

GLEN ZUMWALT
Oral History Interview

Statewide Oral History Project, Abandoned Mines Reclamation Program
Utah Division of Oil, Gas and Mining

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This is Lee Bennett and I'm here today at the home of Glen Zumwalt in Leeds, Utah, to interview him about his experiences in the coal industry of Utah. With me is Jim Mattingly who is recording the interview.

LB: To get started I'd like you to give me your name, your date of birth, where you were born, and where you live now.

GZ: My name's Glen Zumwalt. My date of birth is November 23, 1940. I was born in Garden City, Kansas, actually grew up in Peoria, Illinois, and live now in Leeds, Utah.

LB: Thank you. How is it that you came to be involved in mining in Utah?

GZ: That's a long, circuitous trip! I graduated as an engineer and went to work for Boeing in Seattle. I graduated at the University of Illinois as a civil engineer. I got involved in the Minuteman program and I was involved in changes to the sites and many of those changes involved the underground launcher, launch control buildings, as well as the launch control centers. After two and one-half years in Seattle I had an opportunity to go to a field job at Hill Air Force Base, and install training facilities there for the Air Force. I decided that the half-life of an engineer in the aerospace industry was probably about three years and I was coming up onto that anniversary, so I started looking for other opportunities. I saw an advertisement for a mining engineer in Green River, Wyoming. I had done a number of interviews at different places, but they said civil engineers were acceptable. I ended up going and interviewing there at the end of my stint at Hill Air Force Base; I was living in Ogden. I took a job with Stauffer Chemical Company in Green River, Wyoming as a mining engineer. It was a trona mine. Trona is a sodium sesquicarbonate. They make soda ash out of the mineral [which is] used in glass manufacturing. So I kind of grew up in my career at Stauffer out of Green River, Wyoming.

LB: Was working in the mining industry a family tradition?

GZ: No. The first mine I ever saw in my life was the one I went to work in.

LB: So it was your training as a civil engineer that, through a circuitous route, led you to work in the mining industry.

GZ: An awful lot of what happens in the mining industry, and what a mining engineer is trained to do, has a lot of background with civil [engineering]. I graduated with two options, a structural option as well as a highways option. So I had some background in things that we used in the mining industry. It worked out real fine. I may have not been as successful as an engineer as you might think because I didn't stay there very long. They promoted me and got me out of that. First they promoted me to Chief Engineer and then I did some lobbying on their behalf at the state legislature when I was Chief Engineer, and I was promoted to Maintenance Superintendent and then to Mine Superintendent while I was at Stauffer.

LB: What's the job of a mine superintendent?

GZ: It's basically a management type of position that structures the organization to mine efficiently. In that position I had the maintenance responsibilities as well as the mining and the engineering responsibilities under me. You had to design the mine, set goals and objectives that would fit the amount of ore that you needed to [produce], and supervise the staff. I had many supervisors and foremen that reported to me. The foremen usually went through a supervisory chain of command, and then we had the miners. That happened to be a union-free operation. We had quite an exciting workforce. They were very productive. We ran the most productive operation in the trona patch; there were several other mining operations there at the time.

LB: How did you end up in Utah?

GZ: I ended up in Utah because I had the opportunity to take people on tours of our mining operation [Stauffer Chemical's trona mine]. I used to tell people, "If you want to go underground, don't be too concerned about it because our mine was like going into the basement of Macy's Department Store." It was all lit up and we had concrete floors down around the shop, we had a warehouse underground, we had offices there. We used Cushman scooters to get around, like you do on the golf course. They are very quiet and our roadways were very dust-free and lighted all the way out to the mining sections. So it was a very comfortable place to be. I was asked to [lead] a tour with some folks with Coastal Corporation and the people who came on the tour were their Mine Superintendent, the Vice President and General Manager of the Southern Utah Fuel Company operation out of Salina [Utah], and their Senior Vice President out of Houston [Texas]. So I showed them all the things that we were doing. I had the opportunity while I was with Stauffer to visit lots of mines. I told them, "I'm not a mining engineer and don't have a mining background, and I need to learn." They [Stauffer] said, "Just go do it," so I did. I traveled to Canada and all over the US. I've been in coal mines as well as other mines to learn how other people did it. So I spent my time on that [Coastal Corporation] tour showing them why their coal mining operation was really substandard! I showed them all the neat things we were doing. Well, it wasn't but a couple of weeks later that I got a couple of calls and they wanted me to come to work for them [Coastal]. Well, I didn't want to ever work in a lousy coal mine! I had all kinds of reasons that I didn't like the coal mining industry at that time, but I did go on an interview with them. They were insistent and six months later I accepted the job. So I went to Salina, Utah and became the mine superintendent at the underground coal mine that was growing; it was quite an exciting time. They were doing things that the other coal mines in Utah weren't doing at the time. I had good reasons to leave Stauffer--we had a management crew that had taken over the division, they made a division out of it and their headquarters were in San

