

WATER FOR LOS ANGELES

Samuel B. Nelson

Interviewed by Andrew D. Basiago

Completed under the auspices
of the
Oral History Program
University of California
Los Angeles

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BIOGRAPHICAL SUMMARY

PERSONAL HISTORY:

Born: May 15, 1902.

Education: graduated from Pomona College in 1924;
engineering degree from Cornell University.

CAREER WITH LOS ANGELES CITY DEPARTMENT OF WATER AND POWER:

In 1926, Mr. Nelson began working at the DWP. The positions he held were the following:

Draftsman assigned to the Colorado River Aqueduct project;

Head of the field engineering division;

Head of the plant protection division;

Head of the water construction division;

Engineer in charge of the aqueduct division;

Assistant chief engineer of Public Works, 1950-55;

Assistant manager, 1955-60;

General manager and chief engineer, 1961-67.

Vice-president, Daniel, Mann, Johnson, Mendenhall, consulting engineers and architects, 1967.

Director, California Department of Public Works, 1967-68.

General Manager, Southern California Rapid Transit District, 1968-70.

PROFESSIONAL AFFILIATIONS:

American Public Power Association, electric research council.

American Society of Civil Engineers, secretary, vice president, and president of the Los Angeles section.

American Water Works Association, executive board of the California section, senior member thesis award committee.

California Municipal Utilities Association of United States and Canada.

California State Interorganizational Committee on Water Conservation.

Colorado River Association.

Colorado River Board of California.

Council of Founders Societies Major Disaster Committee, chairman.

Feather River Project Association, chairman of the engineering committee.

Federal Power Commission West Regional Advisory Committee.

Governor's Utilities Advisory Committee, State of California.

International Conference on Large Electric Systems, United States national committee.

League of California Cities.

Los Angeles Civil Defense and Disaster Board.

Los Angeles County Watershed Commission, study committee.

Mayor's Committee on Effluent Water Reclamation, City of Los Angeles.

National Water and Sewerage Authority, consultant, 1962-63.

Six Agency Committee of the Colorado River.

Southern California Water Conference.

United States Department of the Interior, industry advisory committee for the defense electric power administration.

University of Southern California School of Engineering,
board of councilors, lecturer.

Water and Power Speakers Club.

Western Energy Supply and Transmission (WEST)
Associates, board of directors and vice president.

World Bank, consultant, 1962-63.

OTHER AFFILIATIONS:

Al Malaikah Shrine.

Association of the United States Army, director of the
Greater Los Angeles chapter.

Hollywood Masonic Lodge.

Los Angeles Athletic Club.

Los Angeles Chamber of Commerce.

Los Angeles Consistory.

Los Angeles Electric Club.

Los Angeles Rotary Club.

Tau Beta Pi, honorary engineering fraternity.

Town Hall.

Wilshire Country Club.

AWARDS:

American Public Works Association and Kiwanis
International: one of the Top Ten Public Works Men of
the Year 1965.

American Water Works Association, California section:
Elliott Award, 1965.

INTERVIEW HISTORY

INTERVIEWER:

Andrew D. Basiago, Interviewer, UCLA Oral History Program. B.A., History, UCLA.

TIME AND SETTING OF INTERVIEW:

Place: A conference room at the headquarters building of the Metropolitan Water District of Southern California, 1111 Sunset Boulevard, Los Angeles.

Date: February 7, 1986.

Time of day, length of sessions, and total number of hours recorded: There were two interview sessions. The first began at nine in the morning and lasted three hours. The second began at one in the afternoon and lasted four hours. A total of seven hours of conversation was recorded.

Persons present during interview: Nelson and Basiago.

CONDUCT OF INTERVIEW:

This oral history is one in a series with retired long-time employees of the Department of Water and Power, City of Los Angeles, and individuals in the Office of the City Attorney for Water and Power. Duane L. Georgeson, Assistant General Manager-Water, Department of Water and Power, selected individuals to be interviewed after consulting with key members of his staff.

In preparing for the interview, Basiago consulted sources in the DWP's municipal reference department and in the Water Resources Center Archives at UCLA. He looked at inhouse material, including DWP memoranda and the employee magazine *Intake*. In addition, he also read several academic histories and reviewed the *Los Angeles Times* dating from 1913 to the present.

The interview covers Nelson's forty-year career with DWP. Topics covered include Nelson's work on the Colorado River Aqueduct, Nelson's leadership of DWP during the 1960s, DWP's role in the Owens Valley, development of Metropolitan Water District of Southern California (MWD), and DWP's activities during World War II.

EDITING:

George A. Hodak, editorial assistant, edited the interview. He checked the verbatim transcript of the interview against the original tape recordings, edited for punctuation, paragraphing, and spelling, and verified proper names. Words and phrases inserted by the editor have been bracketed.

In January 1987 the edited transcript was sent to Nelson, who began to review it, but became incapacitated and was unable to finish. Mrs. Nelson returned the manuscript in September of 1987. Robert V. Phillips assisted in the verification of unanswered queries.

Bryce Little, editor, prepared the table of contents and biographical summary. Gary White, editor, prepared the index.

SUPPORTING DOCUMENTS:

The original tape recordings of the interview are in the university archives and are available under the regulations governing the use of permanent noncurrent records of the university. Records relating to the interview are located in the office of the UCLA Oral History Program.

TAPE NUMBER: I, SIDE ONE

FEBRUARY 7, 1986

BASIAGO: I think what I'd ask you first would be whether there were any events or interests in your childhood in water that later led to your interest to join the department [Los Angeles City Department of Water and Power (DWP)] in 1926?

NELSON: Not in my childhood. Prior to my college work I went to Hollywood High School. I was born in Kansas City, Missouri. My folks followed my maternal grandfather out to California in 1916, and I graduated from Hollywood High School in '20 and selected--principally because of the campus and the, what I thought were, superior professors-- Pomona College. I had planned to take only two years at Pomona, and then get my advanced work elsewhere. During summers I worked on a survey party for Southern California Edison Company, and the chief of the party that I worked with was a Cornell [University] graduate. He convinced me that Cornell was the place to get my advanced education and I-- But as time goes on, you make friends and you join organizations at a college like Pomona. (That was before it became the Claremont Colleges.) So I continued and graduated after three and a half years at Pomona in the fall of 1924 and I had at that time two scholarships offered to me. They were limited; it was financial help.

At that time, fifty dollars a month took care of housing and that's about all. You could work your way through for the other things.

Our family was not exceptionally affluent. We had a brother and two sisters; both of my two sisters and brother and their later children went to USC [University of Southern California]. I went back East and decided that Cornell had the better opportunities, and in fact I enrolled as an architect in the architectural college. I had taken a liking to that field, but finances-- It turned out it had to be a three-year program, even after my four years at Pomona. So I switched over after one year to civil engineering and completed that in '26. Then a friend of mine, a close friend at Pomona, came back to Ithaca and Cornell, and we bought ourselves a touring Model T secondhand. I think we paid something like three hundred dollars for it. We got some help from his folks and we toured the country on the way back. All the way from June clear on in through the later part of July coming back to Los Angeles, stopping at his relatives and my relatives across the country and getting food and housing. Strangely enough, at that time we found the best places to park our car and sleep in our bedroll or blankets were cemeteries. The cemeteries were open and they had water and it was a pleasant place--no one would bother you. So we made a

habit of stopping at cemeteries crossing the country, which was unusual. But it was a safe way to hole in for the evening.

We came back and, of course, I immediately started to see what I was going to do. My sister's husband, Mel Phegley, was an electrical engineer, graduated from USC. He was working for the power system, the Department of Water and Power, and he suggested that I come down and see if there were any openings for civil engineer, which I did. They were at that time-- The City of Los Angeles Department of Water and Power then had a Colorado River Aqueduct division, and they were surveying the land between Los Angeles and the Colorado River. The department, the city of Los Angeles, had filed on water for the Colorado River--1,600 second-feet. They were surveying the land with the objective of preparing maps and tracing out various routes whereby they would bring water from the Colorado River. So I went in and took a little oral examination from one of the supervisors, a fellow by the name of-- It slips me at the moment. And they hired me and asked me when I was available. I said, "Right now." So I went home (we lived in Hollywood) and packed a suitcase and came down the next morning early. They gave me a ticket on the Southern Pacific railroad and I went down and rode to Beaumont.

Beaumont was the main office for the surveyors, and they had taken over an old hotel building which is still there. The ground floor was full of drafting tables, and the engineers stayed upstairs in various rooms on cots. Then they had a mess hall about a block away, and the topographers and the engineers that were doing the office work ate and slept there. I was there for about two months, I guess. This is now in August of '26, and they sent me to Parker, Arizona, by train. Two of us, Wayne Wyckoff and I, were in charge of the office, and our job was to take the notes from the surveyors. The triangulators had been out and triangulated the area, and we'd plot those on plain table sheets. Then the topographers would take the sheets and go out and fill in the contours. That was a very interesting job because I got out with the [surveying] parties occasionally. That was in '26 and in March of '27. [actually 1928]

I'm sure you recall Saint Francis [or San Francisquito] Dam, which was one of the structures at the lower end of the Owens River Aqueduct [First Los Angeles Aqueduct], a concrete structure. It failed about midnight. It was a very disastrous thing because the reservoir was almost full and the water, of course, came down the Santa Clara River. While the telephone operator tried to notify everybody downstream, they weren't very

successful. Most of the inhabitants along the Santa Clara River were low-income Mexican families and didn't understand English too well. And then to have them evacuate in the middle of the night--this happened at midnight--was just almost impossible. So there were a number of lives that were lost that wouldn't have been lost if it could have been properly evacuated. Well, I was sent up there with the other engineers to survey the flood-control damage which the department, of course, would be responsible for replacing. That's when I met Captain [Henry] Jacques, who was an engineer, graduate of Colorado School of Mines. He had been in the First World War, and he was a captain of engineers. We set up offices in Santa Paula and operated out of there. The field crews did all the surveying and the location of the revetment works that were destroyed as a result of the flood. We did the office work, Wayne Wyckoff and I.

From there, I might just as well tell you some of my work background with the department. It was not until 1930, about three or four years, that I got into the main office. I was out in the field; single man, single at that time. And I went from the-- That was in '27. In '28 and '29 the department found that they had rights to water from the Mono Basin, and they had capacity during the dry years when there wasn't sufficient snowpack on the eastern

Sierras to fill the [first Los Angeles] Aqueduct 440 cubic feet per second. So they were looking for another source, or additional source, to fill the aqueduct, and Mono Basin was the logical location. So the department sent me, along with Milton Anderson, who was an engineer and a University of Oregon graduate, up there to survey the area.

Now this area, Mono Basin, had not been surveyed before, as was true of most of the mapping that was done for the Colorado River locations. I might revert back to that a little bit. The maps that were prepared produced, I think, on the order of fourteen or fifteen separate routes to bring the water from the Colorado River into the coastal basin here. The one that was finally selected with the large pumping stations there was selected after MWD [Metropolitan Water District of Southern California] was formed, which was 1928. I'm kind of really getting a little bit off course. Well, the routes that were selected-- There was one route that was an all-gravity route, but it required so much tunnel that the cost was just prohibitive. The "Old Chief," [William] Mulholland, saw the need for additional water supply if this area was going to grow as it has grown, and that's the reason he filed for additional water on the Colorado River--this was for Hoover Dam, of course. The Colorado River was murky and heavily laden with silt to the point where one of the

survey chainmen went in swimming in the Colorado River after he came back from his fieldwork, as was customary for a lot of the boys who were on the survey parties, but he forgot to take his clothes off. Usually when you would swim in the Colorado River you would go in with no clothes on, because it was so ladened with silt that it would get in your clothes. No matter how strong a swimmer you were it would pull you down. And this boy drowned because his clothes got filled with silt and he wasn't able to swim under that additional load. But the Old Chief had an idea that if you dig a ditch alongside of the Colorado River, maybe ten or fifteen feet below the normal level of the river, then the water would seep through the sands along the river. And then you would pump out of this long ditch into an aqueduct and you would thereby get rid of this silt. This was before Hoover Dam. So he set about having crews go down there with shovels, steam shovels, and dig a ditch--and the ditch is there today. I think there has been some effort in the last few years to have the ditch filled, but the error that the chief made, of course, was that, yes, it would filter out the silt, but there was no way to backwash in order to clear out the filter and make it operative again. And, of course, it didn't work out.

BASIAGO: You're saying the ditch became polluted or the filter medium?

NELSON: The water that did filter from the river, it being fifteen feet below the level of the river, gravity would force it through the sides of the river into this channel, yes. But it wasn't very long before the filter--itself the size of the channel--became clogged with the silt. So in order to make a filter work there must be some way to backwash it, to take the filtered material out and dispose of it. And, of course, that wasn't possible.

Well, I think I should go a little further on with my experiences with the Colorado River Aqueduct. The Chief was so sure that the city of Los Angeles was going to proceed with the construction of the Colorado River Aqueduct that he knew that the longest--after the route was selected--he knew the longest, in the sense of time for building the aqueduct, would be the San Jacinto Tunnel--some, I think, thirteen miles in length. So he had already cleared the heading--he found the location where he sent us into the tunnel would be. He cleared the heading for it and was getting ready to send miners in to start driving the San Jacinto Tunnel when the Saint Francis Dam disaster happened. At that time the people were so incensed about the failure of the dam that they lost, let's say, confidence in the city of Los Angeles to proceed with the project. And that's when the formation of the Metropolitan Water District was made. There were thirteen cities that

joined to form the Metropolitan Water District in 1928. (This was after Saint Francis Dam disaster in '27.) And they took over the job of preparing the maps, the selection of the routes, and the location of the pumping plants along the selected route for the Colorado River Aqueduct.

So the Metropolitan Water District then was formed with headquarters in downtown Los Angeles at Third and Broadway. The men, the engineers that were then on the Colorado River Aqueduct section of the city of Los Angeles payroll, had a choice of either going to this new organization, Metropolitan Water District, or staying with the city of Los Angeles. A number of my fellow engineers at that time went with the Metropolitan Water District and continued on that work, but I decided to stay with the city of Los Angeles.

That's when, as I said before, they sent me up to-- Prior to that I had been sent up to survey the flood-control damage along the Santa Clara River and also estimate the replacement necessary to bring it back to what it was prior to the flood damage. But when that job was completed we were sent up to Mono Basin, I along with Milton Anderson--there were just two of us. When we went to Mono Basin to map that whole area we stayed at a rancher's farmhouse, at the Farrington ranch. Ethel Farrington and her husband. And her brother was also

there, Archie Farrington. He was an elderly man. We stayed there and worked out of the Farrington ranch to set the various triangulation points and turn the angles necessary to prepare plain table sheets, so we could map it and decide where the aqueduct in Mono Basin [Mono Craters extension of the first Los Angeles Aqueduct] would be and where the tunnel would be. Because we realized we would have to drive a tunnel to the upper reaches of the Owens River, and then also to the location of the various catchment basins of the reservoirs in the basin, in order to get the winter and spring runoff and divert it through the tunnel into the upper reaches of the Owens River.

BASIAGO: Why don't we pause momentarily at that point. One thing that is very interesting in what you have said thus far is you seem to make a connection between the formation of the MWD and the San Francisquito tragedy. I don't find that so much in the literature. What was the feeling then? Was the MWD formed more in response to the dam disaster than to the desire to bring water from the Colorado River?

NELSON: The idea of-- The city of Los Angeles is some 440-something square miles. Probably one of the largest, if not the largest, cities in the United States in terms of area. And the reason it's that size is because the city charter, as it was so worded, stated that the city owned

the waterworks. They owned the aqueduct to Owens Valley which they had built in the early 1900s [first Los Angeles Aqueduct], and they could not sell or provide water to any area outside the city. So as the wells became dry, you might say--in some of the outlying areas they were dried up to some extent--the people in those areas realized if they were going to irrigate their farms or provide domestic water, they better annex to the city of Los Angeles. And at that time it appeared as if the city of Los Angeles would eventually be the size of the county. They would annex; they'd take in Long Beach. They'd take in all the beach cities: Manhattan, Hermosa, Redondo, probably Santa Monica. They'd all have to be annexed to the city of Los Angeles in order to provide water supply.

But when the dam broke, it raised the question in a number of people's minds whether the city had engineering competence and capability to manage such a large project--in spite of the fact that they built the Owens River Aqueduct. So that's when the surrounding cities--Burbank, Glendale, Pasadena particularly--decided to form the Metropolitan Water District and join with Los Angeles in order to provide a proper tax base to fund a bond issue that would be necessary in order to provide funds for the construction. At that time when it was formed, there was a large reclamation project in Mexico being done by the

Department of the Interior of the United States, and it was being headed by Frank Weymouth, who later became the chief engineer of the Metropolitan Water District.

