Nevada Test Site Oral History Project
University of Nevada, Las Vegas

Interview with Charles Costa

February 13, 2009
Las Vegas, Nevada

Interview Conducted By
Leisl Carr Childers

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[00:00:00] Begin Track 2, Disc 1.

Leisl Carr-Childers: *OK, I'm here with Charles Costa at the Atomic Testing Museum. Charles, when were you born and where are you from?*

Charles Costa: I was born on March 20, 1939, in Medford, Massachusetts.

That's a ways away from Nevada.

It's a ways away. And coming to Nevada was a culture shock. [Laughing]

Was it? What year did you arrive in Nevada?

I was commissioned in the U.S. Public Health Service [USPHS] in January 1962 as an ensign. The last of my choices for a duty station was to come out west. Well they sent me out to the Nevada Test Site [NTS] on January 8, 1962. At that time the U.S. Public Health Service was responsible to the Atomic Energy Commission (AEC) for the offsite safety program at the Nevada Test Site. In fact, the PHS had that responsibility since the early fifties.

And why was the West your last choice?

Because I had never been out west. [Laughing] And especially to the desert. I had graduated from the University of Massachusetts with a degree in civil engineering and I wanted to do civil engineering type of work. Radiation was the least of my desires. In fact, I don't know that I even knew how to spell the word "radioactivity" in those days. The PHS needed people out here at the test site because, if you look back at the history of testing, I came out approximately two months after the Nuclear Weapons Testing moratorium ended. The moratorium ended, what—the end of September 1961. There was a testing moratorium from 1958 to 1961. In September 1961, the Soviets [Union of Soviet Socialist Republics, USSR] broke the moratorium. They

came back like gangbusters with several nuclear weapons tests in a short amount of time, and we had a tough time even getting one off. That's when we went to an all-year-round testing program and everybody was building up their manpower and infrastructure here at the test site. So did the Public Health Service, who was again responsible for the offsite safety program. And so I showed up in early January of 1962.

And how did they recruit you?

I applied for a commission in the U.S. Public Health Service. You have to take an examination, you have to have a degree, pass a physical, and all of that. So I joined the Public Health Service to do engineering work. I also knew that it would fulfill my military obligation as well, with two years of service in the Public Health Service. And I figured, well, that's a good way to do it. But they sent me out here to Nevada. [Laughing]

[Laughing] Yeah, a far cry from Massachusetts. I don't think I've really looked into this, but why did you have to have a military obligation?

In those days the draft was in effect, and so rather than go into one of the military services and end up maybe not doing engineering work, I decided that I would join the Public Health Service. I had a job in the summer back east and my boss told me about the Public Health Service. He was a reservist in the Public Health Service, so I pursued that and it turned out OK.

What was his name?

I don't even remember his name.

That's all right. But he was the one that put you on to this as an option.

Yeah. And I heard a little bit about the Public Health Service because they came to the university, recruiting people, but I didn't pay much attention to it.

OK. And when you got to Nevada, what did you think?

I was not used to seeing large open spaces [Laughing] and its ninety-seven varieties of brown. When I was a young guy and went to the movie theater, often times I saw nuclear testing film clips or I saw them on TV. You would see some of the dramatic effects from tests at the test site. You know, gee whiz kind of things with Military and Civil Defense effects tests showing houses being blown over, and that sort of thing. And so when I came to the Nevada Test Site beginning on January 8, 1962, I said, wow, this is where they did the atmospheric testing a few years earlier. So I was really impressed as a young guy. I never had a course in health effects or radiation monitoring or anything like that.

Did they teach those courses?

Yes they did. The Public Health Service had some basic radiological health courses **[00:05:00]** that were available and plus working with experienced people like Don James and others who had already been out here for a few years, I received a quick education and it was fun.

That's great! So what did they have you do for the first year or so?

If you look back at the history of testing, 1962, the year I showed up, happened to be the most [important year], and I'm talking about underground testing. We had a few atmospheric tests remaining before the Limited Test Ban came into effect, we had Sedan, and a large number of underground tests. I think just coincidentally there were over sixty tests in 1962, here at the test site. Running around the country side monitoring for the Plowshare test Sedan and a couple of atmospheric tests, Small Boy and Little Fellow, and a host of underground tests and some tunnel tests, not all of which [were] contained in those days, we were kept pretty busy. Our mission was to document the radiation levels offsite and look out for the health and safety of the people that lived offsite.

They assigned me an area north of the NTS where I set up monitoring equipment at ranches and in the communities. I issued film badges to residents and workers at ranches, at the police and sheriff departments, and at the highway department. We had lots of dosimeters (film badges) issued out there, just to document the radiation levels. And so that's what I did, at least for the first year. I had the Ely route. I really enjoyed the people and the country. I fell in love with Ely. It's beautiful country. And [in] some of the remote valleys that lead up from the test site into the Ely area, I met some great people who are still my friends today. The old timers are no longer with us, but I've maintained contact with their children.

That's fantastic. Yeah. Can you explain to me how you would get from the test site? Would you leave from the test site and go to Ely or would you leave from here?

As a matter of fact, I think the first year or year and a half, I lived in Mercury. Monitoring for tests was one aspect of the job. We were all issued individual trucks and we had all our monitoring equipment and our sampling equipment and so on in the trucks. And depending on the weather, the Control Point would position us downwind, in advance of the test. If nothing happened, great, we'd come back to the site. If something happened, then we'd spend the next few days monitoring out there and measuring the radiation levels. And in those days, we could monitor on the gunnery range. You can't do that [now]. Now it's more difficult. But in those days, the Nellis [Air Force Base] bombing and gunnery range was open to us, so we got to know the gunnery range pretty well, which was good because it's the buffer zone between the test site and where the general public is.

What valleys did that cover?

That covered Kawich Valley and Gold Flats, TTR [Tonopah Test Range], the valley road (Sand Springs Valley), those valleys that are now pretty well closed off.

So that was one aspect of the job. The other aspect of the job was setting up and maintaining the monitoring network that was out there. And so, just about every week, I would leave the test site, drive to Las Vegas, take, I don't remember if it was I-15 in those days, but anyway take the highway to Glendale and then up Highway 93 to Ely by way of Alamo, Caliente, and Pioche. Subsequent to that, of course, a shortcut was built from Hiko to Lund to Highway 6, then to Ely. That wasn't available to us in those days.

When did they construct that?

You know, I don't know. I don't remember when they constructed it. It was well after I had finished that aspect of the job.

So that was the main paved road.