Francisco, [and] they decided they knew more about mining than we did, so that wasn't too fun. It was a good opportunity for me to look for a different place.

LB: Do you remember what year this was?

GZ: 1977.

LB: And do you remember the name of the mine at Salina?

GZ: The mine was Southern Utah Fuel Company. It's the Convulsion Canyon mine. It's still there, the most productive and largest mine in the State of Utah today.

LB: Is that the mine they call by the acronym SUFCO?

GZ: Yes.

LB: When you were in that position at SUFCO, was that a union mine?

GZ: It was union-free, still is. It is a different company now; Arch Minerals I believe owns the mine now.

LB: What was your job as the superintendent?

GZ: Well, I actually took a demotion because I was directly over the mining operations only, maintenance I did not have, did not have engineering at the time. With the way the operation was growing I thought that was a neat challenge. So I was directly over the mining operation itself, as well as the outside tippie operations, which is the coal loading and transporting operations. I had that under me, too. But I wasn't there very long. In 1979 they promoted me to Vice President and General Manager of Operations. That's when the vice president and general manager was Vernal Mortensen; he had taken on a position to develop a new property, the Skyline property by Scofield [Utah]. So he had a group that had offices in Midvale [Utah] to do all the permitting and design work for the new mine operation. He took over that and I still reported to him. He is an interesting man. The mine was a family operation; the Mortensen family owned the leases and mine. As they tried to grow they needed more capital and that's when they sold the operation to Coastal Corporation. Coastal kept Vernal on as their Vice President and General Manager and I replaced him when he moved up to Salt Lake.

LB: What would a typical workday be like for you at that time?

GZ: I had a company vehicle, a truck, so I would arrive at the mine usually before the supervisors; they all came in vans. We bussed our employees to the mine, provided transportation for all of our employees. The supervisors and foremen arrived slightly before the miners. The miners were paid portal-to-portal so they were paid at the time they entered the mine to the time they came out. That was an 8-hour period. They got paid for lunchtime. We had three shifts to cover the 24-hour mining time that we did. At that time our mining operations went Monday through Friday. We had maintenance operations and other things going on during

the weekend. Typically I would be at the mine for at least 10 hours. My normal day was 30 minutes or so to the mine. My normal day would be an 11 or 12-hour day. A short day would be a 10-hour day. I spent many shifts at the mine, overnight. The best part of my job was getting down in the mine and talking to the miners, making sure we had the support we needed. As I told them, and all of my supervisors, "The best thing I can do for you is get you the tools you need and help you get your job done." We accomplished some neat things. We grew the mine very rapidly. The first million tons a year came out while I was there. Of course, it's ramped up now, that mine's in the 6-7 million tons a year [range].

LB: This was the new mine at Scofield, is that right?

GZ: Skyline was new, but I'm still talking about SUFCO. Skyline was going to be a new mine. The design and stuff was being done while I was still at SUFCO.

LB: My reason for asking that is [I'm] wondering if the resources you needed at SUFCO were getting siphoned off as Skyline was gearing up.

GZ: No, we siphoned them off later! The resources were basically people resources. We had good people and when I went to Skyline I was the first employee on the payroll for the Skyline Mine. It was called Utah Fuel Company at the time. After the permits got issued and the designs were complete enough that we could start mining operations, we had already started surface construction up there, I went to Skyline in 1981 as Vice President and General Manager of the Skyline Mine. I had the opportunity to build the mine from the portal in. It was a unique and very neat experience.

LB: At this time, what were the regulations like that you had to work with? The federal or state regulations.