The city of Los Angeles, being the larger member of the Metropolitan Water District, employed Weymouth and a group of men that came with him. There was Bob [Robert] Diemer, who eventually became general manager and chief engineer of the district; and there was a fellow by the name of Munn, who was a cost specialist on construction projects; and there was Elder, Cliff Elder. Elder was a hydrographer. He made extensive studies on a lot of the rivers in the United States and knew the length of drought periods and the maximum and minimum flows. He had also done a lot of research on tree rings to see if there was any cyclic regularity that would permit you to estimate. Because in taking water from a large river like the Colorado River there would be periods of time, maybe several years, when--which is of course occurring now--when the snows in the Rockies and the upper reaches of the Colorado [River] produce above-normal flows. That is, of course, very important in sizing the aqueduct that you're designing, as to whether you design it for the maximum or the minimum or the median or whatever it was.

Anyway, these men came from a previous experience on this type of work in Mexico, and they were hired by the

city of Los Angeles on their payroll prior to the actual incorporation and formation of the Metropolitan Water District. The act of the state legislature which created the Metropolitan Water District, it's the Metropolitan Water District Act. It's a Metropolitan Water District Act which permits-- Which wasn't possible until the act was passed, municipal entities could not join together and jointly fund a water project, and this made it possible to do that. Now there have been, since 1928 there have been a number of groups of agencies and cities joined together so they would have a tax base to fund a project which was a water project. But none of them have made use of this one act. For some reason it wasn't, they thought, to their advantage. For example, San Diego County Water Authority is a separate act of its own.

BASIAGO: During--

NELSON: There's one interesting fact I should mention. That is that when the Owens River Aqueduct was being designed and coming actually into reality, the city of Los Angeles employed the best engineering talent that was available at the time. A former engineer of the New York City water supply--which was an old water supply system--was on that board, and there were three boards. And the interesting thing about the original aqueduct, the Owens River Aqueduct-- E. A. Bayley, who was my boss, an engineer

and an attorney, which was quite to his advantage and to the city's advantage as an engineer-- And coincidentally, I recall the person that interviewed me for my first job was Bliss, H. P. Bliss. He was in charge of the drafting room, I think, at that time (to digress just a little). But Bayley was a young engineer at that time. This is in 1903 or '4. This board and the Chief [Mulholland] called Bayley. And Bayley told me this. They were trying to figure out the cost of the aqueduct and how much the bond issue should be. They called him in and told Bayley, "You go over to the county clerk's office and you tell me what the assessed valuation of the city of Los Angeles is and come back." And he came back with a figure and the Old Chief says, "That's the estimate of building this aqueduct from Owens Valley."

BASIAGO: The same amount as--

NELSON: The same amount as the maximum assessed valuation. Now that could be checked pretty easily, but that was-- [pause] A number something like 22,000,000 fixes in my mind, something like that but--

BASIAGO: I recall that from the lecture.

NELSON: And the strange thing about that is that the original aqueduct from Owens Valley was, we'll say, \$22,000,000, and the bond issue to build the Colorado River Aqueduct was \$220,000,000, and the bond issue to build the

California Aqueduct was \$2,200,000,000. That's a strange--
Just happenstance, of course.

BASIAGO: That they were, the cost was--

NELSON: Of course, the cost naturally would be accelerated
by inflation and other reasons. And, of course, what was
to be done? I mean, what the project itself consisted of--

Another strange thing I want to mention is that the
Colorado River Aqueduct, when it was completed-- It wasn't
until, I think, 1965, or something in that general area,
that it ever flowed to its fullest capacity for the first
time. The very day that the aqueduct was completed so that
water could be pumped from the Colorado River into the
south coast basin was December 7, 1941. In other words,
the start of the Second World War. The water was available
to the point where the navy built us an aqueduct from San
Diego up to the west portal of the San Jacinto Tunnel to
provide that naval installation which grew, of course,
after our fleet was destroyed in Honolulu. The fact that
there was water available in sufficient quantities, in my
opinion, contributed tremendously not only to the
development [of Southern California], but to the successful
prosecution of World War II. Because Southern California
then became the industrial center for military supplies and
equipment that it now is. Just as fate would have it. If
there hadn't been sufficient water available for these

military installations and manufacturing plants they would have had to look elsewhere. And it contributed, I think, substantially to the successful prosecution of World War II.

BASIAGO: Did that connection to supply the armaments buildup in San Diego happen intentionally as part of the war effort, or are you saying it just came in on time?

NELSON: It came in on time. If it hadn't been available they wouldn't have been able to have the development that occurred here take place. It would have been someplace else in the United States.

BASIAGO: What in the natural evolution of the water supply suddenly became available in December of '41? Was it the full amount? What in 1941?

NELSON: They had completed Lake Mathews. They hadn't completed the distribution system internally, but the navy actually paid for and built an aqueduct from the western portal of the San Jacinto Tunnel down to the San Diego area, which, of course, then assisted them in prosecuting the various establishments that they had to rebuild the navy. Well, I've rambled in here.

BASIAGO: Let me ask you one brief question. That is about the three aqueducts costing progressively ten times as much. Do you think it's possible that that arose from the fact that the city was growing exponentially and that

growth was directly tied to that water supply, so it's kind of like an organic progression of some sort?

NELSON: Yes, I think so.

BASIAGO: Rather than just a coincidence?

NELSON: Yeah. I think that's right. In other words, if there had been-- I don't believe that you could build today with the various--I don't want to say environmentalists-- various thoughts as to transferring water from one watershed to another. You would be stopped. You couldn't get the permits through for the rights-of-way. You couldn't build the Hoover Dam today. You couldn't build the Colorado River Aqueduct today. You couldn't build the transmission lines that go across public and private lands, because they're unsightly and they don't lend themselves to the surrounding terrain. I don't want to use the word environmentalist, but it's--

TAPE NUMBER: I, SIDE TWO

FEBRUARY 7, 1986

BASIAGO: Let's go back to your engineering work in the twenties. At that time you were surveying these various routes in the Mojave triangle. What were some of the routes that were considered? How many were there? and why was the one selected that was selected?

NELSON: Well, from the Colorado River?

BASIAGO: Yeah.

NELSON: Well, obviously the all-gravity route, which would have meant a dam upstream from the Hoover Dam, was too expensive with the tunneling methods that were available at that time. It was just completely out of reason, but at least there was a line that was suggested and considered as an all-gravity route with no pumping. So the one that was selected was one of the better routes, of course. I personally favored a route that was down near Picacho near the Imperial Dam, one that skirted the--a little more lift, but not the extensive tunnel work that the present route has. But that's history. I mean, that's the one that was selected. They selected a dam site at Parker Dam, and as I mentioned, I spent one summer down there and we stayed in a hotel at Parker Dam. But the dam itself is--they'll tell you--is an upside-down dam. Three-quarters of the dam is below the surface of the ground. They had to go that deep

in order to find solid material that was adequate for the foundation of a dam on a river the size of the Colorado River. That was selected by a group of engineers after the Metropolitan Water District was formed, and they built a large relief map which you may have seen. I think it's on exhibition.

BASIAGO: It's at the [California] Museum of Science and Industry, I believe. You're speaking of a large topographic map which was built in the twenties. Was that your--

NELSON: Well, no.

BASIAGO: --personal project?

NELSON: Well, actually, the fellow that did that was Cliff Youngquist. Cliff Youngquist took those sheets of masonite, I guess it is, and jigsawed each one of them out--with the help of others, of course. Cliff Youngquist was a graduate of the University of Washington and a very, very able engineer. He was one of the few men that I knew at that time that could handle calculus as if it was a multiplication table. A lot of people have taken calculus, but it hasn't been a useful tool in their engineering practice generally. Of course, with the day and age of computers and other things, it's an entirely different atmosphere that you're working in.

BASIAGO: Let me ask you something reflecting on the

progression of you and your colleagues through various career opportunities. Having interviewed some of your colleagues, such as Robert [V.] Phillips, Gerald [W.] Jones, and Gerard [A.] Wyss, it seems that the men who advanced to the upper echelon of the department entered, I would say, with desk jobs or jobs handling information quite early. Do you think that had some connection to their ultimate progression up the ladder? For instance, you mentioned that it seems like five years after joining the department you were already sitting at a desk taking the reports from a survey, and Gerry Jones was directed from tunnel work to handling legal files on the Burbank-Pasadena dispute very early. Do you think that was lucky or fortunate that that happened?

NELSON: The chief engineers of the water systems have been almost historically--I don't think we've had any exception--from men who have had experience in Owens Valley. Now the experience that you gain in Owens Valley is not only the operation of the aqueduct from the northern end, but you're managing some maybe, what, 300,000 acres of agricultural land. You're dealing with leases. You're dealing with crops and water requirements on various crops. And you're also running a couple of domestic water systems in the valley, as well as some, oh, I don't know, in the order of thirty or forty wells that are pumped during periods of

drought or periods of lack of snowfall. In other words, the whole gamut of water supply is under your supervision. In addition to that, you are 250 miles away from headquarters, and if the aqueduct breaks, you and your men have the responsibility of determining what to do. So the personal, on-the-ground knowledge is-- You get a good schooling, rather than when you're in headquarters down in Los Angeles. There are so many other things and so many other people that you have to confer with in order to make a proper decision. So, I think we started with the Chief [Mulholland], who was the head of the aqueduct, and then [Harvey A.] Van Norman, and then I guess I came in there. No, there was a Goit who had been brought up in the distribution system, Lawrence Goit, and he was deceased and I came in; and then Jack Cowan, and then Phillips, and after that was [Paul] Lane, and now [Duane L.] Georgeson is head of the water system. So they don't come generally from the street mains and domestic service, in-city background training. Why, I don't know.

Early when Georgeson and Lane came to work, they weren't advancing as rapidly as they would like to have advanced. Everybody has an idea how you first become an assistant, and then you become an associate, and then you become a principal, and then a senior. And then you're given an examination and then you pass, but there are only

one or two jobs open and the list dies, and you take it again. I spotted those two guys early and I did a lot of Dutch-uncle talking to them about how this was a place to make your career. Actually, the department has been the training ground for a good many of the water managers of the surrounding cities. If you'll note, the heads of the water department in Pasadena [City of Pasadena Water and Power] and most of these [men] were at one time with the department, and later opportunities came up for them. I might just make a side comment. Jane, the receptionist out here, said she worked-- She got in a half-hour early. No problem at all, just bing from Northridge. So I had a chance to chat with her. She said before she came here she worked for twelve years in a doctor's office. And she says, "I'm like I'm on vacation. I never saw so many nice people." And I said you'll find that true in the water field throughout the world.

BASIAGO: Do you think it attracts a certain special breed of people?

NELSON: Water is something that, let's say, gets into your blood. You are providing a service. You get to the point where you pass a guy on the street and you know that when he takes a shower in the morning he has no idea where that water came from. And you get a certain amount of satisfaction, you see, because water is free. There is no

cost for the water. They charge quantity-wise, but water is free. All you're paying for is the service of bringing it to where it is, to where you can use it. That is what you get thinking about, and you're doing something that the guy on the street couldn't get along without; but he doesn't know the problems that are involved in actually getting this supply to him and keeping it reliable. While the electric people are entirely different. The water man, if he finds a new way of doing something, fixes it; he'll tell everybody. But not an electric man. I think the reason for that is that electricity--we don't know what electricity is. There's something that comes through a wire and lights a light. You flip a switch, but you can't put your hand on it. It's something that's generated someplace and provided--

BASIAGO: Are you saying the fact that it's in the invisible realm of the electromagnetic spectrum tends towards secrecy or encourages--?

NELSON: I think so. I think so. They are, I don't want to say jealous, but they're very protective about their knowledge of things.

BASIAGO: So it's more like a priestly craft than a public--

NELSON: That's maybe a strange comment but--

BASIAGO: Do you think it's because electricity generation involves real cost? In other words, you have to burn

petroleum in a steam plant, or something, rather than water which requires--

NELSON: It may, but water you look at as--you could take a bucket and go down to the Colorado River and bring it back to your car if you really wanted to do that. But electricity--there's no way of getting it unless you have some mechanical machinery that'll produce it. That puts a little bit of mystery in the element itself, and is the difference between water and electricity.

BASIAGO: Do you recall any instances when you were aware that certain advancements in the power field were being monopolized? Were you lobbying at all for greater disclosure?

NELSON: No, I'm talking more about the average associate or engineer in the field, not administrators or even consultants. Other people, I'm sure, have varying ideas on that same subject. You'll find water people are the outgoing friendly type of person. Well, let's get back to the subject.

BASIAGO: I've certainly noticed that. Well, we've hit some of the major areas in the 1920s. In 1931, the county-of-origin statute was developed, and at that point the department's rights to Owens Valley and Mono water were pretty well secured and not affected by it. Do you recall anything about that time, when there was that change in the

legality by which the department would gain its water?

NELSON: No. The fear of the people in the north (which largely was unfounded, particularly after legislation which is now in effect) that whenever the north builds projects that require additional water-- They have the right to take that water and use it even if it's the entire flow of the Feather River (if they develop the need for that). And that legislation is now in effect, which in a way is kind of a cloud over the state's water resources allocation of water under contractual arrangements with a number of agencies. The thinking, I'm sure, is that the development for the use of additional water in the areas of origin will not develop to that extent ever. But there may be technology developed that will make use of additional water supply in the future and might at some time make it difficult for the [California Department of Water Resources] to prove up on its contracts with the various member agencies.

But the effect that it had on the thinking at the department, in my opinion, was all favorable. I think Rex [B.] Goodcell, one of the city attorneys working for the department at that time, was instrumental in bringing about legislation of that type--even if it appeared to be contrary to the best interests of the city. The city purchased all of the littoral land around Mono Lake for the

express purpose of not being faced with lawsuits from lands privately owned, or even owned by the [Federal Bureau] of Land Management or the federal government. The water would recede in Mono Lake. It didn't take a large amount of study to determine that when you divert the major flows of the four major contributors--the Rush, Parker, Walker, and Lee Vining creeks' water--out of the basin, the lake has to recede. In fact, the history of all of those lakes from Salton Sea clear on out through the Inland Empire and China Lake, clear on up to Lake Pyramid on the eastern Sierras--geologically, they'll all become dry at some point in time.

BASIAGO: Why is that? I know that Pyramid is a very volcanic terrain.

NELSON: They were at one time freshwater lakes. All of them; even Mono Lake, when it had an outlet. But, geologically, it has receded even without the diversion. In 1928-29, when Andy [Milton Anderson] and I were up there, it was still receding, because it already receded from the outlet over by Mills Pass where it did have an outlet at one time. So even with no study, Georgeson will tell you that it will finally stabilize itself at maybe another five feet or some number below the present level with the present diversions that are taking place out of the basin. I think geologically, over the next ten thousand years or more, they'll all become dry, unless

there is a definite climatic change of the relationship between the arctic and the temperate zones. We don't know what's going to happen, but the trend is that we at one time were in an ice age, you know, but that's passed and we're still experiencing a very temperate climate. And it will become more temperate.

Well, we're getting a little bit afield here. But as far as this legislation of areas of origin is concerned, the city in their filing and with their work with the legislature and the state department of water resources complied with all of the necessary requirements in order to protect the right to divert the water that they're diverting. There has been subsequent legislation and there have been subsequent suits. There are new theories being promulgated on the best use of water, whether it should be divided among people and animals, or people and plant life, and that's a new thought that has been--

BASIAGO: What do you think? What do you think the priorities should be?

NELSON: I think the priorities are people.

BASIAGO: People, and then what's second? Farming?

NELSON: Second is food, yeah, and then the third is the wildlife. They'll make it somehow or another regardless. This seagull thing is ridiculous, absolutely ridiculous. But they made a lot of people believe those things.

BASIAGO: Let me ask you something: In reviewing the history of disputes over water in California, I've noticed that there has evolved a kind of regional rivalry between Southern and Northern California, and some bad feelings. Most recently Northern California blocked the Peripheral Canal, which casts into doubt San Diego's water future in light of the diversion of 50 percent of the Colorado River Aqueduct water to central Arizona. Can you trace how that all happened? How was Northern California alienated? What's the basis of their antagonism? It seems that at certain times they were more allies than antagonists. For instance, Clair Engle of Redding helped fight for the Colorado River water. Do you think any mistakes were made in north-south relations in California?

NELSON: Well, I believe the human nature of people is to be jealous of a person who is more affluent, or has something more than he has to the point where he can become angry about your-- It's a trait of human nature to want more, I think. Southern California has been successful. The city of Los Angeles has been successful in providing water and electricity for its inhabitants. The surrounding areas are jealous of the bigness of an organization. They may not sometimes outwardly know it. To the point where everybody dislikes Southern California because they're successful. Northern California dislikes Southern

California because they're able to do things--San Francisco dislikes Los Angeles--because they're able to do things they can't do, or haven't been able to do. So everybody in the United States hates California, and everybody in the world hates the United States. Same reason: "Why can't we be like that?"