Yeah, it was the main paved road. That was Highway 93 that ultimately goes up to Idaho, right? And so I would pretty much do that every week, go up and make the circuit, change out the dosimeters and pick up the air-sampler filters and whatever, and see all my friends. *That's great! And the circuit, it's Las Vegas and then up the 93, but where would you stop?*

My first stops would be in Ely and there I would make the film badge exchanges and pick up the samples. Then I would work my way west and south to Preston, Lund, Sunnyside, and back up to Currant on Highway 6, the road that goes ultimately to Tonopah. Then travel to Duckwater and Lockes, and the valley south of there, Railroad Valley, all the way down to the gunnery range.

How much of that was paved?

Not very much. Well, Highway 93 was paved all the way up to Ely and Highway 6 was paved. It was the old road though. Now it's all been upgraded. The road to Duckwater, which is an Indian reservation, was paved, but Railroad Valley and the other valleys were all gravel roads.

Soon after coming out from Massachusetts, I went down to Currant. And if you've ever been to Currant and you look down into Railroad Valley, you see a huge, huge valley of space with little in it. I said, wow, do I really want to go down there? I don't know what's down there. I was used to living in a big city back east where everything is convenient and everything is paved and there are buses and churches and all that kind of stuff. I thought to myself, what kind of weird people would live in Railroad Valley? As it turned out that there was a one-room grade school just outside of Currant, right off highway 6, with grades one through eight or something like that. And so I went in there and I met the teacher. Her name was Lina Sharp. She was the teacher in this one-room grade school, and she and her husband had a ranch down in Railroad Valley, about 20 miles south of the highway. So that was my introduction to Railroad Valley. Turned out that she had five daughters and she taught them all in this one room grade school. When she had a baby, she would have the baby in a carriage in the back room and [she'd] teach the rancher and Indian kids in the front. I had such a unique accent coming from Massachusetts, at least they thought it was strange, that the kids loved listening to me as did Lina. I ended up reading stories to the kids and they always welcomed me there. One time while Lina was out having a baby, I ended up teaching there for a week or so. Here I was, a government employee. [Laughing] And so that was my introduction to Lina Sharp, her husband Jim, and her five daughters. I think I was the only guy that they would allow down at the ranch because of the daughters.

I heard they were pretty.

They were and they were great kids. They were all in 4-H and they were all very busy and they were all running off to Washington, D.C. and elsewhere with their 4-H activities. I mean I was amazed at how smart they were and how busy they kept themselves. And here they lived where

the nearest town to the ranch was some seventy or eighty miles away. The nearest ranch to the Blue Eagle Ranch (Lina) was maybe four or five miles up the road toward Currant in one direction, and to the south some twenty miles down the road. It was just amazing. So it was a whole different lifestyle. I really enjoyed that. And we're still good friends today. Lina has a family reunion at the Blue Eagle Ranch in Railroad Valley every year and she invites me up there. The kids are now all married with the exception of one who is a nun. The married ones have children of their own and I wouldn't be surprised if some now have grandkids. It's a great Nevada story.

That's fantastic. Who else did you meet out there?

Many of the local ranchers. I had my favorites though, and being an Italian, one of my favorites was the Manzonie family at the Manzonie Ranch which was just up from Currant toward Ely. They used to let me sleep and eat at the ranch. One of the sons was my age. We'd often go hunting together. Here I was a government employee [laughing]. We had a lot of fun.

If you can't enjoy your job, I mean, what's the point? [Laughing]

I made the best of it. You know, the people were really great. They had their concerns about the test site, but as long as they saw you out there, and as long as they believed that we were sincere, they accepted everything that we did at the test site. They really did. At least what we were doing in those days. There were a few of families however who were there during the atmospheric testing days who believed that fallout caused some serious illnesses. For example, one of the families, the Fallini's, were related to the Bordoli family. One of the grandkids [Martin Bordoli] **[00:15:00]** died of leukemia at a ranch about midway in Railroad Valley. The Fallini's attributed that to the fallout from atmospheric testing. And you know it wasn't our job to say no, that's not correct. So they had that kind of concern. But the guys that I worked with who went out there,

did the things like I did. They [the residents of rural Nevada] always accepted us and they always accepted, again, what we did at the test site.

Would you talk with them about specifics?

In those early days, I knew generally speaking about radioactivity and the kinds of activities that were going on at the Test Site. We talked to the residents about what was going on at the site at the time. Prior to a test we would go out and say hey, we've got a test tomorrow, or something general like that, and that we will be out here for the test. As long as you did that [it was all right]. In fact, when we had Sedan, which was the large Plowshare cratering shot, the fallout went up to the north. My job was to tell the close-in residents to stay indoors while the dust cloud passes—it was really dusty but it was also radioactive as well—to stay indoors until the stuff went by as we monitored and sampled the air outside. At the Blue Eagle Ranch where the daughters were, they were inside the ranch while I was outside, with no protective clothing or anything. The radioactivity levels were low enough that it wasn't necessary that I have protective clothing or a respirator. But they always remember that, that I was outside and they were inside and I was doing the monitoring. So that was the job.

Did you see a wide variety of opinion? I mean the Fallinis.

The Fallini's were pretty good, except that they believed that the young Bordoli boy died of leukemia as a result of fallout from the site. They'll never forget. But the people at the Blue Eagle Ranch and others up there say we don't believe that there were any adverse health effects from anything that ever happened at the test site.

Did you provide them with parameters, like what they could do, what they couldn't do, like maybe if they had a vegetable garden, or a cow, or cattle?

Yes. Iodine was an issue in those days. Radioiodine in milk and children drinking the milk was a big issue. We knew where all of the family cows were, and we knew where all of the dairies were. If they were within the path of the fallout, then we would sample the milk and if contaminated, tell those with family cows not to drink the milk. We would replace it with store-bought milk, for example, for that period of time. For the dairies, there were a number of options available. The iodine is a fairly short-lived radioisotope and it therefore decays fairly quickly. Yeah, we would do that sort of thing.

I'm going to ask this question because I really don't understand, and I've only thought about it very recently. It's more of a practical question as to how radiation functions. But let's say you have a milk cow, and you have a beef cow. What would be the difference between how you handle exposure to either of those animals?

Well, you're concerned with contaminated milk, only because it's a food pathway for kids and adults. If they drink the contaminated milk, the radioiodine will concentrate in the thyroid. For children with a small thyroid, that could be a problem. We weren't concerned about beef cattle and the uptake into muscle, bone, and so on for the underground testing program. There was just not enough fallout for that to be a concern.

