming, that we need to have an additional source of water in Southern Nevada, and that's got to be our in-state unused groundwater. So, I think that is probably the first and foremost thing on our plate as far as a responsible water manager in Southern Nevada, is to accomplish and complete the groundwater project as a drought buffer and as a supply for Southern Nevada.

ps What about bringing water from Northern Nevada?

kb That's, that's what I was talking about. The in-state groundwater project.

ps Okay.

kb Yeah. And it's from Eastern and Central Nevada. Our filings are...go up North, uh, to a valley that's just east of Ely, Nevada. So...some go all the way up to Northern Nevada. But, it's going about 200 to 300 miles north of Las Vegas.

ps So that's where you're getting the groundwater, to be used for Las Vegas?

kb Yes.

ps Have there been any surprises for you regarding water in Nevada?

kb Surprises regarding water? I think one of the most pleasant surprises regarding water was the actual response to the community with our drought plan and our conservation plan. I don't know, surprise maybe isn't the right term. But, it was very amazing how the community actually did respond and the success we've had in saving water. And I think the commitment to continue to do so as we go forward.

ps And, talk some about dealing with the shortages of Colorado River. Are you seeing Nevada play a major role in that?

kb Well, if everything is finalized, as we've talked about, in the next few days, we will have specified how much shortage Nevada takes, up to a certain point, in Lake Mead. If Lake Mead gets to elevation 1025 then you have to re-consult with the Secretary, and so, shortages aren't defined at anything lower than that. But, until then, the first shortage would be imposed, if everything is adopted as proposed by the states, which I don't know that it will be exactly. But, the States have proposed at 1075, then certain shortages kick in. At 1050, other shortages.

So, we know...and that's the best thing about what the Bureau is trying to do, is give the states and the purveyors certainty in what shortages they're going to have to a certain point. So, Nevada will know what shortages it has to meet, and will make plans to meet those shortages. So, it's not a surprise, if indeed the Seven States proposal is kind of put into effect by the Bureau of Reclamation.

ps So when you talk about levels 1075 and 1050, what are those levels?

kb Lake Mead levels.

ps ... the height of the water?

kb Elevation. Yeah. Just elevation above sea level. So, we're sitting now probably at an elevation...two thousand...something like that... above sea level. Lake Mead's elevation right now is 1112. So, it's just above 1100 feet. And, we're talking about shortages if the lake gets to 1075. So, if it goes down thirty-some-odd feet.

ps And, it's been much higher.

kb Yes. It was... back in the 1983 and 84 floods, it was spilling. So, it was actually going over the spillways. So, it was over 1223-feet. Something like that. So, it's been much higher.

ps So, thirty feet is not very much to deal with

kb No, it's not.

ps You can see the ring around the lake on the rocks to see how high it's been.

kb Yes, you can. Yes, you can.

ps You mentioned a couple times about desalination as an alternative. Would that be the Yuma desalination plant?

kb That's a possibility. I think we've been looking and talking about potentially running that plant at a reduced rate. Not at full capacity. And perhaps paying for that plant to run

and getting some water from that. That's a possibility. We've also looked at an augmentation study that looked at potentially desalters on the coast of Mexico or on the coast of California. And then, trading water, kind of like we trade in Arizona, for taking more water out of Lake Mead. But, that, of course, will be a condition upon us having water in Lake Mead to take. (laughs) I mean, you know. So, desalting is certainly, I think, part of the future. I just don't think...I mean, it's not...the complete solution for everything in the future. That's why the groundwater project is extremely important for us to have another resource besides that resource we take from the Colorado River.

ps California could use desalting pretty well, especially San Diego and Los Angeles right on the ocean... (kb – Sure.) but for Nevada and Arizona desalting has limitations.

kb Other than trading it out. I guess that's the best way to do it. I'm not saying that, you know, I guess you could run a pipeline, but it's pretty crazy if you do that. But...

ps If they're pretty desperate. (laughs) That whole Yuma desalination plant has had its ups and downs. It's been sitting there for years.

kb It's been sitting there for a long time. Yeah. It's run...at certain reduced capacities. They just had a program that they ran it a few months ago at...about a 10-percent, eight-percent capacity. So.