So when you say people in Owens Valley-- I was out at Hoover Dam here, Boulder City, I should say. I'd talked to a foreman out there. The foreman out there, before he became a superintendent, was being bypassed on civil service lists, and the opportunity came for him to be superintendent in the power plants up in Owens Valley. He and his wife talked it over and they decided, "We'll take it," and moved from Boulder [City] up to Bishop. They bought a place up there. They had, I think, three children in school. I think two of them were in grammar school and one in high school. They stayed there for, I think, two years and then asked for a transfer back. Why? Because the kids were being harassed at school. They were being accused of being a part of a group of people who were taking their water away from them.

Now, I lived in the Owens Valley. I was in charge of the Owens River Aqueduct and I was also in charge of Owens Valley [Los Angeles City Department of Water and Power] headquarters in Independence for a number of years. I

found that the people that really dislike intensely what Los Angeles is doing are the newcomers. The old-timers, the ones who have been there, they knew that when they sold their land to the department that they got more than a fair price for their property. The newcomers come up there, mama and papa open up a restaurant and they go broke. And, of course, the reason that they go broke is this big organization that is controlling everybody in the valley. At one time, you see, this department owned all the business establishments, everything up there. They sold them back to the people (whoever wanted to buy them) because the people that were having a business on a rented property, they had difficulty getting a loan for expansion from the banks. If you don't own your property and you're renting it from something, it puts a little different priority on your credit rating. So we sold them all back. But the people that have come up there since then-- I live in Palm Desert. It's people that are not necessarily retired; semiretired. They're going up there and fishing and hunting and really having a good time, but they're going to have to supplement their income to some extent. And when they do that, they're not business-oriented, and they just don't make it in a lot of ways. That creates a-- Somebody, you got to blame somebody. It wasn't your fault, of course, that you failed, but it was

something else. So I think that's part of it.

BASIAGO: There was a favorable rapport between L.A. DWP and Owens Valley residents in the fifties following the, let's say, the ill will earlier after the theft of their reparations by the Watterson brothers [Mark Q. and Wilfred W.]. Father [John J.] Crowley's efforts finally, I guess, began to bear fruit and were in full flower in the fifties. Then they seem to have deteriorated and there has been increasing activism in the late 1970s and the present day. So you think this isn't really a legacy of the first episode, but it's more a modern phenomenon?

NELSON: I think so, and as I say, the people that are actually the descendants of the old-timers up there are fine people, and a lot of the newcomers are fine people. I'm sure [Southern California] Edison [Company] finds the same thing in some of their holdings that they have in connection with their power developments up in the Sierras. If anything happens to a family or a group or to a community, you are very reluctant to look inwardly and find out how did we mismanage this ourselves, or what corrections should we take in order to not have this occur again. They're reluctant to do that. They're more apt to go to the press or outwardly blame "big daddy." The fellow that they can't put the finger on, that's the culprit: "If he hadn't been here I would've been all right." I don't

think the bitterness that existed back in the forties or so--when they were doing the dynamiting and that sort of thing--exists today as rampant as people would have you believe. I don't know whether Todd Watkins is still up there or not. He's the editor and publisher of the Bishop newspaper. He's a Beverly Hills boy. I've known him for many years. He may not be there, I don't know, but he was a leveling influence. Some of those people are pretty well off, I mean, as far as their ability to do what they want to do, and not pinched financially to prevent their activities. But it's a strange phenomenon in a way.

BASIAGO: Are you saying some of the more active Owens Valley residents who have taken part in this second flowering of environmental antagonism are actually more or less upper middle-class people?

NELSON: I think so. I think they are the--

BASIAGO: Rather than being the downtrodden?

NELSON: Yeah, I think they're the ones that are in the Lions Club and the Kiwanis Club, and they're doing what they can for the community: help the boys work, put in a new baseball field or something like that. They really don't have a contact with the department. And the screaming is done, I think, by relatively few people. I may be wrong. Lane would know more about that. Actually he's very close to the--

BASIAGO: Do you think, in this kind of thinking, the department becomes a symbol of a lot of things, like big government and big business?

NELSON: Yes, I do. The worst thing that could happen to the people in the [Owens] Valley would be for the department to sell off some of the agricultural lands for development. They've got some hot springs up there that could be developed. And what's happening down in Coachella Valley you just wouldn't believe. The few people that are there are restricted really by the availability of land to develop. It's just a city that can, you might say, build houses and house people, and it's limited. But if you threw that thing open-- Those mountains there are really beautiful, all the way from Lone Pine clear on up to-- Look what happened to Mammoth. That's what would happen to Owens Valley if they did that, and that would work actually, in my opinion, to diluting the attractiveness and the beauty of what the people who are there enjoy now.

BASIAGO: So you're suggesting that department ownership is serving as a check against more rampant exploitation?

NELSON: I don't think there is any question about it.

BASIAGO: What various holdings of the department are being held and preserved by the department? Is it hot springs? Is it agricultural land?

NELSON: It's agricultural. It's all the land that has

highway frontage between the cities. And also the ones that butt up against the [Federal] Bureau of Land Management, the federal lands which, of course, are at the foot of the mountains. Those streams in there you see, they could be-- I'm sure there's capital that would go in there and really be quite successful in developing resorts, because the scenery and the whole setting is conducive to that. Much more so, I think, than the Coachella Valley.

BASIAGO: When you were up in Owens Valley supervising the aqueduct, or down here in L.A. heading the department, were you ever approached by some very ambitious developers about, let's say, putting a resort up there in the springs?

NELSON: No, no. I have been approached by developers from Texas--when I was head of the water system--to be relieved of the cost of extending the water system to them. And I knew that, well, they were quite pointed about it: "I know these are the rules, of course, and you're supposed to-- But what we're doing, we're going to develop an area out here." (It was in Encino at that time.) They had the possibility of buying some land out there and they were going to develop it into housing, but they didn't want to pay for the extension of the water system into their area and into each one of the housing units. So their question to me was, "Who do I have to see? Do I see the mayor? Who do I have to see?"

BASIAGO: So they were looking at the individuals that they would have to bribe to--

NELSON: Oh sure, there was no question about it. Of course, it stopped there as far as I was concerned. They said, "In Texas all you have to do is drill a well." See what they do, they drill a well, they get water. That's what they did earlier down in the southern part of Los Angeles. They drill a well, put up a water tank, and develop water and build houses. Then they form a mutual water company. And then when they sold all the houses and they provided water for them, the mutual would become operative and they would step out and the homeowners would own the well. That's what they do in Texas, see, and they would make their profit on selling the houses. Well, that's a little off track but--

BASIAGO: Maybe we can--

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FEBRUARY 7, 1986

BASIAGO: DWP [Los Angeles City Department of Water and Power] administers water projects in six states and has a controlling block of the MWD [Metropolitan Water District of Southern California] votes. It has been said that this allows it to greatly influence western water development. Do you see any competition emerging from other areas of the country, now that the Sun Belt is booming, along with the front-range region in Colorado?

NELSON: You made a comment that they had a controlling interest of the board of Metropolitan Water District.

BASIAGO: Is that not true?

NELSON: That is not true. They have a proportionate share of the voting power on the Metropolitan Water District, which is related to the total assessed valuation of the district over the assessed valuation of the member agency. At present time the city of Los Angeles is about, I think, 24 percent of the assessed valuation of the entire Metropolitan Water District. Orange County is 18 or 19 percent. San Diego is generally in that same area. So while they have six-- Let's see, eight I guess it is. Anyway, the directors representing the city of Los Angeles only vote those number of shares that are related to their entitlement, so it's only 23 percent. They would have to

get either San Diego or Orange County, and possibly some other smaller members, in order to control or direct the policies of the Metropolitan Water District. They lost control some time ago. Originally the district was formed to provide a supplemental supply to municipalities (member agencies). That was true until they amended the act [Metropolitan Water District Act] to include municipal water districts. In other words, the beach cities are part of a western municipal water district--that's Manhattan, Hermosa, Redondo--and they have their own board and they have a proportionate number of directors, or voting power, on the Metropolitan Water District. When they amended the act to include any water agency, you might say, on the coastal plains, then that's when the city of Los Angeles lost control. That doesn't mean that even when they had control they weren't operating the policy of metropolitan district in the best interest of the district itself, not necessarily for the interest of the city of Los Angeles.

There has been, and there still is, a certain amount of friction, principally between San Diego and the city of Los Angeles. That again, I think, is the self-interest of one agency being able to do things, and the other agency not being able to do it. It makes them a little jealous of that opportunity. San Diego filed on the Colorado River and they could--prior to the Supreme Court decision on the

Arizona case--they could have built an aqueduct of their own and brought water to their area from the Colorado River. But when the Supreme Court decision was rendered, the last appropriator, of course, was San Diego and their right was wiped out. They have no right anymore. And half of the right that the Metropolitan Water District had was wiped out. And they should; it was a good decision. The unfortunate thing about it, for the members of Metropolitan Water District--who pay taxes, federal taxes--they in effect are paying a portion of the federal subsidy that San Diego is enjoying on the building of the [third San Diego] Aqueduct. That isn't all bad because I think when one adjoining area prospers due to a natural resource, the other one can't help but benefit to some degree also. You asked a question about whether there was any enmity, or whether we feared there might possibly be enmity, between, well, the southern belt.

BASIAGO: Well, there are two trends we see. One is, well, you could talk about the growth around Irvine and Newport Beach. That's going to require water. When you see that central Arizona got a large share of that Colorado River supply, and you see increasing competition for the available water now that the Pacific Southwest has become such an ascendant area, what can you foresee?

NELSON: Well, back when Stewart [L.] Udall from Arizona

was Secretary of the Interior, before the Supreme Court decision was rendered on Arizona, the Department of the Interior felt they had a responsibility to provide supplemental water for the Phoenix area. And at a talk in central California--I think it was in Fresno at a water meeting, I'm not certain of the time and the location--I remember very clearly at that time he was proposing that the Department of the Interior build an aqueduct from the northern streams in California--which we all were quite aware were flowing unused into the Pacific Ocean--down across the San Joaquin Valley, skirting the mountains which form on the north side of the mountains and down to the Colorado River and across the Colorado River into central Arizona. This was proposed publicly at a water meeting in central California by the Secretary of the Interior. I had some inkling--I think I was at that time the chief engineer of the water system--and I had some inkling this was going to be proposed. So I jumped up and made a counterproposal, which at that time became the Sam Nelson Snake River plan. I don't know whether you've got a copy of that or not.

BASIAGO: Yes, I do. And one of the questions--

NELSON: This plan required just one pump lift at the Snake River and you come down across Nevada and supplement the flow of the Colorado River with sufficient water from the

Snake River, which was now being wasted into the ocean and the Columbia River. Of course, that stirred all sorts of-- But it stopped Stuart Udall and that was my main purpose.

At that time, and subsequently, I worked with [Ralph M.] Parsons company [Parsons Corporation], a consulting firm, on a major water transfer program. I've always felt that at some point in time there will be, because water is such a vital necessity, there will be a major basin transfer system from the Yukon [River] exchanging water for the Fraser River. No one will lose because they will be using other water from other basins, but eventually the water will be provided for the areas that the people have decided to live in which we have no control over. They want a more temperate climate, they want one that is more comfortable, and that is the reason for the great migration to the Sun Belt and to this area here. And in order to provide sufficient water something has to be done. What's the name of the former director of [California Department of] Water Resources that has done a lot of work in the East, now a consulting engineer? Texas has a problem, and there are thoughts of transferring some from basin to basin in that general area.

I think the way to condition the people on the importance of this--and the real necessity is that this must come in time--is for the first step to be made with an

agreement between Canada and the United States to sweeten the Great Lakes. The Great Lakes are getting polluted and they are going sour. Here is one plan that is an example. There's plenty of water in Canada that is going into the Baffin Bay or into the Arctic [Ocean] that can be diverted. Russia is doing it now on the Volga [River], because the Volga has so many manufacturing plants and the Caspian Sea was becoming polluted. It's just because people are not properly informed. If this is done properly, it would be to the benefit of everyone; even those that the water is being diverted from at the source like the Yukon or some of those rivers in Canada.

BASIAGO: What would be the benefit to the Yukon region?

NELSON: Well, the climate is such that it isn't conducive to anything, except maybe resource development.

BASIAGO: So they do--

NELSON: The polar bear, they might have a little problem up there. The caribou, I don't know, but that could be taken care of some way or another. The important thing is that there's sufficient water; you don't have to divert it all. There's sufficient water that is now being wasted into the oceans in North America that could be put to beneficial use if it was done orderly, intelligently, and with the proper funding. I think that the first place is Canada, and then the United States--the Great Lakes. The

reason I say that is because after they find out the benefits that accrue from such a proposal, then they say, "Why can't we use some of the water that's going down the Columbia or Fraser River or the Yukon?" But not in my time, probably not in your time, but it has got to come if the people insist on living in temperate zones that don't have an adequate water supply available to them.

BASIAGO: You mentioned sweetening the Great Lakes. What would you do? Would you take water going into Baffin Bay and the northern reaches there and pipe it--

NELSON: Sure, sure.

BASIAGO: --down south through Canada and then just dump it into the Great Lakes?

NELSON: That's right.

BASIAGO: And that would just--

NELSON: Yeah, that would just dilute--

BASIAGO: --dilute the polluted water?

NELSON: And find some way to control the origin of the pollutants. That has to be controlled. You don't just solve a problem by augmenting it and diluting it. These Great Lakes will not be saved by putting restrictions on discharges into the lakes now by the various manufacturing plants or cities adjoining it. It's being done in Canada as well as in the United States, but that won't solve it. If you put additional water in there to dilute it, then you

can come to a balance, in my opinion.

BASIAGO: So you're saying that if harsh discharge measures were enforced, it would still require it to be flushed and diluted.

NELSON: Sure, sure.

BASIAGO: Might people argue that the landmass of Canada has always served us somewhat of a pollution break, with its rather pristine northern waters between the landlocked Great Lakes and bordered by that great industrial region. Wouldn't the great struggle be by those who would stand up and say, "Well, you're just going to be polluting more water by directing it south to the Great Lakes."

NELSON: Well, there would be, of course, many, many problems that would have to be worked out. But the present situation as it now exists, in my opinion, can't help but get worse, and anything that you could do, I think, would be of benefit. It would be done for a price. I mean, Canada wouldn't be giving anybody anything.

BASIAGO: What would they get in return? What would the trade-off be?

NELSON: Well, maybe actual money.

BASIAGO: Money to develop their natural resources?

NELSON: Yeah, develop areas they can't develop now because of lack of funding. They have tremendous areas that are, as you say, pristine and are being encroached upon.

They've got to put up barriers and restrictions on areas within their own country.

BASIAGO: What industrial activities do you think they'll become involved in that they need funding for?

NELSON: Well, they manufacture a lot of articles now which they export to the United States. I don't know particularly what they are, but I'm sure it's quite a bit, in addition to the agricultural lands which they have. There must be some manufacturing. In fact, I think some automobiles-- General Motors has a plant up there. I'm not certain, but I think around Lake Erie they have some kind of industrial plants.

BASIAGO: Let's go back to the Snake River Project. Was that solely your idea, or did that pop into your head at that meeting with Secretary Udall?

NELSON: Yeah, and I got [Duane L.] Georgeson to work out the details.

BASIAGO: It occurred right at that meeting when you heard about the--?

NELSON: Yeah. Of course, I was well aware of the quantities that were being discharged annually into the ocean from the Columbia River. What is the annual flow of the Colorado, what, 13 million acre-feet. I think the waste due to the water that goes into the Pacific Ocean from the Columbia is something in the order of four or five

times that. A small quantity of water from the--we're talking about an aqueduct the size of the Colorado River Aqueduct from the Snake down through Nevada. And it would develop considerable lands at the top of the pump lift in Idaho, which are now all dry-farming type of operations. So no, that was just bingo, because I knew the configuration of the Snake [River] and the Colorado [River], and I knew that the Snake dipped down almost into Nevada. I didn't know at that time the differences in elevation, but it would determine if you could have a gravity-flow and some substantial power recovery; which would, I think, more than pay for the cost of pumping out of the Snake River into the aqueduct.

BASIAGO: That was one method that you thought of to supplement the flow of the Colorado River through large regional projects. Were there any other?

NELSON; No, except this Parsons plan.

BASIAGO: This is the Ralph M. Parsons company in Pasadena?

NELSON: Yeah, which they put a lot of money into. It was basically a North American water plan--basin exchange plan. I worked with Ralph Parsons on that. He was quite a guy. He had built a wonderful organization.

BASIAGO: What were the main features of that plan?

NELSON: The main feature was starting clear up in the Yukon.