Now, if you go back into the history of the test site, the Public Health Service ran a farm on the test site with milk cows and beef cows, which was later operated by the EPA [Environmental Protection Agency]. Again the farm had dairy and beef cows out there. It was located just north of Sedan in Area 15. The dairy cows were really research animals. We had alfalfa fields and we would purposely contaminate the fields with radioiodine for example and feed the alfalfa to the milk cows to observe the uptake in milk, and look at those transfers. The beef cattle however roamed around the north end of the test site. Occasionally some would be

sacrificed to measure the uptake of radioisotopes in muscle and bone. The uptake in beef cows and then the transfer to people by eating meat was not a concern from underground testing. But we were concerned about the contamination of milk and the thyroid exposure to children.

OK. And the radioactive molecules, iodine-131. What else were you tracking?

[00:20:00] We were tracking just about anything that was detectable, like strontium, cesium, and iodine, principally the beta and gamma emitters.

OK. And when I say "you," as in general "you," is that the Public Health Service?

The Public Health Service was responsible for the offsite safety program from 1954 to 1970. In 1970, EPA was created, and a lot of the radiation programs from various federal agencies were taken over by the EPA, including some of those within the PHS. So a number of commissioned officers in 1970 were detailed to EPA. I was detailed to EPA from 1970 until I retired in 1992, but I was a Public Health Service officer. While I was detailed to EPA, I ended up directing the offsite safety program for them.

Let me have you go back and explain the general trajectory of your career, then. Public Health Service monitor in 1962. And then?

OK, so, good question. I was a Public Health Service monitor for the first couple of years (1962-1964). I was assigned to the Southwestern Radiological Health Lab (SWRHL). The laboratory was located here on the campus of the university [University of Nevada, Las Vegas, UNLV]. We also had a field laboratory and offices out at Mercury. Anyway, Captain [Oliver] Placak, Director of SWRHL, said, `You know, maybe we should send you back to school to learn about what you've been doing for the last couple of years.` And so I ended up at the University of Michigan, for a couple of years, fully paid for, and I eventually ended up getting a master's degree in environmental sciences. It was principally health physics. I also had

a two-year assignment in Wisconsin, assisting the state health department with their radiological health program.

So I was gone for four years from the summer of ’64 to May of ’68, I believe it was. And when I left Nevada, although at times it was exciting, I said, well, maybe I’ve had enough of this stuff. Maybe I’ll not go back to Nevada and I’ll try something else. But, while I was gone, the more I thought about it, the more I realized I had a lot of fun and it was challenging and necessary work. In the interim I stayed in touch with one of the deputy directors, Jack McBride. He just passed away a year or so ago. Jack said, `Why don’t you come back.` I came back to Nevada and I’ve been here ever since.

So when I came back with a master’s degree in health physics, I started moving up: branch chief for field operations and then as the division director for the whole program. And in those early years, Jack McBride nominated me (Department of Energy) to sit on the DOE Test Managers Safety Advisory Panel as the offsite safety advisor. This was a key position and something that I had aspired to do. Jack, one other manager, and me split up the duties. And so Jack and I and the other manager would split up the shots. Eventually with retirements, I became the main offsite advisor. I have to attribute a lot of my success to Jack McBride.

Great! And some of the men that you worked with, during these periods?

Well, Don James for sure in the field. But I worked with lots of Public Health Service commissioned officers in those early years. Many of them did their two years and then went back to their home base or whatever, to different careers. There were a few of us that stayed with the program here in Nevada. I think I probably have stayed the longest of anyone with the program, in particular as the safety advisor for the NTS tests. I ended up meeting a lot of really neat people from the laboratories, the DOE and the contractors. I retired from the Public Health

Service in 1992. I was required to retire after 30 years of service. I'm not sure I would have wanted to stay any longer than that anyway. That's when Dr. Jay Norman, Director of the Field Test Division (J-Division) at Los Alamos National Laboratory, [LANL] hired me.

Oh, you did! I didn't know that.

Yes. I spent thirty years with the Public Health Service and then I spent sixteen years with the Los Alamos National Lab.

So that makes about three, four different careers, in total.

There's two right there, for sure. And now I do a lot of volunteering.

What did you do for Los Alamos?

I started out being the resident manager at the test site for the permanent party. There was always a permanent party that lived here in Las Vegas. Their duty station was the test site. But then **[00:25:00]** when we had a Los Alamos nuclear test, the physicists and other folks flew in from New Mexico. They'd go back and forth to the home lab until the test was conducted. So I started out as a resident manager. However I always wanted to be a test director. When I was in the Public Health Service or assigned to EP A, I always looked up to the test directors and always wanted to become one. And so, I had the opportunity. It turned out that when I went to work for Los Alamos, many of the old-timers were retiring. A job opportunity for a test director came up and I applied. I think I was turned down the first time, but the second time I got it and it was a dream come true.

That's great. Who were the old-timers that were retiring?

Guys that I have a tremendous amount of respect for [at] Los Alamos were the former Test Directors, namely Walt Wolff, Tom Scolman, Dick Tatro, and Bob Campbell. And one who just passed away, Elmer Sowder. Elmer just passed away last week or the week before. I always had

a lot of respect for these guys because the test director was the king of the roost out here at the test site. He had the experience and he ran the entire test, from cradle to grave. Anyway, I always wanted to do that. So in 1998, I think it was, I became a test director and I ended up being a test director for a number of the subcritical experiments for Los Alamos.

I think my boss, Mary Palevsky, wants to talk to you about that in greater depth, so she'll probably give you a call here, not [in] too many days, because she's going to Washington, D.C. so there may not be time [before that]. So she might catch up with you in July, too. But that's very interesting work. What made you want to be a test director?

Maybe my ego, I don't know.

Oh, I get that. [Laughing] That would've been my reason.

Well, I always thought the main reason why we were out there was to conduct nuclear tests. I mean that was the principal reason and the test director managed the whole operation. The test director dealt with the contractors that were supporting the tests including the crafts all the way up to the physicists that came out from the laboratory, I mean the brainpower. The test director managed a large group of people, sometimes three or four hundred people, to execute a test.

How did you find out that you had a managerial talent?

Oh, I don't know. You know, I never thought I had talent in anything, but people said that I always had the ability to work with people. It started out early in my career with just meeting the ranchers and folks, the Public Health people out in the communities, the highway department, the police department, and so on. So I had experience there. And part of my responsibility was to give talks at ranchers' houses or in local communities about what we were doing at the test site and how we were looking out for the safety of the people. So I did a lot of that. And one of the side jobs was when the *Exxon Valdez* oil spill occurred [1989]. My boss in D.C., who I had

worked with in Las Vegas, called me up and said, Would you go to Alaska and set up an operation up there to support Exxon and manage the EPA bioremediation project there. And so I got involved with that for two years, and I think it's as a result of being able to work with different agencies.

What year was Exxon?