GZ: The federal regulations for coal mines were different than for metal and non-metal mines, and this was one of the reasons that I didn't want to go into coal mining, but that changed. There were several regulations you had to follow. The federal regulations for health and safety were administered by MSHA-- the Mine Safety and Health Administration. The environmental regulations were regulated by DOGM from the state [Utah], and the mineral estate was regulated through the Mineral Management Service, which is now a part of the BLM. The old USGS [U.S. Geological Survey] Mineral Management Service was the one that had the mineral estate. Those were the primary regulators we had to deal with. Of course, we were on Forest Service ground so we had to also deal with the Forest for surface issues. There were some unique things that happened at the mine because of all of those integrated management agencies that had to oversee our operation. That ceased to be fun by the time we got into the 1990s. You just had too much oversight and a lot of time it was conflicting. The agencies wouldn't agree and you were trying to please everybody, and you couldn't please everybody. You could please one at a time! I had a very unique time in my career that we could make things happen, we could get people to agree, and we had excellent safety record, excellent environmental record. We got a number of awards at the mine for outstanding actions that we took. I think today it would be much more difficult.

LB: What about the politics? You had mentioned that when you were in Wyoming you did a little bit of lobbying or presentations for the legislature. What about in your position in Utah? Did you get involved in any of that?

GZ: Well, yes, I was involved. The coal operators had a Utah Coal Association and today I believe the mining association includes all the mines. At that time, coal operators still met separately and I was involved with the coal operators. I was chair of the Safety Committee for a while and I participated there. So if there were issues, we needed to meet with state folks whether it be the legislature or any of the agencies; a lot of the time I'd be involved in some of that. I got quite involved later in my career. I was appointed to an advisory committee by the Secretary of Labor. I spent some time in Washington, DC regarding diesel equipment used in underground mines. I was the chair of the National Coal Association's safety committee on developing proposals and comments on proposed legislation. I was involved throughout my career working on legislative and agency issues.

LB: If you could look back at your time with the Utah mines, what might be two or three key issues that you felt you dealt with at that time?

GZ: Are you talking about politically or are you talking about the issues about actually achieving mining goals?

LB: Let's start with the political at this point.

GZ: I don't think I ever had any key issues politically, other than the safety issues, that I really dealt with. There's always been a question in Utah about severance tax for coal. I did some certification, recertification and training of teachers, I was asked to do that. Where they would have to get a certain amount of credit, and I did that by giving some history on the coal operations in the State of Utah and how they worked. And severance tax always came up in those courses. As close as I got to ever really doing any lobbying or work on that particular issue was doing some reviewing of how we would deal with severance tax in the State of Utah. I did that through presentations with local groups like chambers of commerce and schools that wanted the talk. That was just a subject that came up, so I just showed them that if you put a tax on it, it goes right into the bottom line of what we sell the coal for. Every time you add an operating cost on, which this would be, if you want to maintain a profit margin there's a percentage there and it costs the consumer more than the state's going to get. It is a great tax if you're in the State of Wyoming because you export most of it. Most of that tax goes to people outside that state. In Utah it isn't that great a tax because a lot of the coal, at that time, was consumed in the State of Utah. We do export quite a bit of it now, but it depends on whom you want to pay the tax. The consumer is the person who always ends up paying the tax.

LB: Why was it called the severance tax?

GZ: It's called a severance tax because when you sever the coal from the ground it's on a per-ton basis. You record every ton and you have to report every ton that you take out underground; you do measurements underground, volumetric measurements, to calculate the tonnage that comes out. That's checked by the Mineral Management Service and they make sure you're paying the

right amount of royalties. We already pay royalties and the state gets a good share of that money back, but the royalties go to the federal government, there's a portion that comes back to the state, that's about an 8% tax to start with. That's a pretty good tax. Then the severance tax would have been a state tax, it would stay within the state; we still do not have a severance tax in the State of Utah. We're all underground [coal mines in Utah]; it's difficult for the underground operations to compete with the big surface mines in Wyoming. If there's a severance tax added on, there would be a good income to the State of Utah but the question is where do you want that tax to end up? It's a benefit for the state, it may be something that should be considered, but my position was always: You can balance your budget, [but] you don't have control of tonnage that's going out of the state, and that varies, and when you start to rely on a tax base that you don't have control on you start to have problems. Especially if your citizens are the ones that end up paying the tax.

LB: Again within the political perspective, what was the most memorable regulatory change that you saw while you worked in the Utah mining industry? And what effect did it have?