BASIAGO: That was the Yukon.

NELSON: You could never sell that plan because it would have to be guaranteed funding by the federal government. It was just too big a plan for any--even a large group of water utilities couldn't handle it. And in order to get federal funding, you'd have to get Congress to approve it. That's why I suggested that Great Lakes plan of basin transfer from Canada, which would have to be approved at the presidential level. There are so many senators whose states border on the Great Lakes, thus you have a substantial number of senators that could see benefits to their own state. You have to look at it from the political angle, as well as a practical or engineering angle. Whether it can be sold or not. Whereas anything in the West, you would only have maybe two or three states that would be involved and that would benefit from such a proposal. I think the plan to save the Great Lakes would catch on, and could possibly be done gradually. That would take a lot of studying and a lot of work, but I think, as I said before, that if we're going to continue (the United States) to grow as we have, growth will only be limited by the amount of water that is available to support that growth. And that is coming, in the next decade or so, to a critical point.

Now, if the aqueduct is not enlarged and sufficient

water provided to fulfill the contract the state has with its member agencies, Southern California is going to be faced with a serious water shortage when we cyclically go into a period of eight to ten years of insufficient rainfall and snowfall. True, the water that is being provided by Metropolitan Water District is a supplemental supply. I think the amount of water that is needed by the Metropolitan Water District member agencies--I think about half of it is being provided by Metropolitan Water District. The other half is provided by the Owens River Aqueduct, or local wells, or local supplies. But that percentage is going to rapidly change with the growth that is taking place in this coast area. So people are going to have to be made aware of the options that they have, and it's not going to be done by conservation and rationing.

BASIAGO: I was going to ask you about that. Since we are in a naturally arid region and we're so heavily dependent upon water imported from elsewhere, shouldn't conservation be a natural element of the department's business?

NELSON: Certainly, it is. It is very important; there are some pamphlets out there on the rack: plants that require a minimum amount of water or something, how to irrigate-- They're heavily involved in an educational program to do that. But people, being people, may talk it but they don't do it. Even the state itself-- You've seen I'm sure, on a

rainy day here on the freeways you'll see the sprinklers going on the freeway ivy or whatever it is that is on a timer. You'll still see water running down the gutter in a residential area by some person who is not practicing conservation. That applies to the other fellow but it doesn't apply to you. If you like a shower that is ten minutes long, you maybe step aside and let the water run while you soap yourself, and get back instead of turning it off. I mean: "Water's free and there's lots of it. What are you talking about? I'm not hurt." But the development of water, the span time to get new sources, is increasing many, many fold. You used to be able, you could build an aqueduct or a new source in ten or fifteen years maybe. Now you're talking about several decades, even after you've proven up on something.

BASIAGO: Why has it taken longer? You've mentioned the environmental legislation that sometimes forms an obstacle to going forward. Are there any other reasons?

NELSON: That's the principal reason, to get the permits and the clearances and the rights-of-way and everything all cleared, as well as the engineering end of it.

BASIAGO: What in the engineering is becoming more difficult? Has there been a drop in productivity?

NELSON: No, I think actually the construction methods have improved remarkably. It has become feasible to drill a

tunnel now under the English Channel. They've been talking about that for decades, but with present tunneling methods--that's one of the construction methods that has made substantial gains in the last few years, you might say. They have machines now that practically can go through most anything at rates that are phenomenal.

BASIAGO: You've mentioned the classic example of seagulls at Mono Lake. Are there any other facets of environmental law that you think are unnecessary or overbearing?

NELSON: Well, we know that annually certain species of life become extinct. And other forms, with interbreeding or one thing or another, are formed. That's been going on for centuries. To take steps that are costly steps, and limit development in areas for species that are peculiar to a certain area, or can become in the future, unless protected, extinct, I think is a little unreasonable. The condor here in the southern Sierras. I read in the paper the number is dangerously low. They're now capturing the eggs, and they only lay one egg every two, three, four years or something, and hatch the egg and then raise the condor and-- The condor is like the turkey; it's a scavenger. As long as there were dead cattle laying around there were more condors. If there were no more dead cattle they would go great distances in searching for food. The Andes Mountains have a very substantial number of condors--

slightly different than the North American condor. They not only thrive but they are on the increase. No problem at all. My point is that we are so protective. In the desert there's the, I think, the three-toed frog, or lizard, I guess it is, that they're trying to protect. And in order to protect it--in the habitat where they are apparently more successful in living--they put certain restrictions on developing land. You have to put aside a certain amount of land so that the-- This fish that they had, what was it?

BASIAGO: Snail darter?

NELSON: Snail darter, yeah. They found out later that it could propagate elsewhere. I don't know why it is that people become concerned about these things. Maybe it's the compassion they have for any form of life, but I think the reason man is a predominant animal on earth is because he actually was ruthless. He killed to survive in a lot of ways, and he has a superior intellect and was able to do that, and now he is showing some compassion for other forms of life that are disappearing. But I'm saying that every year there is a certain species of life that--because of changing environment, changing climatic conditions, changing of where it naturally lives and propagates, weather conditions--finally becomes extinct. We just ought to recognize that. Not necessarily encourage it or do

anything to speed up that process, but we shouldn't pay as much attention as sometimes, I think, is given to that type of development.

BASIAGO: You mentioned that man's nature is ruthless, or maybe another word would be acquisitive. Do you think that in light of such progression as increased salinity when we are tapping the water level, that perhaps man has to adapt, as he has in the past, to new conditions?

NELSON: Oh, very definitely. I don't know, but I think some of the so-called pollutants that are carcinogenic or cancer related are not necessarily as dangerous or as potentially injurious to man. I think the more you know about things, the more things you find that are objectionable. You make more powerful microscopes. It wasn't too many decades ago that we were talking about parts per million of certain elements in the water supply. Now it's got down to parts per trillion, because they've developed microscopes and methods of analyzing things where they can actually pick up that trace element in one in a trillion.

BASIAGO: Where would you draw the line environmentally?

NELSON: Well, I think man is a pretty hardy creature and I think he can adapt himself. And, of course, medical sciences-- Also with the age of people now. They tell me a person born today is going to live to be a hundred, and probably will. That creates all kinds of other problems

which we won't touch on. But as far as drawing the line on what is good and what is bad, I would have to leave that up to the medics to analyze. So much is related to our health, what it does to our physical--we're getting now into protecting the individual. Everything we do is a risk. I might get up and fall down here and break a leg or something. There is a limit to what an individual himself is responsible for. This seatbelt law, I think it's a good thing, but it gets to the point of how much of your own life do you actually want to control yourself.

BASIAGO: I was speaking of biological regions. We see farms in California going in the direction of alkali.

NELSON: Well, I think there has got to be control on pesticides. I think that this watermelon situation was an example. They took a lot of watermelons off the market and the farmers suffered from it, but they had used something that could endanger the health of the people. I think that's proper, but I think the line is drawn on the conservative side rather than on the liberal side. In other words, there are certain things that I think are not as dangerous as people would have you believe. Things that they put into foods. Of course it's getting into an area where-- But in the water supply field, Metropolitan Water District here has just spent I think \$7 million on this new laboratory out here at La Verne that is the best in the world, and the state-of-the-art. They can detect--

TAPE NUMBER: II, SIDE TWO

FEBRUARY 7, 1986

BASIAGO: What can the La Verne system [La Verne Water Quality Laboratory] do?

NELSON: Well, they can detect elements that are in the water supply and treat it to the point where--as they have stated--the water that they dispense to their member agencies is purer, or as pure, as any bottled water supply that you can buy. That's quite a statement, but they contend that they can do it. They far exceed the requirements of the state health department [California Health Services Department] and the federal health authorities in treating the water supply. This is commendable, but we may eventually come to a situation where we could have a dual water supply at every user's meter. One for domestic purposes, and one for agriculture purposes and sanitary uses in the household. It would be expensive (duplicating the distribution system), but the amount of water that is used by the average householder--cubic feet, however it's measured--only a fractional part of that is used in cooking or in drinking. So the thought, of course, occurs: "If that's true, then why does the water that is in my toilet tank, or the water I sprinkle my lawn with, why does that have to be just as pure? Why can't the standards be lowered?" And I think they could if

you had a dual supply.

In fact, all distribution systems are designed just like a freeway. Freeways are designed for the heaviest truck. If you didn't have trucks on the freeways they would save millions and millions of dollars on height limit of bridges, thickness of pavement, and a lot of things on the highways. The same way with the distribution system. The distribution system is designed to take care of an adequate fire flow. It's the amount of water that can be put on your house, in case your house burns, by the fire department from the fire hydrant down on the street which is connected to the same main as your domestic system. In other words if-- I think the city of San Francisco has had a separate system for fire flow ever since the earthquake back in 1906. They can pump water out of the bay into their fire-flow mains. Why not design a system that would take care of just the fire flow, and let them use treated sewage water? I mean this is kind of way-out, but the actual consumptive use of water is surprisingly small. Aqueducts are built and designed for the ultimate use, which is probably 85 percent or maybe 90 percent, where there is no health requirement required at all. It's only those that would affect the individual through some process as water is used to prepare something. So maybe instead of looking for additional resources--this would probably

placate people that are opposed to the Peripheral Canal and other additional water--but instead of putting all your energy in looking for additional water or figuring out some way to seed clouds to get more water out of the clouds or something, take the resources we have and look at that part of the water resources we're just throwing away through sewage-treatment plants or through outfall disposal systems. That, I think, is something that they'll have to give more consideration to.

BASIAGO: So the secondary-use water supply wouldn't require as much--

NELSON: That's right.

BASIAGO: Could be recycled without the same degree that you would need for drinking water?

NELSON: There might be more than one, two, or three uses, again and then again.

BASIAGO: And do you think that the freshest snowmelt off the Sierras could then be reserved primarily for drinking water and cooking?

NELSON: But you see, we're in a habit of getting whatever water we get and then treating it to the point of it being acceptable, instead of taking the water before it gets polluted and using that. You don't have to go through the treatment process.

BASIAGO: I was going to ask you, getting back to this

issue of regional water policy: During your tenure as general manager, your writings revealed an attempt to create regional good will and communication. Where do we stand on that? Is that greatly improved?

NELSON: Yes, I think it is. The power plant, the power developments which are tremendous--millions of dollars being invested in out-of-state power development looking toward the ultimate, I guess, shutdown on the basin plants that do use fossil fuels. It can be modified to some extent to use gas eventually. These out-of-state plants that are coal-fired, in Utah--I've raised the question, when is the other state or other community going to, in effect, wake up and say, "Now wait a minute. What we're doing here is creating a polluted atmosphere for our general region by the operation of these plants, and transporting the energy to an area that doesn't want these pollutants." What are we going to say? That doesn't sound like that is a fair shake for our region. But the economic development that has taken place, and the employment opportunities that have been provided at these new plants in Utah and Nevada, has far exceeded any objection by any local group. They just welcome with open arms the opportunity for employment and the benefits that accrue from that type of construction. I think it's a question of time, when somebody's going to say we owe a little bit more than that.

BASIAGO: I'm trying to get clear on the question of the headwaters of the Colorado. Is it true that Denver and Boulder aren't dependent on the Colorado River? That's a growing region. I'm wondering if they might some day vie for a larger portion of Colorado River water.

NELSON: The compact between the states [Colorado River Compact] could be modified with proper agreements. The fact is, of course, that the Colorado River is the only large river in the United States that is fully committed; in fact it's overly committed. Unfortunately, when [Sam] Rayburn from Texas was in Congress he was able to convince Congress, the Senate, that Mexico should have a portion of the Colorado River in exchange for relinquishing to Texas a portion of the Rio Grande--so the orange growers in Texas would be able to plant more orange trees. That's my analysis of it. Mexico has an area adjacent to the Colorado River, before it enters into the Gulf of California, the Mexicali Valley, which is an agricultural area and makes use of-- They're entitled to, being riparian to the river, a portion of it, but the amount that was agreed upon, I believe, was far in excess of what their actual requirements are for agricultural purposes in that area. Of course, the Gadsen Purchase--you know that land which takes a jog at Texas and New Mexico and comes up and makes a portion of the lower Colorado in Mexico. I believe

the surveying was in error and it was intended to include all of the lands that are riparian to the Colorado River. There's a jog in that boundary line in Mexico so that the Colorado, the whole Colorado, should be riparian to either Arizona or California, but that's not the case. That's aside from the point. But your question, let's see, what was it now?

BASIAGO: Well, Denver is very water dependent.

NELSON: Oh yeah, Denver. No, I don't think--they have a tunnel, you know; they get water from the other watershed. I think the fact of the matter is that the flow of the river, even where it leaves the boundary of the state of Colorado, is substantially lower--even if they took all of the water. What I'm saying is that the watershed, or the snow mountains that contribute, are not as bountiful in Colorado. (In other words, all the water would flow in the water in any manner. It would originate in Colorado or even in Wyoming, which is above us, so there's a lot of level.) No, I think they have developments on the eastern slopes of the Rockies. More than is necessary to take care of the development in the Denver or Colorado Springs area. The area that would probably become short in supply and seek water is Nebraska and eastern Colorado, for agricultural purposes.

BASIAGO: Given the possibility of having a domestic water

system that would separate potable and nonpotable uses, how would you go about engineering that without ripping up all the pipes and having to replace everyone's delivery lines?

NELSON: I think the cost would dictate the most economical and best way of doing it. You mentioned pipes within pipes. The hazard with that, of course, is that if the interior pipe fails, then both systems have to be flushed and the repair made before it could be put back in service. Because the potable supply would be contaminated in either event, whether the smaller pipe, in the pipe, was the potable supply. It naturally would be contaminated by the water that was in the larger pipe that it was in. I think there's room for--you undoubtedly get a lot of flak from private water bottling people--but I think the most economical way of doing it is to enter into a bottling plant and delivery to-- The price that people pay now for bottled water is so exorbitant. But the differential in minimizing your treatment facilities and making use of polluted water--which presently is wasted or not put to any use--would, I think, substantially subsidize a bottled water effort; particularly in smaller communities. I would think that small cities could save substantial money in their treatment costs. Almost, in effect, eliminating them if they went into the bottled water business. Of course, in doing that you're infringing on private enterprise and

practically driving the bottled water industry out of business in that particular area that you're going to serve. But you do--as a water purveyor and a member of the, you might say, official family of the city in which you operate in--have not only the right but the responsibility to provide the citizens with a potable supply. In fact, you as a water purveyor are the one that's called to task if you don't pass the public health standards of the state or the federal standards. (Of course the bottled water people are subject to the same thing.) I think there's a case to be made that the water purveyor, in the interests of the economy and safety for the residents, and satisfactory potable supply, go into the bottled water business.

BASIAGO: I was quite startled to find that only about 15 percent of the water in this state is used by residents, and the other 85 percent goes toward irrigation. How much of the residential water is actually used for potable purposes? About 5 percent?

NELSON: I would hesitate to put a number on it, but I would say it was less than 5 percent. I think there would be substantial savings in small communities where they have treatment plants to comply with health standards regulations. There would be substantial savings in seeing that the residents were furnished potable bottled water.

Of course, the Metropolitan Water District couldn't do that because they, in effect, are wholesalers of water. They don't serve water to individual households. There are probably some industrial plants that they are connected directly to, but I believe that their water is sold through a water district or agency in that particular area. They are purely a wholesaler. They have--what is it--twenty or so customers, and they are the ones that they bill for the water that they sell to them. And for Metropolitan Water District to have a dual system just wouldn't be feasible, as you well understand. They sell wholesale water, but of course it's potable. The reason smaller cities would have their own treatment plant is because they mix the Metropolitan Water District water with their local supply, as their local supply very often doesn't meet the public health standards. So they have to--while they probably dilute it with the potable MWD water--still have to treat it in order to satisfy the requirements.

BASIAGO: Let's say you had potable water delivered to the home in bottles. Of what quality would the water coming through the tap have to be? For instance, the quality a person would require to wash their face might be a little higher than that which they would need to water their lawn. Would there be some minimum standard of purity?

NELSON: I'm sure that would be established. It's a lot of

details that would have to be worked out. It sounds on the surface that it might be an alternative, in order to meet these increasing costs to make all water satisfactorily meet standards. The standards are gradually becoming more and more severe as new technology and treatments--as well as the discovery of elements in the water supply and the effect it has through experiments and tests on the human being--are discovered. It becomes increasingly expensive to treat the supply in order to satisfactorily meet the requirement. So it's kind of a dream, but I think it should be explored.

BASIAGO: The idea would be recycling water. For instance, potable water that, let's say, for cooking is poured down the drain would then proceed to the treatment plant, and that might come out of your tap in the shower or to water your car.