That was in 1989. So in March of '89, late March I think it was, when, [Captain Joseph] Hazelwood, ran across the Bligh Reef there in Prince William Sound. Eleven million gallons of crude was spilled to Prince William Sound. Life became **[00:30:00]** very chaotic there and it was still very wintry up there. In May I went up to Valdez [Alaska] and the place was just overrun with Exxon, the State of Alaska and the [United States] Coast Guard [USCG] and everybody and their brother. There wasn't a place available to set up an operation. So I had to figure out how to do that, to bring up a team to start working with Exxon on a bioremediation program.

I know this doesn't have anything to do necessarily with the radiation monitoring but I'd love to know more about that actually. So for two years you guys set up an operation to do—

We set up an operation in Valdez, and after some negotiation with Exxon, got in-kind support from Exxon. In-kind support included two commercial fishing vessels and a helicopter and float plane. So I went up there, I don't know exactly when it was, late April or early May. I arrived in Valdez and everything including motels, trailers, office space and homes were rented out. I went to the Bear Paw Campground right in the center of Valdez and met the owner. His name was Bill Wyatt. I said Bill, I got a problem. I've got to bring some people in. Where are we going to stay? Well, he had a couple of camping spots open at the time. We brought a few trailers in from Anchorage [Alaska] and, I don't know, there must've been four or five of us to a camping trailer for a little while. And Bill also said, But in the meantime, I'm

trying to open up a campground down on the water. And he said, But things are so chaotic, I can't get anybody to help build the camp ground and infrastructure down there. However he said,I will do my best to build an office if you will rent it for two years. I had no authority to promise anything, but I signed a piece of paper saying I would rent it for two years. I mean it was an emergency, right?

So I did that and within a couple of months there was an office erected at the new campground. We brought in several trailers from Anchorage for personnel and we started to build up [a facility]. Anyway, we now had a place to work out of. As mentioned earlier, Exxon supplied me with a helicopter and a float plane for transportation to the sound and a couple of fishing vessels that could be used for living quarters and laboratory space on station. We stationed the fishing vessels in a place call Snug Harbor, in Prince William Sound, that had moderately oiled beaches. We set up our outdoor laboratories (test plots) there. We tested a number of chemical products and it turned out that one of the products really worked out well. We set up test plots on an oily beach and we'd spray different products on the test plots to see if you could eventually break down the oil. One French produced material worked out really well. We brought down the Coast Guard's Admiral Robbins, the on-site commander, to show him the clean test plots versus untreated plots, and he said, Wow, this is great! Admiral Robbins talked with Exxon and before you know it, there were 707s flying into Anchorage with drums and drums of this stuff. It was an oleophilic material that you could spray on the oil. It sticks to the oil, and in the process, it would slowly release nitrogen and phosphorus which is what the natural oil-degrading bacteria really needed to flourish and increase in numbers. So they had the nutrients, they had the oxygen in the water, and they had the oil which they loved. These were natural bacteria that are always there.

That's so interesting, because all we heard about it in the general news was the use of this stuff. They didn't explain.

Exxon used the material late the first year, and I think all of the second year.

You called it an oily—

Oleophilic fertilizer is what it was. Oleophilic means it sticks to the oil, so that when the tides go in and out, it doesn't wash out with the tides. The fishing vessels that they assigned to us, were anchored right there where our test plots were. They just stayed right there with the crews so they didn't have to go back and forth to Valdez.

And it was your team that made the tests to figure out what would work.

[00:35:00] Yeah, I was more the operations manager. The brain power for the project came with the microbiologists and biochemists. They provided the technical direction and did the real work.

That's amazing work. That's amazing work.

Yeah. It turned out the product would work on beaches that were not heavily oiled—if a beach was heavily oiled, Exxon would have to go in with mechanical means to reduce the amount of available oil. They had these large booms which were supplied with hot water under high pressure. They would direct the oil back out into the water where it was confined within booms, and then with skimmers, pick up the oil. But there was still oil remaining on the rocks and in the sediment. Exxon had teams that went in and sprayed the oleophilic material on those rocks. Or if it was just lightly or moderately oiled, you just applied the product and that was your means of getting bacteria to break down the oil. After a couple of years the beaches were much improved. But just remember, Mother Nature would have taken care of it anyway, but it would have taken a little longer.

Did this have any effect on the animals, not the oil but the cleanup process?

Well, it did initially because of direct contact with the oil. Birds for example got oil on their feathers and otters on their fur and so on. There were lots of animals that died, but it's such a prolific area that the numbers recovered rapidly. Let me tell you, Prince William Sound is a beautiful, beautiful area, one of the prettiest places on earth.

That's what I've heard. That's what my sister says.

So if you ever get an opportunity to go up there, I would do that.

Anyway, that was a pleasant distraction for me. I'd come back to the NTS every three weeks or so, spend a week at the test site and then go back up to Alaska again. It was a lot of fun.

Did you conduct any similar activities in the test site area?

No.

Or was it just not that heavily contaminated? It was too different—

It was two different approaches, cleaning rocky beaches and sediment contaminated with oil versus cleaning contaminated (radioactive) soil. I did not get involved with the latter.

Wow! I'm going to take you back to the ranchers. There was one lingering question I had about the equipment. Can you tell me more about what equipment you used and how that equipment changed over time?

Yes, in the field we used hand held survey instruments, namely Geiger counters, ion chambers, and scintillators. [Photographs 1 and 2] These were the radiation detectors that were available at the time. I mean they were the best available at the time. The air sampler was like a vacuum cleaner pulling air through a filter, to collect the particulates on the filters. And in those days we issued film badges, much like dental film, to measure the gamma exposure, the integrated exposure to a person. [Photograph 3]

So, I mean we had the best that was available at the time. But as the years went by, equipment got better and more sensitive. We went from film badges to thermoluminescent dosimeters and the sampling equipment got better and the monitoring instruments got more sensitive. Now you've got pressurized ion chambers that'll measure right down to the microR/hour level.

Does the [Atomic Testing] Museum have—I've seen the Geiger counters, but do they have other equipment?

We have some equipment but certainly not the full spectrum. I mean we've got a pretty good display of survey instruments downstairs, some of the older ones, in fact a lot of the stuff that I used. I think there's one air sampler down there, or maybe a couple of them.

Would you mind terribly if after we're done up here we—

Yeah, I could take you down.

And would it be possible for me to get a photograph?

Sure. Sure.

Because nobody has really ever talked about any of this equipment except in the manuals that you used, at least the few that I've seen.

Yes, we could take pictures of it.

And the brands of these things, or the manufacturers?

Eberline [Services] and Victoreen were big in those days. I'm sure there were others, but off the top of my head I don't remember what they were.

When you went to change something out at the permanent stations, what were you changing out?