GZ: I think the most memorable regulatory change probably didn't affect us, but it was when the federal government passed the mining act to change the role of safety enforcement in non-coal mines. That affected all of the hard rock mines and all of the other mining operations, such as gypsum and limestone mines, et cetera. They went to the same system that was in the coal [mines], and I had many objections. That was one of the reasons that I didn't want to go into coal. The way the federal law works through MSHA is a very punitive sort of law. It does not allow for good, progressive change; it doesn't allow for good innovation in mining. It doesn't allow people who really want to make strides to make the [mine safe]. It just punishes you for everything that you may or may not do that is against the rules. If you don't have the toilet paper in the portable toilet, you get a fine; it is automatic, it's required. Whether the fellow forgot it or you ran out, it has nothing to do with really long-term safety of the miner. It is punitive in that requires the inspector to automatically write a citation, and then the fines are all determined later, two or three months later, through administrative law judges. They have no idea what the situations were, they just see the [report]. Then you got somebody else beside yourself that doesn't know what the situation is, going in and negotiating the settlement. The metal/non-metal mining was under a law, enforced by MESA under the Dept. of Interior, and that law had mandatory standards. If you didn't comply with those you'd get a citation, and if you were doing something that was any kind of imminent danger the only thing they could do, they couldn't write you this real nasty deal [report] that would get decided months later, they [did] the only thing that made sense: they shut your operation down. They always had that hammer. When they shut the operation down, you really paid attention. All the rest of the regulations were advisory: "We think you ought to do this, and we can write you a citation on it. If you keep doing this and we think it's a safety hazard, we'll write you one of the mandatory one." So there are an awful lot of times that you went underground with an inspector and [he said] "You know, I think you ought to do this a little differently because this is what we recommend." You'd sit and talk about it and you'd come up with a solution, and it may be a better solution than what the recommended standard was. There was a lot of cooperation between the inspectors and the mining operator to try to make a better operation. That all went away under MSHA. It was here comes the enforcer. I had a very difficult time trying to keep all of my people that were dealing with them upbeat and say, "They're here to help. Every regulation is written in blood so we're

going to make sure that we don't have any blood on our hands. We're going to comply with everything, and that's just the way it is." But it was such a punitive system that you got a very adversarial relationship most of the time. That was not productive. We were able to have, probably, if not the safest then one of the safest [mines]. We were the safest for many years. On average we were probably one of the very safest operations that ever existed in the State of Utah.

LB: Looking at your experience at the mines from the mining standpoint, do you think that the regulations accomplished what they needed to accomplish? If they were addressing safety issues, were safety issues really present and were the resolutions making the place safer, as an example?

GZ: Well, yes. I had to be reminded by the director out of Washington. The director of the Mine Safety and Health Administration, got me aside one day when I was on the diesel committee and I was on a rant about what they were proposing wasn't going to make anything any better. In fact they were going to make them worse. He got me aside and he says, "Glen, we're not talking about your operation. We're talking about the guys that refuse to pay attention. That's why we write the regulations. We write the regulations so the guys that don't listen and don't have a good safety program, we have a way to enforce a regulation to make them comply. And you're complying already and you're just arguing because you want to do all these other things, and this kind of restricts you." I said, "That's right. So let's figure out how we don't restrict me so I can do some things better and still have the regulation you want that takes care of the bad operators." I think he had a very good point, that I wasn't paying a lot of attention to in my career. I was trying to get them to back off so we could do some more innovative things. Yes, the regulations are written for the bad guys and yes, I think in the long run they have made significant strides and improvements in the workplace and in safety in our mining industry. You can see that just by comparing us to the other countries. You compare us to China and there's no comparison. Compare us to the Europeans; we're still head and shoulders above them in underground operations as far as safety goes. I'd have to say, "Yes, the regulations have made the workplace safer." Our environmental regulations have done an amazing job of preserving and reconditioning the environment and putting it back into as good or better condition, a lot of times, than it was when we started our mining. And that's all been recent, that's all been since the 1970s when we made the big change in both health and safety and environmental regulations. Yes it has, but also for an operator that wants to do something above and beyond and perform in a way that they're proud of their operation, and they're contributing something to the environment in a very positive way, a lot of times the regulations get in the way.

LB: Give me a couple of examples of how you felt like you were constrained from moving your operation forward to more efficient.