NELSON: Yeah, they've tried-- Calleguas [Municipal] Water District up in Simi Valley has a problem. They tried a housing development where they had a dual supply, one for the house and one for the irrigation--two meters. The problem immediately arose, what's to prevent, with the sprinkler system working on your lawn not using potable water, your next-door neighbor's kid from coming and putting his mouth over the sprinkler head. He'll be able to have damages against you, because you're responsible for

some disease that he contracted as a result of that.

It does seem a shame that you have to treat the-- First the water that comes down the aqueduct, the California Aqueduct--not even the Colorado [River Aqueduct]--does not meet the public health standards without some treatment. At the source before this water got polluted into the aqueduct it seems a shame that you have to pollute pure snow water and then treat it in order to make it satisfactory. It seems we're doing the thing backwards. We should take the acceptable water and put it to beneficial use for the purpose that it's intended, without any treatment, and then take the polluted water and put it to some use where it does not require human consumption or human contact with it. Our emphasis, as I said before, has always been on going out and getting more. They built the Owens River Aqueduct [first Los Angeles Aqueduct]. They built the Colorado River Aqueduct, and still that wasn't going to be enough for the future development for the coastal plain. So we contracted with the state to build the California Aqueduct.

Still we're after more water, and at the same time we're treating all supplies. Even the city of Los Angeles now has put a filtration plant at the end of what we thought at one time was nothing but pure snow water. It came from the eastern Sierras, the watershed. But no,

there are certain elements in it, according to the state health department, so that it's got to be filtered. I don't know if it's in operation yet, but very soon it will be in operation. It seems our emphasis is in cleaning up what is polluted, rather than trying to get the unpolluted supply to the consumer--which just sounds reasonable. But all our emphasis-- As you know, we'll go to another watershed and bring water down. When you get it here where you can put it in distribution systems and retail it to people, you have to treat it before that because it doesn't meet the standards. We just go out and get more and we treat it. Well, so much for the treatment of water supplies. It's going to be never-ending I think.

BASIAGO: I want to ask you about your tenure as general manager in the sixties. During that time, and into the seventies, Los Angeles experienced explosive population growth. In '61, when you assumed the directorship, you began a construction program involving more than \$1 billion in facilities, and the department was projecting a population growth in L.A of three-quarters of a million citizens. Did the population increase eventually outstrip the construction outlays?

NELSON: Yes, except the construction outlays had sufficient "overages," you might say, in them that they were able to provide the necessary facilities so there was

no interruption or delay in any of the services that were required. Of course, when they formed the Metropolitan Water District, as I mentioned before, they built a Chinese Wall around the city of Los Angeles by the mere formation of the Metropolitan Water District. Because now an entity outside the city of Los Angeles no longer had to annex to the city in order to be assured of an adequate water supply. All they had to do was to form--with other water agencies in their immediate area, outside the city of Los Angeles--a district and join the Metropolitan Water District, and the Metropolitan Water District then would wholesale them water. So, then the territorial growth of the city of Los Angeles ceased when the Metropolitan Water District was formed.

At one time the people doing the planning for the future requirements of the Department of Water and Power assumed that all the area in Los Angeles County, with the exception of that north of the mountains, would eventually be in the city of Los Angeles. That's the reason--maybe Gerry [Gerard A.] Wyss told you--that Baldwin Hills Reservoir was built. That's also the reason it wasn't necessary to rebuild a similar reservoir in the same general area, or a water-tank farm or something, to provide an adequate water supply. Because the use of water fluctuates hourly practically, and you have to have

reservoirs in the system in order to take care of that fluctuation in demand. But when the Baldwin Hills Reservoir was built, it was assumed that the whole central basin, west basin, would eventually be annexed to the city of Los Angeles. There was need for a reservoir at that elevation to maintain daily fluctuations, and even in some instances seasonal fluctuations for that area. After the reservoir was built, then the law was changed so that the Metropolitan Water District admitted municipal water districts and included county territory, and maybe three or four or more city areas in that area that would join together and provide water for their particular area.

BASIAGO: You headed the construction of the Baldwin Hills Reservoir Dam and were general manager when it ruptured. What do you think happened? What was the problem there?

NELSON: Well, I'm sure that you found from other individuals that you have talked to that the reservoir itself was the last in the art of earth-filled dams, the highest technology available. It was not only compacted to the requirements that were generally known and accepted at that time, but the whole reservoir then was covered with a film of plastic material so there would be no leakage--if there was, it would be minimal leakage--from the water in the reservoir to its embankments. The thing that happened, and it later was resolved in agreements with the Standard

Oil Company [of California] who had extensive oil drillings in the adjacent canyon to the west. It had been apparent that the oil in the field--like other fields in the general area, notably the Wilshire area, which was at one time a series of oil derricks back in the early twenties--was gradually being depleted. The way they would get additional oil out of the field is to inject water into the field, and as we all know, oil is lighter than water and it floats on the surface. So they put a number of injection wells into the field adjacent to Baldwin Hills Reservoir to raise the oil level, so they could extract more oil out from the field than they would have otherwise. It was assumed that they used excessive pressure in injecting water into these oil fields and at, we'll say, weak places in the general area--which would force oil up to the surface.

Prior to the failure of Baldwin Hills Reservoir, it was brought out in the testimony that there was oil running down the gutters on La Brea Avenue from the seepages of oil, which were caused by the excessive pressure as they were injecting water into these fields in order to raise the surface of it. While it wasn't definitely proven, one of the theories was that these weaknesses in the earth surface showed up on the north embankment of the Baldwin Hills Reservoir. There was a large drain that was built

down that canyon where the houses have been built, and that pressure from the oil caused a breach in this film that was on the surface of the embankments, and caused a path for the water to come down. It eventually eroded the embankment away, and of course, the whole embankment failed and released the water down the canyon.

My first knowledge of it was from an employee who worked for me, Bill [William] Tate, who was a field man and lived in the area. He lived, I think, down in what they call Green Acres. It was a housing development at the foot of this Baldwin Hills Canyon below the dam to the north. He was out on a walk and he noticed the water running down the gutter on that street below the dam, and he thought it was unusual. He knew the reservoir was up there, and he didn't see any sprinklers on the lawns or anything that would contribute. It was a water leak of some kind. A water main, or what it was, he wasn't sure. He reported it, and we at that time sent a group of engineers out to inspect everything. Fortunately, it happened on a Saturday and it happened in the daytime so there were very few people asleep. A lot of people were up and around and that certainly reduced the fatalities to a bare minimum. I think there were three; two women, and a man who had left his home. He was, I think, a meter reader for the department and went back to his house to get some effects

and was caught in the first wave that came down the canyon,
which was an unfortunate thing.

TAPE NUMBER: III, SIDE ONE

FEBRUARY 7, 1986

BASIAGO: You were mentioning that, in terms of state-of-the-art technology, you stand by the construction of the dam.

NELSON: That is correct. It was later proven in the suit that was filed against the oil company [Standard Oil Company of California], and there were extensive hearings in which I was one of the principal witnesses. The oil companies eventually assumed the responsibilities. The department [Los Angeles City Department of Water and Power] was insured against this sort of catastrophe. The insurance companies had provided insurance at different levels of insurance so that if the damage claims amounted to, let's say, \$50 million, and the department was insured for a \$100 million-- The insurance at that time was so written that any insurance company above the \$50 million was free and clear as far as any liability in connection with the enforcement of the policy they had with the department. Because he was just for that layered amount above the amount of damage that was claimed, the chief counsel for the department, Gilmore Tillman, spent hours with the state insurance-- What do they call them?

BASIAGO: Adjusters?

NELSON: No, the state insurance man who regulates all

insurance and sees that they properly qualify, and that sort of thing, in order to do business in California.

BASIAGO: Board of equalization?

NELSON: No. It will come to me maybe. They worked it out with the insurance companies so that each insured company would take his proportionate share of the responsibility in paying off the claims. So they were equally divided among the insurance companies, which was a giant step in insurance against liability for such disasters, and future insurance was so worded. Prior to the collapse of the north embankment, my assistant, Max [K.] Socha, was on the scene, as was Gerry [Gerard A.] Wyss, who at that time was in charge of the distribution for the water system. They made every effort they could to actually close the breach, because there was a spotty amount of water coming down the canyon but the embankment itself had not failed. I was at home at the time and I was in constant contact with Bill [William H.] Parker, then chief of police. He was suggesting and wanting to know whether the dam would eventually collapse, and if it did, should he--and only he had the authority--order the evacuation of the homes that were in the path of this impending flood. It was really a mammoth decision that he made, really on his own--but based on the information that he had available from my assistant, as well as other staff people at the site--that eventually

the whole thing would collapse. It took several hours before it finally eroded enough so that the whole embankment collapsed and the water came down the canyon. It was fortunate that it happened on a Saturday and it happened about noon. It was due, as it was later proven, to the exploration of oil fields beyond what was at that time safe to do.

BASIAGO: Thirteen billion dollars was paid to--

NELSON: What was it? Thirteen million dollars.

BASIAGO: --thirty-seven hundred claimants. Did this policy of conciliation and cooperation among the insurance companies prove less costly to the department than a more confrontational approach might have?

NELSON: Well, I don't think there was any difference in the liability that the department eventually assumed or incurred, but it made a much better feeling among the insurance companies themselves as to how and where the liability would actually lie, you see. They eventually collected a substantial amount of that from the oil company, as the insurance companies held the oil company [liable] for the damages that were incurred.

BASIAGO: One of the great works that you were advancing while general manager was the Bolsa Island nuclear power and desalting plant, which was to be constructed on a man-made island off the Southern California coast near

Huntington Beach. Whose idea was that, and what do you remember about the early days of that plan?

NELSON: Well, the Metropolitan Water District [of Southern California (MWD)] was heavily involved in that because they would make use of the water that was desalted. The venture which should have come to fruition, but did not, was the one up in Malibu.

BASIAGO: Corral Canyon?

NELSON: Corral Canyon. Bill [William E.] Warne, who was then the director of the California Department of Water Resources, and I were very anxious to build a desalting plant someplace and to prove that it was a viable means to get additional water supply. The only way, at that time, that would be viable was to combine it with a nuclear power plant. The department would build a nuclear power plant and provide the necessary energy for the desalting plant at Corral Canyon near Malibu. We had gone so far as to get an option on the land in there in Corral Canyon, and had a golf designer design a golf course--which would be more acceptable to the surrounding community--with the building of this dome-shaped nuclear plant and desalting plant that went with it. We made application for the Atomic Energy Commission to build a plant, and they held hearings in Santa Monica. As you might expect, all the residents, including movie celebrities, appeared at the hearing

screaming and hollering that they didn't want a nuclear plant in their backyard. I spent several hours testifying before the Atomic Energy Commission--as did Bill Warne--as to the feasibility, safety, and desirability of such a plan. But it all came to naught because of the influence of certain individuals, principally Bob Hope.

BASIAGO: Were there other celebrities who led the fight against it?

NELSON: Yeah, Bob Hope was one. Bob Hope, I think, is one of the largest landowners in California. Anyway, that's beside the point (I live on Bob Hope Drive). [laughter]

Anyway, the department has been aggressive, and still is aggressive, as you noted previously, about the plants that they have joined with in adjoining states in the development of electric energy. We've always been aggressive in this new method of producing heat to produce steam to generate electric energy, but that's just a short episode. Bill Warne is still very active as a consultant, I believe, in the Sacramento area. He was at one time in the Department of the Interior. A very able engineer.

BASIAGO: In speaking of Bolsa Island nuclear power and desalting plant, why was it sited on a man-made island? Was that to save real estate cost, or was that a safety measure because it was a nuclear plant?

NELSON: It was a safety measure. I'm not certain as to

who-- It was down by the Seal Beach power plant, and there was property purchased adjacent to and away from the ocean that would be used for transmission lines and water transportation lines. I believe that the ownership of that land is still with the department, which hopes someday the concept might be regenerated and actually considered.

BASIAGO: You mentioned that celebrities did away with the Corral Canyon plant. Why didn't the Bolsa Island plant catch fire?

NELSON: Well, I don't think it had the political prestige, shall we say, prestigious people adjacent to it. The Bolsa Island plan was, I think, well conceived. But it still involved the construction of a heat-generating source from atomic energy, nuclear power. That was during a period when that was a no-no as far as a source of energy for anything, and it hasn't improved much. As you well know, France, I believe, in a matter of ten years from now or less is going to be powered with 75 percent or more of their power from nuclear plants. The same thing is happening in Japan. The same thing is happening in Germany, and the Western world is missing an opportunity to get into an area of producing energy from a nonpolluting source. There has never been a known fatality of any kind from the generation of electricity of nuclear power. They can't explode like a nuclear bomb, like a lot of people

think. They can if not properly safeguarded. They can put pollutants in the air, but that can be taken care of.

BASIAGO: How far offshore was this to be?

NELSON: Oh, I don't recall. It wasn't very far. See, the slope of the coast of California, or North America, on the Pacific Ocean goes off quite rapidly. The Atlantic, it's very gradual. So it couldn't be too far offshore because they would get into depths that would be uneconomical.

BASIAGO: Another innovation that actually did occur was the Castaic Reservoir hydroelectric power development strategy. Who was the innovator there, with the idea of pumping the water up to the reservoir and then drawing hydroelectric power from it during peak load times?

NELSON: The department saw, with the assistance of the [California] Department of Water Resources, that the normal size of the tunnel from [Lake] Pyramid, I think it is, was increased substantially. So that the total requirements, or the twenty-four hour water requirements, downstream of the state department of water resources customer--which was MWD--could be put through and into Castaic Reservoir in a much shorter period of time. A power plant could be built down there to take that full flow, which is, we'll say, a twenty-four hour flow, in eight hours. Three times the flow that it would be then necessary to build the tunnel, if you're going to run it continuously. So the department

participated in a study of the difference between the smaller tunnel and the larger tunnel. It developed that they could build a power plant to run during the peak hours of power demand in the city's electric system. Then that would permit them to run the plants that they do have in the basin system such as Harbor, Scattergood, Haines, and the other generating plants they have here. They could run constantly twenty-four hours a day, around the clock, and peak with this flow in the California Aqueduct. Then during off-peak hours they would be able to pump back that amount of water back up into Lake Pyramid and it would be used the next day, thereby increasing the reliability of providing energy during the peak-demand hours. So we wouldn't have to build additional power plants someplace in order to take care of that peak load. From six to eight in the evening, or four thirty to eight, is when the demand on the system is practically doubled, you might say. So heretofore at Castaic they had to shut down some of these plants--or throttle them down, you see--so that when the peak came on, all the plants would be operating at peak capacity. So this prevented them from having to build another power plant someplace else.

BASIAGO: So the steam power plants provide the energy to do the pumping back up?

NELSON: That's right, because they run continuously at the

same load all the time, and that load is something above what the low in the power curve is. When the peak comes on, they start the hydro plants and let down the water that would normally come over a twenty-four hour period down in four, five, or six hours, whatever they've worked out to provide. It permits them to operate the other plants much more efficiently, as you could imagine, because they run continuously at the same load. So that was a real blessing. That was a beautiful opportunity.

BASIAGO: Who was the creative mind behind that? Who were some of the principal innovators?

NELSON: Well, there were a number; I guess [William] Peterson and Floyd Goss and Ted Blakeslee in the power system were very active in thinking out these unusual things. This was a very unusual thing now. It required an investment, not only in the hydro plant at Castaic, but also the investment in the larger size tunnel and also a larger size surge chamber. Opportunities like that don't present themselves too frequently.

BASIAGO: Let's return to the subject of nuclear power plants. The question of earthquake safety, and the remote possibility of ground displacement following an earthquake, was one of the central bones of contention regarding Corral Canyon. Do you think that kind of set a precedent for later power plants, such as Diablo Canyon, where the issue

of seismic activity became so important?

NELSON: Well, undoubtedly it did have some influence. Anyone that is familiar with the geology of California knows that California is just riddled with earthquake faults. No matter where you decide to build something, a geologist can probably find that there is an earthquake [fault] that has been inactive for a thousand years adjacent to, or near, the site that you plan to use. That's just a known fact. The earthquake potential for this area here is substantial. We're not too far removed from where a major movement--and the major fault we're familiar with is the San Andreas--wouldn't cause considerable damage. However, most of the recent construction in downtown Los Angeles is designed so that there will be a minimum of damage in the case of a major earthquake. There will be considerable movement, I mean swaying; as far as the collapsing of structures, nothing like what happened in Mexico City.

The emphasis that has been put on the potential earthquake damage to nuclear power plants, I think, has been exaggerated. The plants themselves, the San Onofre plants, as well as the plants of PG&E [Pacific Gas and Electric Company], are designed to withstand this sort of earth movement. The containment vessel, which would release any nuclear material, is also very carefully

designed to prevent any nuclear emissions. But there's always that one chance. Even the space shuttle Challenger that went up in the sky. It's just one of those things, but it's not really as serious as when an airplane goes down loaded with people over the Grand Canyon. We are sorry about it but we take every precaution we can to prevent these things. You can't have progress without some risks. Even if you've taken all the known preventive measures it still can happen--it does happen. We live in a world of uncertainties, and maybe that's a good thing.