We collected the filters (particulates) and charcoal cartridges (radioiodine) from the air samplers. If you had a test and you released radioactivity to the atmosphere, you might change out your

filter and cartridge on a daily basis. If there was nothing going on you might change them out once a week, for example. And so, it just depended on what was happening. And with film badges you'd do the same thing. We would leave the film badges out until the **[00:40:00]** radioactive cloud had passed, then you would change out the film badges on people and issue them a new one.

Did you have trouble with the people wearing them?

Not very often. They wore them very well. Occasionally one was lost or run through a washing machine.

Yeah, but that would've been light. They would have forgotten about it.

But no, they were very good. And so those records are somewhere. I would imagine right here in this building with Martha DeMarre and the NTS archives.

She's still around.

Yeah, she's still around.

OK, I'll have to see her for some of those. And the Southwest Radiological Laboratory published some reports about offsite monitoring and then the EPA picked it up.

Yeah. Right.

So the Public Health Service used the Southwest Radiological laboratory.

Well, that was the name of the PHS laboratory. Later, under the EPA, the names changed over the years: Environmental Monitoring Systems Laboratory or something like that. But the focus, at least in my end of the business, was always supporting the test site and the activities at the test site.

OK. Are the EPA buildings here on the UNLV campus those same buildings?

Yes, they're the same buildings except the original one that I reported to has been turned back over to the university. A few of the other buildings that EPA still occupies, are ones where we had laboratory people. Yeah, those are some of the original buildings.

I made sure I walked past them this morning so I could remember to ask that question because the university has a very short memory about some of these things, at least the administration around nowadays.

So you met with the Fallinis, you met with the Sharps and the Manzonies, and you would stay at the Manzonies, on occasion. Was there anywhere else you'd stay or spend more time?

I spent quite a bit of time at the Manzonie Ranch and at the Blue Eagle Ranch [with] Lina Sharp and her husband. Let's see, I was going to say Roy, but that was the brother. Jim Sharp was the husband. And I mean these are very intelligent people. Jim I think at the time was the president of the Nevada Cattlemen's Association. And they had the five daughters and all were well educated. I'd stay at the ranch, but I'd camp out in my truck. [Laughing] So I did that, and then I'd also stay at the fire station in Ely. I had a buddy there that put me up in the fire station. You know, in the service I was making about $250.00 a month (salary) or something like that. So what I can make on per diem I could save. They didn't charge me anything at the fire station.

That's great. Ely's a nice town. Has it grown over the years?

It is a nice town. Lately it has [grown] and there are a lot of new homes. As you head north out of Ely or when you're coming into Ely from the south, there are some really very nice homes, especially near Cummings Lake and Cave Lake. When I was there in the early 60's, Kennecott Copper was the main industry. They were quite active and they had a large open pit outside Ely and the mill was in McGill [Nevada] to the north. Again, the open pit was right outside of Ely and the ore was shipped via railroad to the mill.

Oh, can you see the pit from Highway 6?

Yeah, you can see the pit, or at least the tailings anyway.

Wow. I wondered what that was. That's Kennecott Copper.

That's Kennecott Copper. Then the copper prices fell dramatically, but I was gone by that time. I think some mining activity is coming back. I don't know if it's still Kennecott or not [Quadra Mining, Ltd.]. It's just a function of what the prices of copper [are].

Are doing on the open market. So who would you see in Ely? You had a friend at the fire station.

Yeah, I had a friend at the fire station. I'd see all of the people that I had film badges on, and we had the sampling station there at Junction Motors in Ely.

Where was the auto place located?

It was Junction Motors, which no longer exists. As you come into Ely from the south, you almost ran into Junction Motors. It was right there at that intersection.

OK. At the T-intersection.

At that T-intersection just a little bit to the left, on the north side. Yeah, it was a Pontiac auto place.

Wow. These are practical questions. Where did you eat when you were on the road? What did you do for food?

If people offered me food, I accepted it. And when I stayed at the Manzonies they were always **[00:45:00]** good for steaks and I was usually fed at the Blue [Eagle Ranch]. Folks were very nice out there. But, you know, you carry your own goodies as well. But in the evening if I stayed in Ely, I'd have dinner out.

Where was your favorite restaurant in Ely?

You know, I don't remember. I don't remember. I'd sometimes eat in the old Hotel Nevada or the Basque restaurant. But I really don't remember.

Has that steakhouse, the Jailhouse—

The Jailhouse [Hotel and Casino] is still there.

Has that been there for a while?

It's been there for a while, but it wasn't there when I was running around in the early sixties.

OK. I wondered about that. I wondered how long that establishment had been around.

And I think I'm the only guy that ever had five girls in his government vehicle at the same time.

That's impressive.

But they were all the Sharp daughters. [Laughing] I remember I was down at the ranch and they wanted to take a ride. I said, OK, let's take a ride. I think I had a couple in front with me and about three in the bed of the truck. We went down toward Nyala and up over what they call Cherry Creek Summit to Adaven. Have you ever heard of that?

Yeah, I have.

The girls hadn't been there in a long time so—then we drove by the Uhalde Ranch and Mrs. [Helen] Uhalde—and I think she's still alive.

She is. She is. I saw her.

Sometime later when I saw Helen, she said, `You know, you had all of the Sharp kids and you never stopped to say hello, you know.` [Laughing] So I'll never forget that. That was fun.

That road comes down—I've been to the Uhalde Ranch, and the road comes—I can't figure out how to get up and over. I know the pass road does go up and over.

Right. The Cherry Creek Summit Road.

Cherry Creek Summit Road. Do you have to drive past the Uhalde Ranch and then the road forks?

Yeah. Yeah, and you end up driving by the alfalfa fields there and you keep going up the valley, past Adaven. I think the Uhaldes just bought the Adaven place. They own all of that now. And then you go up over the summit, over to the other side, past the old Bordoli Ranch, and then you drop down into Railroad Valley, right there almost near Nyala.

Now that road isn't paved.

No, no, no.

Who maintains it?

I believe the county [Nye County] puts a blade on it every once in a while. But that's a pretty area. I like it.

How did you find your way around?

I didn't initially. During my first year out there, it was not uncommon for me to get lost when driving these huge valleys north of the test site? So here I am, coming out of a large city back east and when we'd have a nuclear test and there was a release, I would be directed to monitor in these valleys. That's how I met Mrs. Uhalde. I think I was over by—it wasn't Rachel [Nevada] then, but I went up Sands Spring valley, and I was all by myself. I was running out of gas and monitoring at the same time. I really didn't know where I was. I ended up taking the road into the Uhalde Ranch. I had never been there before. Mrs. Uhalde was about ready to take some food out to the sheep herders in the valley below the ranch. She had a flat tire and I was really low on gas and just about panicking because I had never been out in this country before. I'd radio in to the Control Point and say, `Well, where am I? Where do you think I am?` [And they would say], `Well, what do you see around you, you know?` [And I would say], `I`

don't know. I see hills and mountains and so on. And so I ended up changing her tire and she ended up giving me some gas and some directions on how to get out of there, and that's how I met Mrs. Uhalde.