ps Wasn't that just a test to see if everything was still working? But it really has never really run...

kb At full bore? No.

ps So it has been just an experiment that has never really provided any substantial water.

kb That's right.

ps And, I guess there's other issues that come up with desalination, the salty brine that is produced is a problem?

kb Oh, the, the reject stream. Yeah. Absolutely. How you dispose of that is, is a large issue. The Coastal Commissioner of California has been looking at that. And, you know, that's an issue that's been very front and center in California.

ps You've already answered some of these questions that I have here. How do you anticipate Nevada's future water challenges, or future challenges in general for Nevada?

kb Well, I think we're seeing a very interesting time in Southern Nevada. I think we're starting to grow differently. A lot of people are going to high-rise living more than the single family homes. Single family homes are getting smaller because land is more expensive. And smaller yards. So, I think we see a transition. I think we see, though, that probably...certainly Nevada is going to continue to grow. So we have to continue to be very efficient in our future water use.

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I think we have to bring in the groundwater project for drought protection. And, I think through the flexibility that we have now with the states, that we can continue to work on securing additional resources. But it's going to be very interesting to see how the Southwest continues to grow. It's grown so much in the past, that I think we're going to see it continue to grow in the future. So, I think it's just not Nevada that's going to be challenged, but many of the, the bigger cities in the Southwest as far as water supplies and insuring that we have enough, and are efficient in using those supplies.

ps Some people have said that, we need to set some limitations or controls on growth. Do you see that as viable alternative?

kb Well, what do you control? I mean, I don't know how you do that. Are you going to control growth in the West? Are you going to...how do you do that? I mean, I think it... We're seeing now a very large decline in building permits. Because of just the national economy. So, I think it's very hard to try to force something one way or the other. But, I think you'll see, as we are now, that it is slowing down some. But, I don't know what that means in the future. But, I don't know how you control growth by trying to stabilize something. You're trying to limit something. I'm not sure how you do that.

ps Certainly I don't think anyone predicted the growth that we've seen in the Southwest.

kb No, I don't think anybody predicted it. At the rate, at the rate it's happened. No.

ps Hard to predict for the future, too. I've got a few more questions. Maybe we should start a new tape.

END of TAPE #1

Colorado River Water Users Association –NEVADA

TAPE #2

KAY BROTHERS (Tape #2)

ORAL HISTORY INTERVIEW

December 12, 2007

kb – Kay Brothers

ps - interviewer Pam Stevenson, Agave Productions, Inc

bs - videographer Bill Stevenson

ps We've done many oral history interviews for the Central Arizona Project, but as we're doing these interviews for the Colorado River Water Users Assoc. it's been very interesting to get the perspectives of other states.

kb You mean they have different perspectives? (laughter)

ps Some of the long-time people I've been talking to, they've have been doing this for 50 years, one of the questions I ask them is, "what advice do you have for people dealing

with the Colorado River water today?" But, you're still dealing with it. So. (laughter) It has been interesting in doing the oral histories, to get the perspective of people in their 80s and 90s....

kb What do they say?

ps Most of them say that they're doing fine and, you know, just keep doing what they're doing. We haven't gotten any real critical comments.

kb My advice would be to be scared to death! (laughter) Because of the potential of reduced flows, climate change. That you better be cooperative, and get with each other, because you're going to need each other if you're going to meet the future.

ps We need to work together (kb – Hm, hmm.) to meet these huge challenges. One of the things, in talking to different people, is that things have changed over the years. The Indian water rights became an issue. And, in Colorado, the recreational users became an issue. And, of course, the environmental issues have always come up. Do you see anything new coming up that we haven't thought of?

kb Well, I think the environmental issues will continue to play a bigger role, and we'll have to handle them, actually, probably, water will be created for some of their needs, I think. I think it's going to be interesting, too, to see if indeed the less run-off is part of the future, how we do address that? Is it going to go to agricultural areas? Are we going to see more of a limit on, you know, what crops you do grow because of the value? Or, if crops can be grown someplace else that, you know, has more water. I mean...