BASIAGO: Earlier you mentioned the great potential for regional sharing of water resources between major basins. What kind of potential for that do you see in the area of power generation?

NELSON: Well, these plants that are now being built are at locations where an energy source such as coal, principally coal, is available to fire these plants. As far as a nuclear plant is concerned, they can be built anywhere, and preferably near the point of use so you get away from transmission problems. Hydro, of course, you develop it where it's available. Coal-fired plants and oil-fired plants, you build them where the oil or coal is readily available. That's why you build in Utah. A nuclear plant: the principal resource that--in addition to the uranium--is needed is a source of cooling water. That's

why these nuclear plants are built adjacent to the oceans. There are long lines that go out into the ocean, and they raise the temperature maybe four or five degrees in the surrounding areas by providing cooler water for the reactor. As far as competition between areas for the location, it's where the greatest need is for energy. That is why the department is going elsewhere out of the basin. They are restricted in the use of certain types of fuel to fire their steam generating plants, because of the pollutants in the air that they create. It's just a matter of probably less than a decade when there won't be any-- except on a standby basis--any electric-generating plants in the basin.

BASIAGO: You were a member of the international conference on larger electric systems. In point of fact a member of the U.S. national committee. That was a UN [United Nations] venture. Am I correct?

NELSON: Yes, that was in Luzern, Switzerland.

BASIAGO: Did any thought come out of there in the area of multinational grid service? Anything like that? Cooperation of power service?

NELSON: Of course, there is a massive grid, as you know, with the interchange of energy. In fact, I was one of the founders of Western Energy Supply and Transmission [WEST] Associates. It's an organization which combined all of the

western electric-generating systems, both public and private, in order to work out a system of interchange between all of the electric systems in the West. In fact I was, I think, the first chairman of that group. The privately-owned utilities didn't want to take the lead. We had to get a lot of cooperation from the federal government. At that time, the federal government, the [United States] Department of the Interior, was very seriously considering building a grid of their own connecting all electric systems in the United States, particularly in the West. They then would operate it and control it. Well, that was very distasteful to the privately-owned, investor-owned utilities, and it wasn't too palatable for some of the municipal-owned, like the Department of Water and Power either.

So we countered it with an organization, called WEST, which was principally transmission to coordinate the voltages and the capacities of the various transmission lines we had, because there were transmission lines in various systems that had different voltages and different clearances and a lot of little detailed things. So, thus it would be uniform. I think we've had some disruptions in Northern California, or in Canada, that have actually brought into operation this system--where one system will drop its load in order to prevent another system from

losing its load. That's very carefully worked out now. There might be blackouts for short periods of time--usually in the area of one hour or less--but that's just to preserve the integrity of the entire system. That at least delayed any federal interference with the operation of the utilities, which generally worked out to be a cumbersome thing.

The operation of the Hoover [Dam] power plants, from the very beginning, has been the responsibility of the Department of Water and Power. They maintained not only operators, but electric mechanics at the Hoover power plants in order to do that job. When the contract for power expired--it was a fifty-year contract from 1937 to 1987 I believe it was, or maybe it was '36 to '86--they worked out another contract for another, I think, twenty-five years, on the sale of the energy from the Hoover power plants. In addition, when the new contract becomes operative, the responsibility of operating and maintaining the plants at Hoover will be in the federal Department of the Interior, the [Federal Bureau] of Reclamation. So all those department operators are scrambling right at the moment. I think they've got about eighteen months or less to-- I would be hopeful that--we have a lot of seniority and pension rights and that sort of thing--that they would be able to work out an arrangement with the individual

employee in each case, whereby he would continue to operate something he's been operating for a substantial period of time and work for the federal government. That remains to be seen, but I was over there a couple of months ago and there was a little bit of unrest among the employees as to just what's going to happen. It's a federal project and there's no reason why they shouldn't operate it. But they shouldn't lose the training and the expertise of the people that have been there all these years. I don't think they will; I think it will be a smooth transition.

TAPE NUMBER: III, SIDE TWO

FEBRUARY 7, 1986

BASIAGO: In 1962, the DWP led a major construction project in the Republic of the Philippines. Why were its services needed, and what was it like for the principal water authorities of the most advanced nation to direct a water development project in a Third World nation?

NELSON: Well, the World Bank is engaged in providing funding and expertise to these developing and underprivileged nations, in order to raise the standard of living and improve their economies. The Philippines were occupied by the Japanese, as you know, during the Second World War, for a period of months. They, at that time, had, in an effort to subdue the people--I presume they assumed they eventually would control the Philippines and that they would be successful in the war effort--they did almost irreparable damage to their water system.

BASIAGO: In what ways?

NELSON: Well, just destroying something as simple as house connections and making them inoperative. The Philippine people who were operating the system were reluctant and resisted any effort to rehabilitate anything, because they didn't know whether General [Douglas] MacArthur would return or not. When the Japs finally left the Philippines, the local water people made an effort to restore what they

could and put their system back in an operative condition, but they didn't have the funding. They didn't have the expertise--a lot of their people had been killed. So the World Bank stepped in. I don't know how they made the selection but they selected Metcalfe and Eddy, which was a worldwide-known consulting engineering firm with headquarters in Boston, to evaluate what was necessary to be done and estimate approximately the cost of doing the job.

Well, I had met Bill [William] Eddy. In fact, I went to Cornell [University] and we used his textbook. Bill Eddy was the son of the founder of the firm, Metcalfe and Eddy. Bill prevailed upon me to provide personnel to go over there and see what we could do. We were to make a report that could be given to the World Bank, and then they would evaluate it and provide funding to hire someone, presumably Metcalfe and Eddy, or someone else (a consulting firm) to then contract the construction to do what is necessary, and they would fund it. Well, this hit me as a splendid opportunity not only to help a friendly nation, but also get some experience. I selected Frank Twohy, who was a controller, since deceased, chief financial officer of the Department of Water and Power; Gerry [Gerald W.] Jones for the water distribution end of it; and Leathardt, what's his first name? Leathardt from the

accounting department to give us a little rundown on the billing procedures and the accounting end of their system. Now this was just for Manila and the suburbs.

We made, I believe, three trips over there, Gerry and all three of us. The first trip was, more or less, to familiarize ourselves with the personnel that they had in the water department in Manila and the suburbs, and get a general idea of the overall picture and talk to some of the political dignitaries. This was necessary in order to get doors open in certain places. Then we came back and then had several joint meetings with ourselves, and went back again and did a little more intensive work, and went back a third time to check on certain matters that we questioned, and then prepared the report. That took, I guess, about two or three months and during that period of time we were on a leave of absence from the department. It was certainly an experience. As Gerry I guess told you, you can have no idea-- They were living like people that didn't have any knowledge of any mechanics at all. They couldn't have taken a nut and screwed it on a bolt, I don't think. In the first place, we couldn't do the job, the four of us. We had to find people. We found some young Filipinos that had some degree of education. We tried to get them oriented into what we were trying to do, so that they could be the watchdogs when the thing happened.

BASIAGO: What were some of the obstacles presented by the natural makeup of the Philippines, versus, let's say, the Owens Valley model? In Southern California you're delivering snowmelt or river water across vast distances to a coastal plain. How did the methods differ on an island, a chain of islands?

NELSON: Well, they had wells, they had catchment basins, and all that sort of thing--and pumping plants--which had to be rehabilitated. That was one area, the physical area. But the political area was one that you saw no way of-- In other words, I felt strongly that any money given to the Philippines had to be very closely administered by someone, to be sure that the money was spent for pipes and meters and connections and not in somebody's pocket someplace. We had as many meetings with the-- They have strange names. They run into four or five syllables, and these people all with their long white shirts, you know. But they were: "What's in it for me?" No question about it. In fact, I'm sure if you were so inclined as a team to pick up a few bucks here and there, there wouldn't have been any problem at all.

BASIAGO: So on the first--

NELSON: That's the one phase. The phase of the work that had to be done--I'm sure Gerry told you--it's just almost impossible as to know where to start. The big job was to

get people, local people, who had enough integrity and enough know-how to actually supervise the work. They eventually got the loan and they eventually went ahead, and we had nothing more to do with that. That was it.

BASIAGO: So the first political problem was kind of a corrupt--

NELSON: Yes, it seemed to be the nature of the people. I mean, you had difficulty finding someone that you could sit down and talk to and speak the same language about doing something to restore the proper services as it should be done.

BASIAGO: Was this the kind of problem that is often identified in Japan, in terms of the way people will behave in a homogeneous society that's living very densely? You can seldom find who the leader is and someone who will accept the buck?

NELSON: Yeah, that's right, that was the feeling. Of course, we weren't there long enough; we were only there a week at a time on three different occasions. We were given top-drawer treatment by the political people, because that was, they thought, to their advantage.

BASIAGO: Were there a lot of regional rivalries that you had to cope with as well? I know the Philippines--

NELSON: No, because our job was just for Manila and the suburbs. That's where the concentration of the people was,

and that was the first job. The World Bank went ahead with it. I never checked with Bill Eddy to see how it came out.

Another interesting out-of-the-department experience I had was when I picked up the phone one day, when I was general manager, and on the other end of the phone was the mayor of New York, John Lindsay. He had apparently been referred to me as being someone who could possibly help New York City out of their water problem. Well, I knew something about--as you would expect me to--the water problem. They have two water departments; they have the aqueduct and they have the local distribution. At that time the water was billed to the customer on a front-footage basis. If it was a sixty-story building, he would get the same bill as a guy that would have a two-story house. That was one of the main problems with New York City in providing water service. They had plenty of water from the Catskills, but they weren't getting properly paid for it.

BASIAGO: So you're saying they measured the use according to how many feet were measured across the street?

NELSON: Yeah, which was ridiculous. If everybody had the same size improvement on his lot, that might be one thing. Anyway, I thought about it, I talked to my wife, Judith, about it, and I said, "Well let's go back and take a look at what his problem is and what he wants." He gave

me all sorts of promises. If I came back there in a couple of years he would find me a place to live, and this and that and the other thing, you know. I asked the [Los Angeles City] Board [of Water and Power Commissioners] for a leave of absence, which they granted to me, and I went back. I was met at the airport with a black limousine, taken to the Waldorf, and set up with a suite of rooms. The next morning at ten o'clock I went down to meet John Lindsay, the mayor. A limousine picked me up and took me down, and I went in just by myself, didn't take anybody with me. John was back there and finally ushered me through after I'd gone through about three different groups of people who looked me over. I went in and sat down with just John across the table in shirt-sleeves. He told me that he wanted somebody to put these two organizations together. He thought it was ridiculous that there should be an aqueduct division and a local water system. "I understand that you folks out there have the Owens River Aqueduct [first Los Angeles Aqueduct], and the local system, and all of them under the same staff and the same group. Why can't we do the same thing here?" I said, "I don't know. I'd have to look around and see what-- I'd have to meet some of your people." So they set up a meeting the next day, and I met with some of their division heads and talked in general about what their problems were

and what the climate was and the whole thing. I went back and told the mayor that--this is when [Samuel W.] Yorty was mayor--that I'll come back and talk to my board and see. I might be able to work something out.

So I came back, and on the plane back Judith and I talked about it and I said, "Listen, are you even considering something like that?" She said, "What do you mean?" I said, "Unless I go back there and take a staff of probably at least twelve people who I know have capabilities in certain areas and I know also that they would be trying to do a job, I'm just walking into a lion's den. They'd give me an apartment, they'd give me a house, they'd give me a car, anything. But they will cut me down so quick from the back that I won't even know what hit me. I'm not familiar with those kind of politics." So I came back to the board and told them what the situation was, and some of them thought I ought to take it and give them the benefit of our experience and all that jazz. I finally said, "No, I don't think so. His best bet is to pick somebody internally that knows the system, knows the people, and turn him loose. If he gives him a free rein, and he's an honest and sincere person, then they can go some place, but not me."

He appointed one of his borough chiefs to the job about two months later after I turned it down. Six months

from that time, that borough chief was indicted and sent to jail for mishandling of funds, or something or another. He called me because the city of Los Angeles had an experience with an aqueduct and an experience with a large distribution system. I think he was honest in seeking reliable help but he was-- Well, that's just a little sidelight.

BASIAGO: L.A. has never been burdened with the power shortages that the eastern cities have been. Would you trace those to political or physical causes?

NELSON: You mean the troubles that the East has had?

BASIAGO: Yeah.

NELSON: Or the lack of trouble?

BASIAGO: Well, we've had a lack of trouble, probably due to the Owens Valley Aqueduct.

NELSON: You're talking about water?

BASIAGO: We could address both. The East Coast--

NELSON: Has had power troubles, as you know.

BASIAGO: Yeah, a lot of blackouts. Have the blackouts and the lack of adequate resources caused the corruption, or did the corruption cripple the physical capabilities of New York City?

NELSON: Well, the big blackout they had which originated in Canada, and found its way down, showed the lack of sufficient interconnections and lack of information

available to the various power source operators as to which lines to shut down in order to prevent overloading and causing malfunctions of other lines. This, I believe, in the interim has since been corrected. I don't think there's any political influence or overtones in any of the utility operations. There may be some unusual occurrences in the gas industry, which is another energy source, but I don't believe the electric or the water are politically influenced. It's just by some oversight, a malfunction of some kind that can be corrected and usually is.

Now, we entered into an agreement to build an extra high-voltage DC line from the Pacific Northwest to this area. [Southern California] Edison [Company] is participating in the cost of the construction. The reason that the city built it is because of their bonding capability, issuing tax-exempt bonds which are more palatable to the bond buyer. For the utility purposes, you might say, basically that's the reason that we were selected to engineer and build--and the result of this is the Sylmar station which you're familiar with, up there by Van Norman Lake. The process of the engineering and the working out of the details on the construction of a line coming all the way from Bonneville and down involves DC line--which, as you know, uses direct current. Because direct current doesn't have the line losses that

alternating current has, which are substantial in a high-voltage line. Then they bring the 500 KV DC line down and convert it at Sylmar from DC to AC. And that's one of the big casualties we had at the earthquake, the destruction of that line. In the process of preparing and getting a contractor, there were a number of firms, particularly one Canadian construction firm, International Utilities, that wined and dined the board and me and Edison people, thinking they would have some influence. The question was whether we would build it with our own forces, as we built with our own forces the transmission line from Hoover. This is maybe three or four hundred miles further, but essentially the same type of expertise or construction people needed. This one firm, International Utilities, was so anxious to get the contract to build it that they did everything they could to influence the board to select them, to the point where I asked the board to approve the hiring of a consulting engineer--electrical engineer--who had expertise in DC lines from England. He was probably one of the few people in the world that could really advise us properly on this, and we hired him and we delayed the decision on whether to build it with our own forces, or contract the building, for a couple of weeks until we got the report in.

Now, this was before Yorty's administration. The

board we had was composed of Chris Moller, vice president of Hughes Tool [Company]; Bill [William B.] Henley, president of [College of Osteopathic] Physicians [and Surgeons]; Jack Thompson, a well-known contractor; Bill [William] Simpson of Simpson and Company, a well-known contractor who has built a lot of buildings down in Los Angeles; and Lloyd Wood, an attorney and past president of the American Bar Association. That's the quality of board members I had to work with, so when you said a million dollars they didn't say [stuttering] m-m-m-illion. They could listen to proper presentation.

Six months later, Yorty was elected mayor, and he fired all five. He appointed Frank Palmieri, funeral director on Washington Avenue; Nate Friedman, an attorney from Northridge; Henry Bodkin, an attorney with offices on Wilshire Boulevard, a very able man who graduated from Loyola Law School; and Cliff [Clifford] Marker, who was a good businessman. He was vice president of Thrifty Drug Stores. Then there was a fifth one. So this was the board that was to consider whether we would build this transmission line ourselves or whether we would let this international group build it. I received the report from this English consultant's firm on a Friday. I told Nate Friedman, who was then president of the board, that I'd received it, and he says, "Well, let's have a special

meeting on Saturday of the board." Which they did. I presented the report and I told the board, "I've just received it. I told your president I have it. You've called a special meeting, and my recommendation to the board is that you delay any action on this matter for at least one week, and give our staff an opportunity to review this report and come forth with a written recommendation." Nate Friedman said, "We'll have none of it. We're going to act on it now. What does the report say?"