GZ: I'll give you one that I think is obvious, roof control. MSHA and the coal mining industry grew up with certain ideas that they learned over time, at what improves roof control. We were roof bolted, a way of putting steel bolts in the roof, tensioning them or cementing, grouting, them so that you made a beam out of layers of rock in the roof. It secured the roof and the roof didn't fall down around your ears. MSHA had learned over the years that these things worked. But there are some innovative ways that do a whole heck of a lot better job. Truss bolting had been proven in places that were caving. By taking out all the material and putting tremendous weight

on the buttresses or the pillars of the mine, they could hold up the roof with so much more fracturing safely than you could with the standard roof bolts. To get them to even consider that! You had to have them [MSHA] approve your roof control plan. I couldn't even get them to do it in an experimental area where we didn't expose people. It was because the regulation was this and that's what we've always done and that's what you're going to do tomorrow. So you had these restrictions that didn't allow, the law didn't talk about the things that you could do to improve your workspace. Roof control, for me, was one; I wanted to do some remote mining and stuff where we could go in with just the machinery and not secure the roof, but do it later when you could do it more efficiently. It's going to have to be so close to the face no matter what, so close to the actual mining activity.

A lot of times it's due to the personnel involved and having said that, there are things that we did in the mines that we were able to keep pushing and going beyond the local regulators that were out of Denver. Getting some things done [where] we had to go as high as Washington, DC. That's where I got involved in maybe some of this regulatory lobbying type of stuff. Diesel equipment underground was the same way. The union opposed diesel equipment underground for reasons that John L. Lewis established back when he was kingpin in the UMWA [United Mine Workers of America]. He didn't want diesel equipment anywhere because it was competing with his coal. Coal was used to run all the locomotives running across the country, and as they started to dieselize the locomotives, he put out an edict: There will be no diesels in our mines. That held over in the era that I was involved [in and] it became a health issue: The union didn't want diesel underground because of emissions. We understand the health issues and understand them very well. We don't want to cause health problems, but let's figure out how to do that and still allow the option to use various types of equipment underground, including diesel. Diesel has been used for years and years underground in the metal and non-metal [mines] and we had used it in the non-union mines. And we did pulmonary tests on our miners, we did all kinds of studies and as long as they didn't smoke, because they couldn't underground in coal, they ended up healthier than their counterparts, even though they had diesel underground. It was interesting times. There're diesel powered electrical systems in submarines, they collect all the diesel exhaust and recycle it.

LB: I was going to ask you if the diesel equipment was scrubbed?

GZ: Yes. Scrubbed and there were all kinds of ways to limit diesel emissions. I think the one that is most problematic is the particulate that comes out of diesel emissions. The scrubbers take care of that. You have the normal other things you worry about, the carbon monoxide out of the exhaust. We used precombustion chambered type engines that are very efficient and have very low carbon monoxide levels if you have a converter on it; you'll convert everything to CO₂. You can deal with the health issues from the exhaust very easily. Two milligrams per cubic meter of five micron of greater dust is the regulation for airborne particulate in a coal mine. Well, diesel particulate is measured just like coal dust is measured. So it didn't make any difference where the particulate was coming from, you're measuring it. You had individual dosimeters that measure that particulate. As long as you could stay well below that, you didn't have a pulmonary problem. That's less [particulate] level than in many urban canyons, by the way. So you go running around in a Salt Lake inversion you're getting a higher dose of particulate than you are in a coal mine.

LB: What other kinds of safety issues did you deal with? What did you do with the coal dust, for example?

GZ: In order to keep the coal dust from coming in your breathing atmosphere you removed it or kept it out of the breathing atmosphere. You did it where you drilled or had miners cutting the coal, you used a fog-type high pressure spray that just encapsulated the whole area that you're cutting. The dust didn't escape that. If you used exhaust ventilation, which most of those mines used; there are several types of ventilation you can use. You can run tubing to a fan that pulls the air in and runs it to the fan that is located in the return airways, where you don't have people working or activity. The fresh air comes in behind you and goes up and is sucked through the tubing and goes out into the returns, and keeps that dust out. You have some operations that are much more difficult to contain. They're probably not as dangerous, like rock dusting where you're applying limestone dust on the coal mine walls, floors and ceilings to keep the explosive character of the coal dust abated so that you don't get an explosive atmosphere. And you blow that dust on, or throw it on. In those cases those folks need to wear respirators. We used a lot of air helmets, that's kind of a unique type thing. You had a hardhat, which was the helmet, and it sucked air through a filter system and blew it out over the front of your face, so you had an air curtain in front of you and you didn't get any dust in where you're breathing. But the primary way to make sure that's all working is you put a dosimeter on your miners. We were required [by MSHA] to do so many and the little cartridge that collects the dust you breathed over an 8-hour period was sealed. It had to go into an independent lab to be tested and those reports went to MSHA. They knew how much your miners were exposed to. We did a lot more testing than MSHA did on our miners to make sure that we weren't going to get a problem with it. So you had these you could weigh and those dosimeters would be in your breathing zone, they'd clip on right here [gestures]. You'd have a dosimeter that had a little pump on it, had a battery pack that you wear on your belt and it would pull air in and simulate the amount of air a person would breath during his normal breathing cycle through an 8-hour shift. That's how you knew how much dust that the miners were exposed to.