I think you're going to see an adjustment of the market in agriculture, too. But, you know, there's going to be a lot of competing needs for it. So, I think the more efficient you are, whether you're agriculture or you're urban or whatever, the better off you are. And I think that's why conservation is incredibly important to all communities, as well as to the agricultural entities, also.

ps I know in Arizona and Colorado the balance between agriculture and urban is constantly being challenged. Is that true in Nevada, also?

kb No, as I told you, kind of to begin with, that's one thing about Nevada... that, we on the Colorado River. It's only used in Southern Nevada. And, we just don't have any lands that are that good to irrigate. So, we don't have that agricultural buffer. So, when we look at trying to meet a shortage, it's not something that we can go pay some farmer to fallow a land in our state. We don't have any land that's being irrigated by Colorado River water. So, we don't have that buffer. So, we're in a little harder area to, to go find additional water. That's why conservation is very important to us, but then we are drought-hardening our urban supply, also. So it is a balancing act.

ps Agriculture is more important in northern Nevada.

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kb That's correct. And, again, that's why we go back all the time to our in-state groundwater project being very important to us. For the drought buffer, for flexibility, and for diversity of our resource.

ps Some people have said that, that big water projects...the era of the big water projects...has ended. Do you think that's true? Or do you think there could still be big water projects?

kb Well, I think, again, the climate change issue and all that might change our mind on big water projects. That, it might be that, it might be good to have storage when you have it. People in environmental communities can argue that that storage is probably useless because you get more evaporation off of it, and lose more.

So, I think, you know, in the short term, probably the big water projects are certainly off the table. But, I think, we don't know what we're facing in the future as far as climate change and different flows, so.... You know, it could be in the future that we're going to be looking at doing something like that if....to save or to try to store something when we do have larger flows, since the norm might be smaller flows and reduced flows.

ps Do you think there will ever come a day when they'll say, well, maybe we should just not live in hot places that don't have water?

kb (laughs) Well, you know, I think if you really think about the future, you better just realize that anything can happen. So I'm not so sure that that might not happen some day. I don't know. If there's no water coming down the Colorado...or whatever...it's hard to believe that would ever happen. But, it's hard to believe that we're seeing the climate change as quickly as it is, too.

ps It's hard to believe that so many people live in the desert as we have in Arizona and Nevada.

kb A lot of people, a lot of people do.

ps We won't have thought that 100 years ago...(laughs) that we'd have such big cities here. The Appropriation Doctrine of right in time, first in right. Do you think that's going to survive with the new demands of drought and population growth?

kb I think it will survive. I think it will get flexibility. We've been talking all morning about flexibility. That you're still going to have your right, but you might be marketing it, or you might be allowing a city to buy it in times of drought. So, it might be, draw your options that are, that make you win-win, too, if you're a farmer. So, I think there could be flexibility that preserves your right, but gives flexibility in times that water needs to be re-distributed. So, I don't think you're going to see, overnight, some change in law that you're going to ever be able to lose your right. I think there'll be flexible ways that you can actually let other people use it for a certain amount of time, but not lose it.

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ps The Indian water rights...seems like they've gained the water, but they're going to sell it back, to the people, to the high bidder. You don't have those issues as much here. One of the other issues that's come up is should, Nevada advocate to re-open the 1922 Water Compact, to renegotiate that?

kb As long as we're able to achieve the flexibility that we've seen in the past 10 years, I think no. If we ever got to a point that we couldn't get the cooperation and the flexibility, you know, it's hard to say that you would actually do that, because you never know. Changing something, you never know what's going to come out of it. So, as long as we can continue to work together, and solve problems, and have flexibility and cooperation, I don't think there would be any benefit in re-opening it.

ps Colorado people certainly don't (kb laughing) want to re-open it, but I thought maybe Nevada people might.

kb Well, I think... It's a guarded, it's a guarded....if everything continues to go well, you know, and that we can work together. I think it's....anytime you re-open something like that, it's going to be.... Can you imagine how long it would take to go through litigation? I think the more you can get solutions in place, even though they might be interim, the better off you are. Cause you don't know. I mean, just like they didn't know what...in 1922, nobody thought that we'd be sitting here in 2007, with two-million people living in Las Vegas, Nevada. So, what do you think is going to happen in 2057? Or 2077? Who knows? You know, I mean, there's no way that you could have something that you can foresee exactly what happens, and exactly what's going to work. So, the more flexibility, and the more you have to try to make things work, or respond to the situation, the better off you're going to be. You'll never have something that's going to exactly be what's going to be needed for 100 years.