The bottom line of the report was that you can go either way. As far as the financial effect of the department, it'll be minimal. You probably can maintain better control if you build it yourself. You've built a high-voltage transmission line with competent personnel, and it's been successful so far. Nate Friedman says, "Do I hear a motion from the board that we award a contract to International Utilities, that we enter a contract with them to build this line?" One of the other board members said, "Aye," and called for a vote, and they voted to give the contract to International Utilities. I, of course, was sitting there. Friedman took the contractual document into his office and signed it. Of course, Tillman, our chief counsel, was there. I turned to Tillman and I said, "What the hell's going on in here?" He says, "I don't know." That Sunday I got a call from the mayor's office, Sam

Yorty. He says, "I want you in my office at nine o'clock Monday morning, with all five board members." Yorty ripped them up one side and down the other, to the point where two of the board members were on their knees crying, practically crying. They had been appointed by the mayor, and they figured the mayor now would probably ask for their resignation and appoint someone else.

BASIAGO: Were they literally crying?

NELSON: Yes, sobbing. I didn't see any tears. "I want you to go back this afternoon, have another board meeting, and rescind that contract." Tillman and I sat on pins and needles for, what's the statute of limitations, six years, seven years? We went ahead and built it ourselves, but International Utilities never asked that that contract be honored--which they could have done and sued for lost profit and what have you. That is an example of-- You see, the board met twice a week, Tuesdays and Thursdays, ten o'clock. So that meant that the general manager who was making all the presentations was either cleaning up after the board meeting as to what instructions had been given, or preparing for the next one. Now the board meets, I think, once every two weeks, or once a month, which is the way it should be. They have a good solid board. I'm not saying anything derogatory about the members of the board at that time, but it was just a little bit more than they

could handle in managing an organization the size the department was. All of the men, I believe, are deceased now that were on that board, with the exception of Clifford Marker, and maybe Frank Palmieri. That was an example of some of the tensions you might say that you have to learn to live with. Well, that was just a little digression. We can delete portions of that, as you see fit.

BASIAGO: What was the specific thing you worried about with the statute of limitations? That was on the contract or the--

NELSON: Certainly. This firm had in good faith made a proposal, a signed proposal.

BASIAGO: And it had been accepted.

NELSON: And it was accepted by the president of the board, and by a vote of the board, because he was there.

BASIAGO: So they gave the mayor and the board and the department a heck of a lot of leniency in allowing them to back out of the contract.

NELSON: I don't know what was going through their minds. They might have had something else in the fire. They certainly had every right to step in there and say, "We have a contract--"

BASIAGO: "You either let us do the job and pay us, or pay us anyway."

NELSON: Yeah, sure. But they never did. So much for the hairy side.

TAPE NUMBER: IV, SIDE ONE

FEBRUARY 7, 1986

BASIAGO: That was an example of one corporation [International Utilities] that showed some remarkably unmercenary behavior. Are there any major corporations that are consistent partners of the department [Los Angeles City Department of Water and Power] for major construction or anything?

NELSON: No.

BASIAGO: How is competitiveness preserved?

NELSON: There may be a little bit of sharpening of their bid on some of the large, we'll say, pipeline orders, particularly on trunklines of large diameter. I'm talking about four feet in diameter up, where the question is whether it should be welded steel or reinforced concrete. Sometimes they get quite competitive, depending upon lots of things. Generally depending on how full their production line capacity is. Do they need work or not? American Concrete Pipe, Ameron [Inc.], has manufactured a lot of pipe for the department. When I was with the water system, the use of the power plant at San Francisquito [or Saint Francis] power plant (both 1 and 2)-- It became quite apparent that if there was another reservoir available someplace, they could operate those two power plants as they now are operating the Castaic power plant on just

peaking. So if there was another reservoir, it would be beneficial to the power system to use that reservoir for peak periods, and then let the coal-fired plants or oil-fired plants operate on a firm basis. So the water system also felt there was a strong need for another good-sized reservoir, 30,000 acre-feet or something, that would take care of the water needs that the aqueduct would normally supply over a period of three or four days.

That's when Bouquet Reservoir was filed as a proper location. They built Bouquet Reservoir because it was on the south side of the San Andreas Fault. The Elizabeth Lake Tunnel runs from Fairmont Reservoir down through this long tunnel into the power plants and then down the canyon. Formerly, in the twenties, they had built the Saint Francis Dam for the same purpose--so they could discharge into that reservoir during peak flows. But that was no longer available, of course (this was in the thirties). So they went ahead and built the earth-filled dam at Bouquet Reservoir. There are actually two dams there. And they built a pipeline. The pipeline, I think, is about sixty inches, or five feet, in diameter--steel pipeline--from the southern portal of Elizabeth Lake Tunnel on over to Bouquet Reservoir, a distance of about three and a half miles. During the early operation of the reservoir after it had been filled, all of the air valves at the

lower portions of the pipeline were faulty. That meant that that created a vacuum in the pipeline. The pipe actually collapsed to the point where in some places the top of the pipe was within three or four inches of the coal-tar enamel bottom. It was a sight to see. This was coal-tar enamel pipe.

The Antelope Valley pipeline collapsed in the same way during the early stages of the operation of the Owens River Aqueduct [first Los Angeles Aqueduct]. The "Old Chief" [William Mulholland] said, "Water did it and water will undo it." So they turned on the water and the damned thing blew up just like a balloon. There were some leaks in it but not very many. So we did the same thing with the Bouquet pipelines. All that can happen is that something will happen and we'll have to cut it out and repair it. It certainly is no good the way it is. So they blew it back up and I'll be damned if that thing didn't come back to a full round. We went in with electric testers to see if there were any leaks in this coal-tar enamel, and there were a few that were patched, but not very many. And, of course, we fixed the air valves. But that was just an unusual situation.

These contractual arrangements on large out-of-state power plants--while they were in the concept stage when I was still general manager in '67--have come to fruition

since I left. The success they're having in maintaining good relations with the out-of-state people, even in their official capacities at the state level in those states-- It's remarkable how these nuclear plants and coal-fired plants are being received. There's no question that it's a boost in the economy. I'm sure that arrangements have been made so that a substantial portion of whatever is needed of the energy itself will be kept statewide in there, which will relieve them of the responsibility of building a plant to provide for their growth in Salt Lake City, or any large urban area that is growing. They've done a remarkable public relations job and it's been done very quietly. I haven't read very much in the press. The press can make, I think, quite a story about their raping of the resources of Utah or Nevada, but they've skipped that for some reason.

BASIAGO: In addition to the American Concrete Pipe Company, are there any frequent corporate partners of the department?

NELSON: Well, they're not really corporate partners but--

BASIAGO: I mean corporations--

NELSON: --doing substantial business with the department. Of course, U.S. Steel [United States Steel Corporation], Western Pipe and Supply Company, and, of course, these Hersey Meter [Hersey Products, Inc., Water Meter and Controls Division], Badger Meter [Inc.], they sell lots

and lots of meters. The electric meter either functions or it doesn't function. The water meter is accurate when it's put in, if it's properly calibrated. But the minute it's put in, it slows down, because of weather and the impeller and one thing or another.

BASIAGO: So people get a free lunch?

NELSON: Well, on your maintenance program, you see, you replace meters. You go once in a while and take one out and replace it and test it, because whatever is happening to that meter probably happened to the rest of them. So that is an ongoing program, of course, which is just one of the minor things in the water industry.

BASIAGO: Are there any foreign firms that are now supplying steel or instruments?

NELSON: Oh yes. Mitsubishi [Corporation], and also the electrical equipment.

BASIAGO: Is that coming out of Japan or Germany--the instruments?

NELSON: No, Japan.

BASIAGO: Japan?

NELSON: Japan. A few out of Germany, but mostly Japan. We're furnishing them the old beat-up cars to melt down into steel, and they're selling it back to us. Which is all right, except that if we're not careful we could become a consumer nation. A bunch of gas stations, grocery

stores, and department stores.

BASIAGO: Banks and hamburger stands.

NELSON: That's right. You don't know. The labor situation is something that is difficult to understand. I'm sympathetic to labor. I'm an honorary member of the Local 18, [International Brotherhood of] Electrical Workers union, and I'm sympathetic to their-- I think a man's entitled to just pay for just work. But when you can go over to Korea and produce a production line on some really delicate instrument by cutting it up into pieces, and get labor at unheard of wages where the standard of living doesn't even come close to what our workers have to have-- You then think about quotas, embargo, and that sort of thing. And that isn't good.

BASIAGO: What do you think the answer is? Some new realism in the U.S.? Bring wages down or what?

NELSON: No, of course this should be kept under control. I think the thought of having labor be part of management, even to own stock and get paid dividends--

BASIAGO: So you think ESOPs [Employee Stock Options Plan] would serve as incentives.

NELSON: I think that has a lot going for it, because the average laborer doesn't want to price himself out of a job. He's usually got a family and payments on his house and his car, and kids in school. He just wants to go along

and advance in his profession, whatever it is, and he doesn't want to be on the bargaining table every six months. With China coming into the general area of labor availability, I don't know. Maybe robots will lessen the need for manual work. I don't know.

BASIAGO: Looking over the department reports and Intake, the department publication, I noticed that it seems to be very common for people to spend their whole career at the Department of Water and Power.

NELSON: Yes.

BASIAGO: Do you think that the Department of Water and Power presents a model to U.S. corporations? It seems that it shares with many of the Japanese firms a tendency to provide incentives. Is that true? Are there incentives for employees to stay with the department?

NELSON: No. As you know, I was there for over forty years. Strangely enough, it's just a matter of luck. The payroll master will tell you that I wasn't absent one day during forty years, for illness or any other purpose. From the day I went to work, when I got up in the morning I couldn't wait to get to work to finish the job that I was doing, or get involved in a new one. I don't know what does that, whether it's the type of people you're working with, whether it's the surroundings, the location, or the-- I have a feeling that as much of it is due to your

compatibility after work. If the kids are getting fair grades in school, if grandpa and grandma are okay, and that sort of thing. I think that has something to do with the quality of work that you do, and also how you conduct yourself. I taught advanced hydraulic engineering at USC [University of Southern California] night school for about five years back in the late thirties. It got to the point where I was doing more work than the kids. I had to work like hell to prepare for class, and it just got a little too much. As I said before, I think water people particularly, let them work there five years and I think you've got them. If they're in a job that they're not only able to do, but able to do it well, then they're able to make suggestions on improving the methods which they are using.

BASIAGO: So you're suggesting the quality-circle approach which the Japanese have exploited so well.

NELSON: I think actually that means more than money. I went to work for the department for \$95 a month. That was a lot of dough in 1928. Of course, along came the Depression. Kids I went to school with would drop in, "Anything I can do around here?" People with good backgrounds were out looking for a job. [tape recorder off]

BASIAGO: I want to get back somewhat to the war years. I

talked to Gerry [Gerald W.] Jones somewhat about this. You were the head of the plant protection division. What were you specifically worried about? Someone blowing up the aqueduct or poisoning it?

NELSON: Well, when December 7 happened, we evaluated all of our key locations and we found-- You hear talk about sending the people to Manzanar being such a terrible thing. They don't say very much about the terrible thing that the Japs did in blowing up our battleships in Honolulu.

On December 8 we evaluated our various key locations. We found a very modest hotel next to our Hill Street building, and on the seventh floor of that building--which is opposite the fifth floor--was the center of our communications. We had I don't know how many trunks into the telephone room. They had contact with all of our district offices, yards, and various power and electric facilities throughout the entire system through this communication center. Strangely enough, just across a short, small alley in this hotel there was a Japanese family. We didn't look in to see what they were engaged in, but they were at a crucial location to destroy our communication center--if it was necessary to do that. Below Van Norman Lake we had leased an area of good farming land to a Japanese gardener to raise strawberries. At one

of our main terminals of the Boulder transmission lines-- Receiving Station B on Century [Boulevard] and Avalon [Boulevard], in the southern part of the city--there was a Japanese farmer raising crops in a critical position to disrupt, if he had proper facilities, to disrupt the energy flow from Hoover Dam.

The same was true throughout critical locations on the Owens River Aqueduct [first Los Angeles Aqueduct], and it became quite apparent to our security committee, which was chaired at that time by Robertson, engineer in charge of construction for the power system. The members were Burton S. Grant and Bill [William] Foster. Grant was at one time chief engineer of the water system, and Bill Foster was the purchasing agent. The committee had been formed months before, realizing that growing tensions might require some action by the department to protect its own facilities. We had been told that, while Southern California was the staging area for troops that were transported over to the South Pacific, there was no part of this contingent of soldiers that would be assigned to protect the utilities who were providing energy and water supply to the aircraft industry, which is quite extensive in the Southern California-Los Angeles area, and that we'd have to protect our own facilities.

At that point in time I was engineer in charge of

construction for the water system, and there was little need for the continuance of that activity faced with the all-out war effort. So the personnel that had been in the major construction division for the water system were assigned the responsibility of providing protection for both water and power facilities throughout the system. My assistant, Jack Cowan, and I--along with a man whose name escapes me, from the power system--evaluated all the key points where damage could occur in both the electric and the power system. We proposed to provide around the clock protection, with an armed guard at these various locations. Having known that this was the department's responsibility, and that neither the police department of the city nor the armed forces would help us, we had to provide training facilities for people that we would hire to man these various posts. We put men around the clock at various receiving stations throughout the city, they being the critical points in the power system. We put men around the clock at our key reservoirs and outlet works, where destruction would cause interruption in water supplies. We were particularly attentive to any service that provided industries that were helpful to the war effort at that time. At one time we had over three hundred guards on the payroll, extending all the way from Hoover Dam to Los Angeles, and from Owens Valley to Los Angeles.

We set up a training program for the handling of hand weapons--these were revolvers--at Substation 11 on West First Street, Boylston [Street] and First, in the basement. We hired men who were former military people expert in the use of handling firearms. We equipped each station--not the guard himself--and he would pass the weapon on to the guard that he relieved. That went on for a number of months. We were, of course, very apprehensive about giving civilians firearms that were equipped, but they were told to use them only in extreme emergencies.

We patrolled the aqueduct as well, nighttime and daytime, and patrolled the Boulder [Dam (Hoover Dam)] transmission line and the two switching stations at Victorville and Silver Lake. It was an effort which we felt was quite necessary. The military at that time had told us, in confidence, that they fully expected the bombardment of Honolulu, and that the next move would be an invasion of the West Coast.

BASIAGO: This was prior to Pearl Harbor?

NELSON: This is after Pearl Harbor.

BASIAGO: But they admitted that they knew it was coming?

NELSON: They felt that the Japanese-- We had no navy. They felt that Japanese would take advantage of that and bombard it, and take a portion of our West Coast. Their line of defense, as far as the United States was concerned,

was the Rocky Mountains. This was the advice we had received from the military. Now, what would you do with the Japanese population in Southern California when you weren't sure that there wouldn't be some secret way of advising the Japanese population to destroy certain locations that they were locally familiar with? The most vulnerable location was above Van Norman Lakes, the Newhall Pass. All the communication lines, telephone, telegraph communication, ran through that pass. Not only did the Owens River Aqueduct come through there, but the transmission lines from the aqueduct power plants came through the pass there, and also [Southern California] Edison [Company]'s power line that came from Big Creek in their power plants up in the San Joaquin Valley. And the major highway and the major railroad north was through that pass.

To make it easier for anyone who was bent upon doing some harm to the utilities, the Hercules Powder Company had six brick houses up Magazine Canyon, right up above upper Van Norman Lake, loaded with explosives of all types and with the caps and things necessary for detonation. They had a guard, an elderly man, who sat outside of an improvised guard shack with a dog at the entrance to Magazine Canyon. If anyone was really bent on disturbing the utilities, all of them, even the gas lines, they could carefully place explosives at key points and throw the

whole Los Angeles area in a state of turmoil. These are the things that, when you have security responsibilities, you think as possibilities. Fortunately, nothing like that ever happened. I believe a Japanese submarine did put a bomb in the oil fields up above Santa Barbara during this period of time. But there was no reason to think otherwise.

BASIAGO: Did the department consult at all with the Roosevelt administration regarding the vulnerability of its grid?

NELSON: Oh yeah, certainly.

BASIAGO: Prior to the internment order?

NELSON: Prior to Pearl Harbor?

BASIAGO: No, prior to the internment of the Japanese-Americans.

NELSON: Well, I couldn't say if somebody did that. The internment that they provided was not a Siberia. The Manzanar internment camp--there were others, but it's the one which I'm familiar with--was certainly in a desirable location. It's true they were impounded behind the fence, but they had their own schools, their own churches, their own stores, were fed well, and kept well. It's unfortunate that some of the Japanese businessmen in this area suffered substantially. But here was a situation that, looking back over the facts available at that time, I think the right

thing was done. And it was done in an orderly fashion. No one ever gave the signal, because I'm sure it wasn't happenstance that certain locations, key locations, had Japanese as tenants.

BASIAGO: That's an interesting statement. Are you saying that prior to Pearl Harbor, or right after it, the Japanese installed Japanese-Americans near important areas?

NELSON: No, they had been there for several years. They had been in these locations everywhere. They were local citizens.