LB: Why was your company so willing to do more than what MSHA wanted?

GZ: I would say there were several reasons. One is my company didn't tell me as the mining manager that I had to do more, or that I had to just meet the law. They said, "We expect you to have a good operation and we expect you to meet your goals with the tonnage that you're supposed to. The costs were very important, and we expect you to run a good operation." The people we hired to run the operation, we had a fantastic safety manager of our safety program; his name was Ben Bringhurst and he just lived and breathed doing it better than anybody else. He had all of our support. I didn't want to go underground and breathe bad dust or bad fumes and I spent quite a bit of time underground, and neither did anybody else that worked there. So we all had those same goals in our mind. This is what it takes to have a healthy place, so let's make sure it works. Same thing with safety. Every single employee that came to work for us took a week of orientation and training before they started entry-level jobs. I spent probably an hour, sometimes 30 minutes to an hour, with every employee that came on board and one of the things that I had to beat in their minds, so I knew they understood it, I just said, "You tell me what's going to get you hurt underground," and they would think "Maybe if I don't follow the rules." I said, "I'm going to tell you right now, nobody in this operation can overrule your

decision not to do something because you feel it's unsafe. I'll give you that authority right now. The foreman can't tell you that, your supervisor can't tell you that, you're going to be the sole determination of whether your job and what you're asked to do puts you in jeopardy. You will get training on every job and it's there to make you safe, and if you ever have a question you just refuse to do the work. We'll sit down and we'll figure it out. Nobody's going to make you do that work because if they do, they're not going to work here anymore." That was my lecture to every employee that came to work for us. They believed it and there were many times they said, "No, I'm not going to do it." It worked out really well for us.

LB: Do you think that was a common attitude in the coal mining industry?

GZ: Probably not. I don't think it was common, but there are other very good operators that were very concerned about safety. I don't think they all started out that way. I didn't do that on my own. The management team and our safety director all sat in there and asked, "How are we going to get this all going so we've got good control over our attitudes, how we're going to address our jobs, and our employees really believe that they are key to how we work." That came out of that and then it became my job to start with that attitude when we hired the people.

LB: In the past interviews that we've done we've talked to people who've walked into an existing, operating mine, but the Skyline Mine you were starting up.

GZ: Yes.

LB: How do you go about starting up a coal mine?

GZ: You don't hire coal miners! There is some truth to that; we did hire coal miners. We hired people and we hired people with attitudes and values. We had the luxury of hiring 3% of our applicants; 97% didn't make it. We developed a very detailed, in-depth interview process where we interviewed our folks. You can get education and experience off a resume, and a lot of people use that as their main sorting technique. But you have a real tough time getting to personal values, personal beliefs, ideas about what their job is going to mean to them, what kind of career opportunities they want in the future, what kind of dedication they have as a person to their occupation. It didn't make any difference if it was a janitor we were hiring, or whomever, we wanted to know what made them tick and what were their values. People that are proud of who they are and what their efforts in life produce are the people we wanted to hire. So we ended up hiring quite a few degreed people that worked underground as miners because they decided in their career that they wanted to do something different. When I was in the trona mining, as well as in coal mining, we had quite a few women who worked for us. We were one of the first to do that. We were the first in Wyoming to put women underground. I don't know if we were the first in Utah but we had women underground at SUFCO in 1977. We weren't looking for the stereotype; we weren't looking for the guy that had 10 years in the coal mine and knew how to do everything. We were looking for people with values. You can learn to do all kinds of jobs. There are certain jobs you had to have certain kinds of expertise at, electricians had to be certified, we had to have to have supervisors that had their foremen's papers and things. So we did have to hire some certified people, but a lot of those folks we had the opportunity to

bring them out of SUFCO. We had kind of a building block thing, we could get people we wanted with the right attitudes. That's what made our mine.