ps One of the things they wanted me to be sure and ask you about, is your involvement with the Colorado River Water Users Association. What role did you play?

kb I've been going to their meetings for a long time! No. We've had people from the Las Vegas Valley Water District, and the Authority, and our purveyor members that have been, you know, president. Kurt Segler, just a few years ago, was president of the Colorado River Water Users Association. So, our purveyor members have been very active. And all of our, our people that work on the Colorado have been very active in Colorado River Users. Our, our staff is on the Programs Committee, on the Resolutions Committee. So, we've always had people that have been very active in the Colorado River Water Users Association.

ps What about you personally?

kb Attended the meetings for...15 years now! (laughs)

ps How have those meetings changed over the years?

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kb Not a lot! (laughs) No, I think it's always a good time for people to, to get together. I think it's always...in the Bruce Babbitt days he'd come out and shake his stick and threaten to regulate us if we didn't regulate ourselves, and all that. So, it was always a banner kind of meetings that you've got, you know, the Bureau, and, you got the update on what was coming down from the federal Bureau people. So, it's always been a, kind of a time, I think, that you talk about the changes that are coming on the Colorado. And, I think, the panels, you talk about the environment. You talk about the past commissioners. So, it's always been something that kind of sets the stage for what's going to happen in the future on the Colorado.

ps Did whoever was the Secretary of the Interior make a big difference to you?

kb Oh, I mean, they're different personalities, yeah. I think it makes...you know... Babbitt... Bruce Babbitt was always very...you know ...he's a very colorful person, and out there. And, he was very much, you know, an event when he would talk to the Colorado River Users. And, we're very much looking forward to this Secretary, hopefully signing a record of decision. And, hopefully putting in place ... setting the table for the signing of all the documents to put all this in place. And, this could be a very, very large meeting, and a very important one in the history of the Colorado that's coming up in the next two days here.

ps The Secretary of Interior, who is the Secretary of Interior, plays an important role in the Colorado River.

kb Oh, yes. Absolutely. The Secretary of Interior, the Bureau of Reclamation is the Water Master in the Lower Basin. So, it's a very, very large role indeed.

ps Have you gotten to know most of those Secretaries of the Interior?

kb Oh, I've met them. Yes. I've met Mr. Ken Thorn. So. You know.

ps Does it help when they're from this region?

kb Oh, from the West, yes. That's tremendous help when they understand the, the situation in the Western states. I think that's a very important thing.

ps Babbitt was credited with re-writing the groundwater law in Arizona, so obviously water was something he always knew about. What accomplishments regarding water are you proudest of?

kb Well, that's a very interesting question. I think probably, I guess, the, the Arizona Banking agreement is one of my things that I worked most on. That I think that has been very...will be very beneficial to Southern Nevada. And, I think the Multi-Species Habitat Conservation Plan. I think the commitment to the environment that we put in place for 50 years on the Colorado is something that I think, that all the, the entities should be proud of. So, those probably, I guess, off the top of my head, would be the two.

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ps Of course, you're still in the midst of your career. You're not done yet.

kb (laughs) Oh, we're coming to the, to the end of it, I think. (laughs)

ps Is there anything that I didn't ask you that I should have asked you?

kb Oh, you asked me too much already. (laughs) No.

ps Anything, Diana, that you wanted me to ask?

ds No, I think you covered it.

ps Well, one thing I always like to ask, just to wrap up, is, in talking with young people, do you advice that you give when they are trying to decide what career they want to pursue?

kb Well, I think, you know, if you get in a career with water, or some water resources, there's one thing that we cannot do without in your life. Anybody or any being can't do without. And, that's water. I think having clean water, and enough water for personal needs, are probably some of the best public service you can give to anybody. So, I think, public service is something that I would encourage anybody to do, because it's most rewarding. And that, if you're in public service for water, you can't go wrong.

ps Very good. Okay/