That's amazing. That's probably the thing that confounds me most is how do you find your way around?

Yeah, and in those days they didn't have the [United States] Forest Service [USFS] signs with arrows pointing to different locations. They're all gravel road, right? And there were lots of roads coming in and going out. But you know, after a while, you learn the country. It was important to learn the main geographical features, for example keeping Worthington Peak on your right or left, whichever valley you're coming in. So you look at those physical markers and that's how you best know which direction to go. After a while it's secondhand. I nearly panicked in those early days. I used to say [to myself], what am I doing out here?

Did you have to keep a mental list in your head of, OK, so after this much time, after this many miles, I have to remember that I need gas?

I would just look at the gauge and say, well, it's going down and it's going down, and what am I going to do? We normally carried extra gas for situations like that.

What would you do?

[00:50:00] Well, you know, if I was really in trouble, I'm sure the test site would've sent helicopters or something out to find me. [Laughing]

Now you said you called them, and they said, you know, where are you? How did you call them? This is before cell phones.

We had pretty good communications. It was called Net-12 radio. That was the radio frequency that was used by not only us but also the [National] Weather Service Support Office to the test

site. The Weather Service sent out their pi-ballers (technicians that released and tracked weather balloons) around the test site in those early days. So the Public Health Service monitors, and then the EPA later, used Net-12 for communications.

So you never were out there just left to your own devices.

You could get into areas where you didn't have communications because of the topography, yeah. It certainly could happen.

Were those areas the low-lying areas?

Yes, generally areas blocked by mountains. But we had pretty good coverage in all with repeaters on peaks at different places. However, there were areas that weren't covered.

Wow, that's great. Did that make you feel better, feel a little bit more secure?

Not until she [Helen Uhalde] gave me gasoline and told me how to get out of there. [Laughing] I was mostly a coward, I think, in those days. I was not an adventurer, especially out in this country.

Yeah, well, people forget.

It's summer and it's hot, and dusty.

Yeah. Did you carry water with you?

We carried water, but we did not have air conditioning. No air conditioning in those days.

What truck did you drive?

It had a Public Health Service license plate, PHS-something-or-other, and it was a 1962 Ford, brand-new stick shift, and I loved it.

Did everybody get one of those?

No, not everybody got [one]. There were also test site-issued (AEC) vehicles.

What model of Ford was it, do you remember?

It was a two-door pickup, F-150. It was a half-ton but not four-wheel-drive.

Did you have to weight the back, driving on the dirt roads?

You know, we had so much gear in the back anyway, you didn't really have to put any additional weight. We always carried air samplers and monitoring equipment, extra gasoline, water, etc..

That's fantastic. Is that the replacement equipment?

No. If there was a venting or a leak of radioactivity as a result of a test, we would be directed into the downwind area to set up temporary monitoring stations. Often it was in the boonies where they thought the fallout was going to go or at a ranch or community, just to document the radiation levels. So we carried a generator and an assortment of monitoring and sampling equipment.

Did you have a better understanding of the geography, because you drove it, than the people who sent you out, or did they already know where they wanted you to [go]?

Most of the people that directed the field operation, like Jack Coogan and a fellow by the name of Dan Wait who has since passed away, had already been out in this country and knew it very well. Later on after driving much of the country and certainly after flying test site related missions with the Air Force or in PHS aircraft over the site, gunnery range, and offsite, I got to know the country quite well where even I could direct people.

In 1963, Secretary of the Interior Stewart Udall established a wild horse range on the northern end of the gunnery [range]. Did you have any interaction with that area at all?

You know, I used to fly with the [United States] Air Force [USAF] and we used to count horses.

Oh! The Air Force did the head counts. That's interesting. But you didn't drive through that area?

Oh, I used to drive through it while monitoring, yeah, but not counting horses. We used to count horses from the air. There were lots of horses out in those days.

Are you a pilot?

No. I was just a crewmember.

You would just ride? Did you like to fly?

Oh, I loved to fly, yeah. I loved to fly because I was making, I'm trying to remember, $110 a month flight pay. The Public Health Service is a uniformed service and crew members received flight pay. That helped out since I was only making, what, two-fifty a month. So the per diem and the flight pay really helped out.

So if you agreed to fly, they'd give you extra pay.

A hundred and ten bucks a month.

Why?

Well, because it's a little more hazardous, I guess. Yeah. I think they still do that in the military.

And the Air Force would take you up.

[00:55:00] Yeah, we'd fly out of Indian Springs [Nevada] and do the head counts. I don't know who was using the information, whether it was the Air Force, DOE or the BLM. There were a lot of horses, especially up around the Tonopah Test Range in those days. So that was fun. You'd get to learn the country really well that way. So we did that.

You were one other place, I think. I may be mistaken about this but when I talked to Jack Coogan he pulled out some old photographs, up in Alaska, when you guys were doing some monitoring up there, and I think you were in a couple of those photographs. Am I remembering that correctly?

I know Jack went up to Alaska on a couple of Plowshare projects I believe. I did not go up to Alaska other than for the *Exxon Valdez* oil spill. That was my first experience with Alaska. I shouldn't say that. I did go up to Amchitka [Alaska], out in the Aleutian Islands. I was there for the Cannikin underground test in 1971.

OK. And that was part of the monitoring.

That was part of the monitoring. My particular job was teaming with another fellow by the name of Vern Andrews. We were in an Air Force C-130 and we were the cloud trackers. If something came out of the ground, we were to track the material.

"Out of the ground." That means vented?

Yeah, vented or seeped or whatever. But nothing came out. And so I was in a C-130, flying slightly upwind, looking down, flying from the Pacific side of the island. If you know what Amchitka looks like, it's a very long, slender island. The Pacific Ocean is on one side and the Bering Sea is on the other. We were flying from the Pacific toward the Bering Sea and looking off to the left when Cannikin went off. We saw the ground shock and the Bering Sea turn into a white froth.

You saw it from the air?

Yeah, and also heard a little *ping* against the fuselage of the 130. A shock wave developed as a result of the ground heaving up so much. I had never heard that before. Just a little *ping*. I mean it was very noticeable.

And it was just the air being moved against the airplane.

Right.

Wow. I never even thought of that.

Yeah. But I think Jack [Coogan] was on a couple of projects up there in Alaska, on mainland Alaska, and I don't know too much about that.