BASIAGO: Yeah, they were farmers.

NELSON: They were farmers. They were local people.

BASIAGO: So it was happenstance?

NELSON: Well, you can say that, but if you look at it from another way, you can plan far enough ahead. You don't know; I don't know.

BASIAGO: You're saying looking at the-- Many Japanese perhaps, I don't know what the figures are, but many who came here over the generations were involved in farming. And, actually, following the exclusion act [California Alien Land Law, or Webb-Heney Act, enacted in 1913, reenacted in 1920] of the first part of the century, their land holdings quadrupled, despite the discrimination that they suffered under that act. I'm wondering, wasn't this just a natural evolution that they owned a lot of the most

important farmland near the water system or-- I'm just wondering if you're leaving open now the possibility--?

NELSON: Well, which could be done now. You could go back and see where other Japanese were doing similar things at locations that were not vulnerable. If this was one out of a hundred Japanese families doing this type of farming and there were ninety-nine others doing the same type of farming someplace else, then you'd say, well, that just happened to be good land there, and they decided to farm it. But if that was not the case-- Of course in the heat of what was going on, you know, everybody was just proposing everything. You see, we were totally unprotected on the West Coast.

BASIAGO: So, you're saying that certainly the opportunity for their location to be exploited existed.

NELSON: Well, I would say this: If we had evaluated it as just being happenstance, I'm sure the department would not have approved the expense of hiring some three hundred armed guards to protect certain key facilities. The incentive of doing that--hiring people to protect the key facilities--is that we found Japanese in positions already in place to do harm if they had the material to do it. You know, looking back on it--at that time I was thirty-seven, or thirty-six--the thing that upset me more than anything was that here were armed soldiers in the military being

assembled and at a staging point to be shipped over (when they could find a ship to ship them over to the South Pacific), and all they're doing is squad-right and squad-east to keep them in shape, when they could be doing this work that we're doing.

BASIAGO: No one doubts that the fears of collusion among Japanese-Americans were very real. What has always been at issue was how much collusion there was, if any, with Japan proper. Are you saying--I'm still not clear--are you saying that the department had evidence that a critical mass of Japanese citizens had been strategically located? You're saying no?

NELSON: I don't know.

BASIAGO: You don't know.

NELSON: All I know is that when we looked, if you were going to blow up and disrupt the water system, where would you go do it if you had the dynamite to go do it with? You would go there. If you were going to disrupt the energy from Hoover Dam--which would take months maybe to get replacement parts or something--where would you go? In other words, if you're going to disrupt the communication system so we can't talk to each other, where would you go and what would you do? When we took a look at what was happening where these were, it just happened that there were Japanese at these locations at least eight hours a day

working or doing something which made that available to them. Now, I don't know-- So I think, on that basis--not that I had anything to do with it, and the department didn't have anything to do with it--but I'm sure whoever President Roosevelt issued the orders to (I guess it was his authority), someone had knowledge of these things that we had knowledge of and said, "Why take a chance?" That's all hindsight, of course. At that time the committee--and I concurred with the committee--felt that we should provide some semblance of protection. So if nothing else, to tell the disturbed citizenry when something was destroyed, "Well, we did the best we could. We had an armed guard out there, but they overpowered him and went ahead and did what they had planned to do."

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BASIAGO: Is it possible that the reason there were these concentrations of Japanese laborers near the most important points in the grid was because the construction was carried out either on their land, or that they only had the opportunity to purchase land that had in some sense been used for major connection points on the water system? Or maybe bigger farmers or more settled families might have directed the projects away from their property?

NELSON: Well, I'm not clear. You say on their land. I'm not clear. I assume the land that they were on was city owned and that the land was being leased to them for that purpose. Now you're suggesting that because they are an agrarian nation-- I mean that all that was available to them after the Japanese exclusion act (if they were going to stay in California) was farming, and naturally they would seek out farmland--even if they had to lease it--that was suitable to producing a satisfactory crop. That is something I don't think anybody ever really followed up on. It would be interesting if somebody had followed up on these individuals, and where they were, and a little bit more of their history. Where were they a year ago, two years ago, and a little bit more about-- I think it would give you a better insight into the decision that was made,

which was a quick decision, and whether it was a proper one or not.

The people--I guess you weren't even born then--the people were really incensed. As you read the account of what happened, it's kind of a strange thing to say, but it wasn't quite as convincing that the Japanese didn't do what had to be done in their best interests. Now, you may know, there were very few civilian fatalities. All the concentration was on the ships, the battleships that could form a danger to them in their effort to expand their holdings in the Pacific. I mean after all, there's a small island over here, the Japanese islands, that is growing, and the military had command of the government apparently. And they built themselves to a strength where, in their opinion, they were now able, if they could keep these battleships from harassing them from the West, to expand Japan to where it should be and do something for the Japanese. I mean, if you take an attitude like that maybe, too bad, a lot of Americans were killed and a lot of people are still disturbed about it--but it's a strange thing.

Now, if you take the other viewpoint, which apparently the security committee was concerned about, this is the first move. Here's the whole western fleet of the United States destroyed. The only fleet they have now is the one on the East Coast. It will take them a month or more to

get down through the Panama Canal and get over into the Pacific. Besides, they have problems over there anyway with Germany and the shipping lanes. Now's our time to maybe keep going and take over San Francisco and San Diego, which are very close to the coast, and set up a military government or something. I don't know.

BASIAGO: It has often been said that Mexico, by virtue of its citizens who emigrate here, is different than other nations in respect to the United States because it shares a border. The Mexican-American citizen in some sense always shares a dual citizenship with Mexico in terms of communications with relatives and that sort of thing. Do you think that's also true of Japan, because of their proximity on the Pacific Rim? The Japanese-American who was interned--even the second- or third-generation Japanese--was somewhat different, let's say, than the second- or third-generation German citizen or Soviet descendant?

NELSON: Well, I don't know. One of the employees of the department, he became head of the water distribution division before he retired, Toyota Wyita. I think he was a Japanese interpreter on the battleship where the peace treaty was signed with the Japanese military, and maybe he could tell you something about it, some of those things. But the Japanese, not all of them were sent to Manzanar.

Of course, there were other concentration camps. I don't think anyone east of the Mississippi was disturbed. I'm not clear on that. I think it was mostly the western states that were disturbed about the Japanese population.

BASIAGO: I know there's a great ethnic diversity in the department now. In those years were there many Asian-Americans working for the department who were interned?

NELSON: I'm not clear on that at all.

BASIAGO: But the general feeling was that if Japan continued to push east and expand its "coprosperity sphere," that these citizens might become like an insurgent force.

NELSON: And the rationale for that, looking back on it, was, I don't think, too well-founded. In other words, time was such an important factor. These things were available and they had been there for some time, and the locations-- Looking back on it, it appears it would have been more prudent and more sensible if we'd taken the Japs that were in critical locations and sent them to someplace and subjected them to an interpreter with pretty severe interrogation, instead of taking everybody. I mean, I think that was hysteria in a way, but I was part of it. You just got to put reasoning into some things that you have done yourself, when you reflect on them.

BASIAGO: You mentioned that really no effort was made to

trace what these citizens in key locations had done over the past several years. Had they traveled to Tokyo? [laughter]

NELSON: Well, did they have a shortwave radio at home and other things that they could communicate with?

BASIAGO: I guess what I was suggesting is that under the pressure of the Asian exclusion act, they probably didn't have their choice of key land. That's what I seem to remember reading. It seems sensible that a major physical plant isn't located on key land. Also, they probably bought land later and so they probably didn't have the choice--

NELSON: No, they couldn't be selective.

BASIAGO: So that would make sense that they could be near the key construction sites.

NELSON: I would lay awake at night waiting for the phone to ring where one of the guards would have killed somebody, just unintentionally. Putting a gun in some of those people's hands was just awful, but that's what the committee wanted. I think Captain Henry Jacques was on that committee too; former military men mostly.

BASIAGO: Was he leaning heavily toward--

NELSON: Oh, sure. And Robertson was a military man. Van Norman himself was too.

BASIAGO: Under the pressure of all this hysteria--

NELSON: The mere fact that we were getting absolutely no

help from the troops that were going through the area, staying two or three weeks in the staging area to ship them over to the South Pacific--that to me was frustrating. I thought why should we-- It's a war effort and part of the military responsibility, I felt.

BASIAGO: Under the pressure of this wartime hysteria, with the board swinging heavily toward the direction of fearing collusion, were there any individuals that you can remember who stood up and said, "Wait a minute, we're starting to impinge on civil rights here?"

NELSON: No.

BASIAGO: It was unanimous then.

NELSON: Civil rights. What's that? Nineteen forty-one, what's civil rights? You don't have any rights, you just think you have them. That's all the big deal now, civil rights. If you look around you and count the rights you have, there are not very many. Well, that was an experience. [tape recorder off] I've got a picture-- We got a citation from the adjutant general, or something or another, for being a very efficient guard force, and all that jazz that goes with it. [laughter] I got a picture of our whole group, and you talk about a bunch of serious looking guys--nobody laughed. That was the mood of the times. [tape recorder off]

BASIAGO: Let's talk about civil defense and the water

system. Gerry Jones says that the only real emergency plan he drafted there involved supplying everyone with a radio, and telling them in the event of a natural or a nuclear disaster they should report to their normal place of work or the next nearest location. Has there ever been anything more extensive instituted under civil defense to preserve the water system?

NELSON: I was chairman of a civil defense group which had on this committee a representative from not only utilities, but agencies that provided any type of public service to the community. The purpose was to coordinate our joint activities in the event of--principally what we were talking about was a major earthquake. We were organized statewide and met with Governor [Earl] Warren in a meeting in Sacramento. We met with him up there to get directions from him. In the case of an emergency of real proportions, a major disaster, a major earthquake, the present law says, in effect, that the governor is commander-in-chief of all the activities on rescue, restoration, and the whole thing. We asked Governor Warren at the time, "How would you administer your responsibilities?" And he, point blank, categorically, said, "I intend, if that occurs, to have nothing to do with the rescue or the rehabilitation or the implementation of any type of activity. I expect the utilities to handle their own problems, because they are

the ones that know about their own systems. I expect them to assist each other and put it back together again." We said, "If that's what you plan to do, we will proceed immediately and implement that program." Which we did.

What Gerry Jones was referring to is that we exchanged information; we had a pool of information. We had a head of the water system for the southern part of the state. We had a head of the water system for the central part of the state. Usually we had a principal head of the utility in the area, and the same thing for the electric and the gas. Tell them what to do in the event-- Turn off the gas or don't turn off the gas at your house. We compiled (in the larger utilities) the major fittings and lengths of pipes and sizes that were available in certain areas. So that if Santa Barbara were hit, they would know that the city of Los Angeles, or maybe even the city of Ventura, might have some certain fittings or something, and then they could call upon them to do that, to provide that, on account of this security organization. John Longwell, who was head of East Bay Municipal Utilities District at that time, took care of the northern part of the state for the water system. It had side effects, artificial side effects, because it brought these utility people to thinking on an area basis, rather than on their own little utility in-- "You've got some material there, I think. You

know as much about it as I do now." What was the name of that organization? Paul Pollock was my assistant and I assigned him complete-- He was secretary of the organization and did most of the clerical work and the compiling of the material that was available.

BASIAGO: I can't find it.

NELSON: Well, I got a-- In fact, when the thing disbanded I really stepped out of it. They gave me something with everybody's signature on it. One of these framed deals. But anyway, that to an extent has continued, but not to the extent where we had plans. We wanted each agency's warehousemen to compile a current list and keep it updated on the amount and quantity and location of waterworks materials, which would be needed in the event some system was disrupted.

BASIAGO: Let's paint our worst-case scenario. Suppose tens of millions of Southern California citizens were killed in a nuclear war and the aqueducts were destroyed. Is it possible that survivors would be able to find some pure repository of water, drinking water? Is there any stockpile in the wells in the [San Fernando] Valley? What would be available? Let's say we're writing a science fiction novel.

NELSON: Wells would be destroyed too in all likelihood, if you're talking about damage to that extent. There would be

no water in hot water heaters and in the toilet tank available.

BASIAGO: That would be vaporized.

NELSON: Yeah, the tank would be destroyed if you're talking about that. Probably what would happen, they'd cordon off the area from Mojave to Barstow to San Diego, and nobody could go in and out. The people above that could come in and do what they could to pick up the pieces. As far as the availability of any water, or even food, I guess-- Of course, that, to me, would be the act of a madman. If you're going to take something over, you don't destroy it. You've got a job to clean it up yourself. You take it over by another means. I personally think we've seen the last war we're going to ever have on this earth, unless some madman gets hold of the capabilities to do major destruction, which can happen of course.

BASIAGO: One other area that I want to address is something which the department is not charged with being responsible for, but there are some civic issues that are connected with this. And that is the fact that the Hyperion [Treatment Plant] outflow was constructed and then upgraded in the 1950s to handle 100 million gallons of sewage a day. Presently 400 million gallons a day pass through the outflow, and naturally only a quarter of that receives secondary treatment. The rest just undergoes a

settling. Is there a problem in the organizational structure on Water and Power on one side and then sanitation [Los Angeles City Department of Public Works Sanitation Bureau] on the other that perhaps leads to that kind of problem? In other words, is there an organizational solution to the sewage problem in the Santa Monica Bay?

NELSON: Well, that of course is more properly a question addressed to the chief engineer's sanitation district. But the problem-- Of course, this is all inherent in waste disposal of all kinds; even now we're dumping and filling canyons with trash. We've actually run out of canyons, and what we're going to do we don't know. You can't burn it. You can burn it but the fumes from it are pollutants. From my viewpoint, I think the answer is that we're fortunate in California to have deep canyons--I don't know how deep, but I guess they're several thousand feet deep--adjacent to the shoreline. On the Atlantic Coast they take those barges from New York City and dump them out there, and sure they're almost out of sight, but they're still in water that you can almost walk in. I mean the water isn't very deep. They've got a real problem. I think that there must be some use for it to be salvaged; after all, it has got nutrients in it. No matter what it is, it has various elements in the chemical scale that could be retrieved and

possibly put to beneficial use.

I know this has been thought of, but to dump raw sewage in there-- We had a place down in Manhattan Beach and we lived there when we were first married, in the early thirties, for four or five years. Of course, we were ocean-oriented, surfing, swimming, bathing, but I can remember I gave a speech at the [Water and Power] Speakers Club. The speech was oriented on the El Segundo trout. Actually, at that time you did see El Segundo trout in the surf, because the outfall had not been extended far enough, and some of the disposable material was being washed back down on the various beaches, as was oil. You always had a can of kerosene outside your house to wipe the tar off your feet that was being washed up on shore. That was just standard. But, as far as the extending of the outfall, and only 25 percent of it being partially treated--the rest of it being practically raw sewage--I understand that it has developed a new type of endangered species by feeding off of these nutrients that it has produced. But that's a tremendous amount of sewage.

BASIAGO: I guess what I was saying is we have this water and sewage dichotomy. DWP is charged with, or is in the business of, supplying water, and after it becomes polluted a whole other division is responsible for disposing of it. Is there any chance for some kind of interagency task force?

NELSON: When does the department's responsibility cease? Maybe it ceases after the person has paid his bill and deposited-- There are other districts-- Coachella Valley Water District has the sanitation responsibility. I think the East Bay Municipal Utilities District, I'm pretty sure, has similar responsibilities. I'm not so sure, but the answer to the human excreta is at the source. I think there ought to be developed a type of disposal that would make human excreta innocuous or something, through use of chemicals. They do so many things with rays and electronics and things; it doesn't seem unreasonable that if they put their mind to it there ought to be some way at the source, so that the only things that came through your sewage system would be things from your washing machine and your shower and your dishwasher, but not the dangers maybe from the main source. The same thing with water when you get it, you should try to get the pure water and keep it pure, instead of taking in unacceptable water and spending a lot of money to make it satisfactory.

BASIAGO: Yeah. Buckminster Fuller said that the reason he tried to invent a dry toilet, which is connected to a methane digester, is because it takes forty gallons of water to flush down a pint of pee. I guess you just have basically said the same thing. The household toilet is probably the greatest waster of water supply.

NELSON: That's right. It's ridiculous, but we just haven't put our mind to that. I'm sure it could be solved, when you do so many impossible things.

BASIAGO: Does the DWP have the leverage over sanitation to really bend its arm and--

NELSON: The only place they're involved in sanitation is, of course, to see that the water that they deliver meets all standards, and in the protection of the underground supplies that they have wells in. They have to see that they don't become polluted. As far as anything to do with sanitary sewage system, that's the county sanitation district's responsibility. Not that it couldn't be changed with the proper legislation. I think they are doing a good job with the sanitation, but they have got a bear by the tail in both waste disposal as well as sewage disposal.

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