OK. I can't remember off the top of my head right now.

But I went up to Amchitka almost [every year] following the Cannikin test. The University of Washington was responsible for the long-term water monitoring for the first few years following the test. After a few years we were responsible for the water monitoring program. I would go up to Amchitka almost every year once we took over the program and take water samples and so on.

OK. The water monitoring program, that was the one that took samples after tests had been done, over a period of time.

Yes, we did that at all of the shot sites, you know, New Mexico, Colorado, Mississippi.

Did you go on these assignments?

Yes, I did. I went to most of them. I don't think I ever made it down—well, I did. I think I've been to all of them.

Were there ranchers at all of them?

It was the same sort of thing as around here, yeah. We would sample water from the ranches and communities in close proximity [to the test] or [in] some of the hydrological test holes that were drilled for the purpose of monitoring that were drilled by the government. Yeah, so we would do that.

Do you remember any of the other ranchers?

I remember Mississippi because there was a local farmer that we got along really well with. He had a pretty good size catfish pond.

Fishing!

Well, not fishing but eating, catfish, crawdads and hush puppies. They'd cook up the crawdads and stuff and we'd buy the beer. So it was fun.

What was his name?

You would ask me that. Don James knew him very well. It was [Billy Ray Anderson]

If you don't remember, we'll drag it up somewhere.

It'll come to me. But they were a great bunch of people. [Photographs 4-7]

That's great. And you went to Colorado.

Went to Colorado, New Mexico.

Two tests in Colorado?

There were two tests in Colorado. There was Rulison and Rio Blanco. There were two tests in New Mexico. There was Project Gnome down by Carlsbad [New Mexico] and Project Gasbuggy, the gas stimulation shot, near Farmington [New Mexico]. And then we had Project Shoal up by Fallon [Nevada], and Faultless which was near Warm Springs [Nevada].

Is there a ranch near there?

Hot Creek Ranch.

OK. And who's there?

It used to be the Titus's. I don't know who's there now. Then you had Amchitka. Then you had the test site.

Wow! You covered a lot of geographic area.

Yeah, we also went out to Enewetak in the Marshall Islands. We did a lot of the monitoring out at Enewetak, years after the completion of atmospheric testing.

[01:00:00] *Yeah, yeah. Did they do some environmental, what is that word, it's not rehabilitation or reconstruction but—*

At Enewetak, yeah, in anticipation of bringing the natives back to the island.

Were you a part of that program?

I was out there. This is even before the natives were brought back and any kind of cleanup was started. The Air Force wanted to conduct some high-explosive cratering shots on certain islands, to simulate a nuclear test. They were concerned about the radiological conditions on the islands. A couple of us went out there and we went to every island in the atoll. Knowing what had been done there earlier, we surveyed each of the islands. We had some surprises about where the contamination was and what the levels were. [Photograph 8]

I think that's about all the questions I had. Oh, one more. Unless you have anything else to [add].

I can't think of [anything]. One of the nice things about the job was its uniqueness. It was so unique that, you know, it'll never be replicated again that I can think of.

And why not?

Well, I mean if we go back to nuclear weapons testing, and I don't see that really happening, it will be to address some technical issues. As a result it would only need a few tests at most. I don't seeing us going back to an all-year-round testing program. I don't think you'll ever see that.

Yeah. Yeah. Did you ever work with Kenny Giles?

Oh yeah. He worked for me. Don James worked for me as well.

So Don James worked for Jack Coogan.

Well, we all worked for Jack Coogan at one point, but then as I moved up, then everybody ended up working for me.

That's great. It's good to be the boss.

They were my favorite people. Kenny Giles and Don James were just good, good field people, very good field people. They got along with the offsite residents very, very well.

Well, it sounds like you all did. It sounds like you all did. I mean the Uhaldes speak very highly of everybody. That's great.

Yes. And I think it's hard to say that our piece of the pie, so to speak, made the test program successful out here, at least as successful as it could be. Did we play a big role in that? It was hard for us to envision that we played a big role as opposed to the laboratories doing their stuff and the contractors. But we did. There were people within the Atomic Energy Commission and then later the Department of Energy and the laboratories [who believed] that offsite safety was extremely important, you know, to work with the people out there. I think our program and the way we conducted it was a big reason why the test program was accepted by the public.

Is the CEMP program, the Community Environmental Monitoring Program, is that the correct [name]?

Yeah, CEMP, Community Environmental Monitoring Program, that DRI [Desert Research Institute] now runs.

Yeah. Is that the next generation of what you guys did?

That is. Yeah, it is. It is the next generation. You know, we always had permanent networks out there of air samplers and dosimeters and gamma radiation recorders and so on. And there was another part that we didn't even talk about. When Three Mile Island happened, my team was sent back there with a lot of the same gear we used around the test site. We got there, I think, the day after the accident began. We set up a lot of the monitoring equipment around the island, out in the communities, just like we would here.

[01:04:14] [Telephone rings at this point. Recorder is turned off and then turned back on.]

We were talking about Three Mile Island. We spent quite a bit of time at Three Mile Island, doing a lot of the things that we did here, and we did this with the acceptance of the local, state, and federal agencies. As time went by, we found out that the residents did not believe anything that the government said. And so we started putting equipment out in the communities where the residents actually ran the equipment. And so **[01:05:00]** that led into now what we call the community environmental monitoring station program here. We brought the concept back from our experience at Three Mile Island. Bruce Church and I got together to talk about it and that's when Bruce said, `Hey, wouldn't it be great to have DRI manage the whole program, EPA would run it, well, keep things going, and we'll hire people in the communities, like science teachers and so on, to run the equipment and be the community spokesmen.` And so that's how that all got started.

And what difference has that made, do you think?

Well, you know, right now it's hard to say what difference it makes because we're not doing the traditional nuclear weapons testing. However, I think back in those days when we started, I think the communities really accepted it because they had a local person that they could go to. And DRI would bring these people in every once in a while and we'd train them and talk with them about issues and so on. So, we kept them up to date on what was going on at the test site. But of course the testing program ended in 1992.

Yeah. It seems that there's an emotional response people have, and then there's the science. And you had maybe the unfortunate position of having to try to make those two work together.

Right. And I think we did a pretty good job at it. We were never in the business of telling folks, hey, you know, there's not a higher incidence of cancers out here. Those people did not receive cancer or leukemia as a result of anything we did at the test site. We weren't there to do that. We

were there to just give them the facts as to what was going on at the test site, what we found in the samples, the numbers, and what it might relate to. They'd make up their own minds.

And them making up their own minds, do you think, was key to—

Well, I think that helped out. We weren't talking down to them. We were talking like they were part of us. We weren't the big heavyweight government guys, you know, running around.

Did that happen before?

Yeah, I think so because in those early days, especially in the fifties during the atmospheric testing days, tests were done on a campaign basis. You'd have four or five tests over a few month period and the teams came in from the laboratories. I think in the very early days it was the military that was responsible for the offsite monitoring. However, as soon as the test series was finished, everybody would disappear. So the [Nevada residents] had nobody to talk with. Later on when the Public Health Service took over the program and later EPA, the residents had someone to talk with. During the underground testing program, we had people out there all the time. I used to tell the monitors, `I don't care if I ever see you during the week, you just stay out there with the public, let them know what's going on.` That's what Jamesy and Giles [did]. That's why they were so successful. That's why they did so well.

Because they established these personal relationships.

Rapport with the people, yeah.

That's fantastic. That's great. Well, how you doing? Have I talked you out? [Laughing]

[Laughing] No, I'm willing to stay here as long as you want.

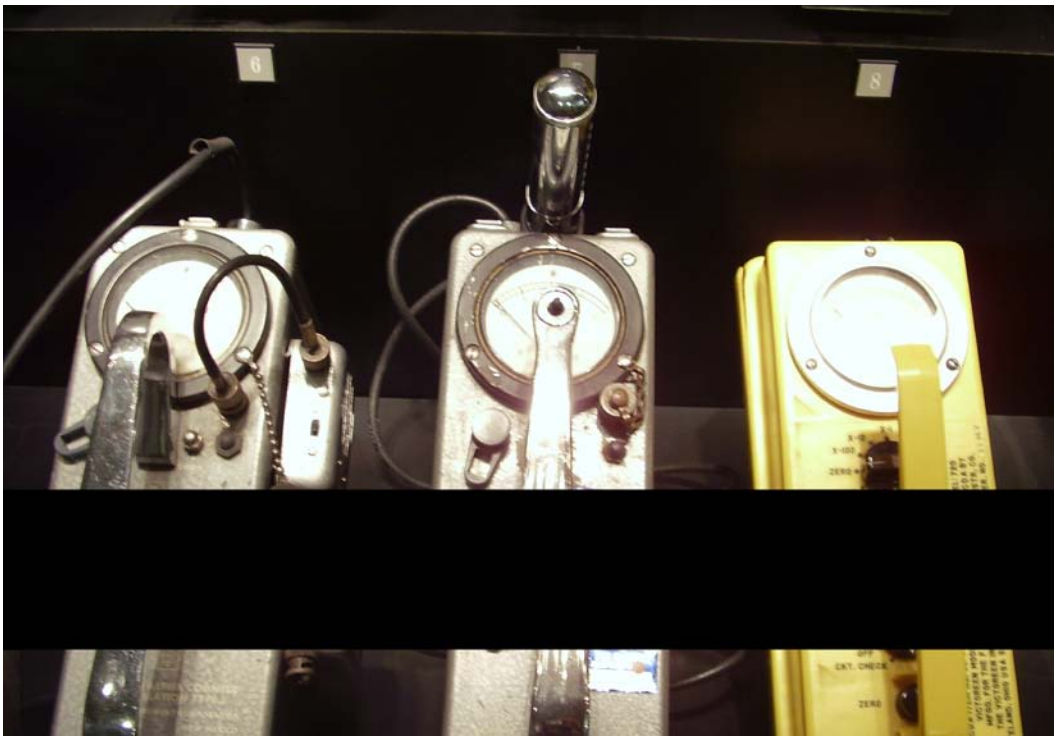
I think we'll call it for today.

OK.

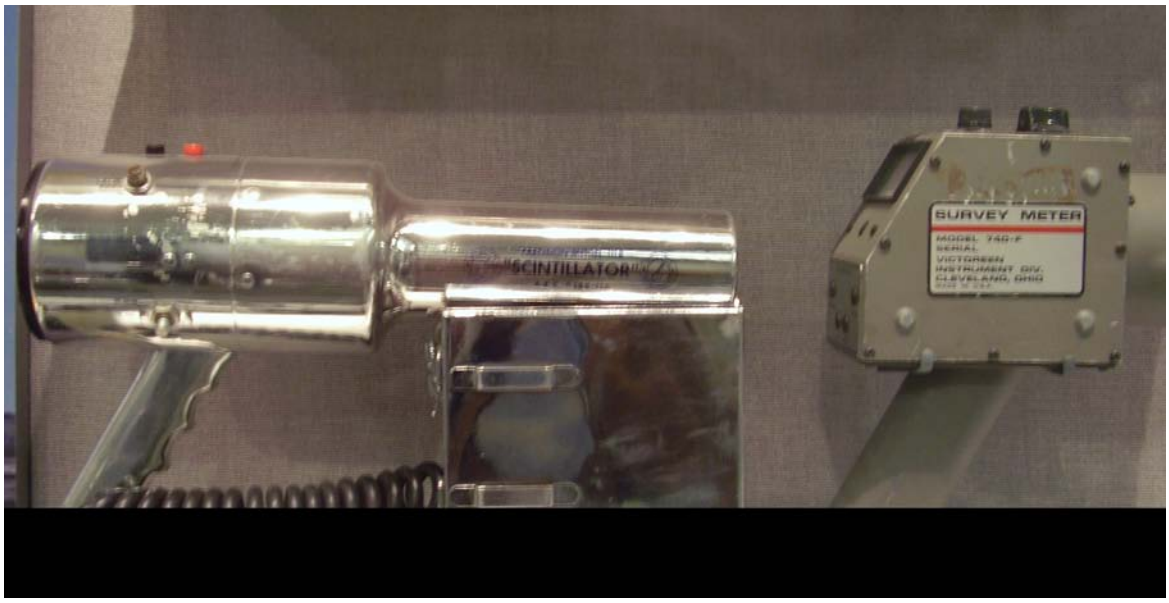
[01:08:32] End Track 2, Disc 1.

[End of recorded interview]

Photographs in Text



1 – Geiger counters on display at the Atomic Testing Museum in Las Vegas, Nevada.



2 – An Eberline scintillator on display at the Atomic Testing Museum in Las Vegas, Nevada.

3 – Film badges on display at the Atomic Testing Museum in Las Vegas, Nevada.

4 – Charles Cost flying to the Project Dribble site in Mississippi in 1977.

5 – Charles Cost in foreground at the Project Dribble site in Mississippi in 1978.

6 – From left to right Jerry Dorne, Don James, Charles Costa, and an unidentified EPA worker at the Project Dribble site in 1978.

7 – Charles Costa far left at the Project Dribble site in Mississippi during the drillback in 1979.

8 – Charles Costa in the foreground on Enewetak Island "roughing it island style" in 1973. Don James is second from left.