LB: Tell me a little bit about the planning that goes into opening a new coal mine.

GZ: I can't remember numbers, but it was a few million bucks worth of permitting and planning that went into opening the coal mine. The permits were voluminous, you know. The environmental permits and how the mine site was set up, what you did with the streams that are coming through the site, the removal of the topsoil, the storage of it, the plans even included the restoration of the site after you were done mining. The underground design had to be done, so we had to do a lot of exploratory drilling, core drilling, to find out thicknesses and qualities of the coal to make sure we had a mine laid out that we could get into the coal seams and get to where the coal was and get a good extraction of that resource. The mine design is complex because there are faults, dykes; dykes are igneous intrusions that go through the coal. The coal mine was dipping so we knew the water was always going to run down hill; you had to handle the water that came into the mine. And the coal is cleated so that you have to mine it in the direction so you don't get big slabbing in places where the coal comes off the ribs or walls and becomes dangerous. So there were a lot of things that had to take place in the mine design, as well as on the surface design. It took a team of engineers, you had an engineering staff that did those preliminary designs and they all became part of the permitting process. It took two years to do that before we ever started. At Skyline we had a partner to start with, Getty Oil was our partner; they had 50% ownership and they had a team of engineers also that were looking at what we were doing. We had to have approval from both partners before we could proceed. Coastal bought out Getty's interest and the operation became a little easier to handle without having two owners after they bought Getty out. I don't know if I answered the questions quite the way you asked it.

LB: It was good. I don't know anything about starting up a coal mine. It's all good for me.

GZ: We had the design and permits in place in 1981 when I went to work there. We were in construction of the surface facilities. We had done excavation and we were doing foundation work and stuff. [Took a break in interview]

LB: [Interview resumes] When we left off we were talking about opening the Skyline Mine. You were talking about building the structures on the surface.

GZ: Ok. The construction was underway on the surface. We had a consultant out of Chicago, the Paul Weir Company, and they had developed an overall mine-life plan for us in conjunction with our staff and engineers. It called for a workforce of 900 people to reach a production capacity of 5 million tons a year. The surface facilities were being built to handle that kind of capacity so we built office buildings and everything up front so it was done one time instead of in stages. I was there during the construction. It took two years to do the surface construction and in the second year was when we started mining. We had the surface office building [that] had been constructed and we had places to shower and do all that with the miners, so we started our mining operation. It was a kind of interesting time.

If you remember in 1983, that winter we had the 100-year event, we had the big snows and run off, and Thistle slid. The railroad going to the west was no longer operational, the D&RG [Denver & Rio Grand] that went out to the west. That was where the coal that we were mining [was going], that was where our market was. We stockpiled coal at Soldier Summit during that period of time, but we had roughly a third, a third, and a third, although these aren't the exact numbers. A third of our workforce came from Spanish Fork area and Utah Valley; we were bussing them to the mine. A third of our workforce came from Sanpete County and northern Sevier County, and we bussed them from Fairview to the mine. The rest of them came from Carbon County. Actually, when we started Carbon County had the least percentage; we had more employees from Utah County and Sanpete County. Well, Thistle slid so you couldn't get people from Spanish Fork to the mine anymore, so we bussed them into Fairview and then up the canyon. And then Fairview Canyon slid on Memorial Day, so we lost that access to the mine. That was the majority of our workforce. I lived in Sanpete County. But we didn't stop operating; we kept operating. We bussed everybody to the mine through Salina and up Soldier Summit and back from Fairview; that was a 4-hour trip. From Spanish Fork we bussed them over the top into Duchesne and up Indian Canyon to [come in] by Helper to Hwy 6; that was a 4-hour bus trip one way. So we went to a 4-day work week, and four days happened in three days because our workdays, we changed our workdays to 18-hour days. So we'd work eight, take 10 off to eat and sleep and go back to work. We divided the workforce into two pieces. There was a Monday through Wednesday piece and a Thursday through Saturday piece. We converted the top floors of our office building, it was designed for 900 people, into bunkhouses. We borrowed the cots from the National Guard and they [employees] brought their coolers full of food to last them for the three days they were going to be there. We plugged in a bunch of TVs with VCR tapes so they could watch their movies and go to sleep and get up. They didn't have time to get in trouble and go downtown, because they had 18-hour days. In August when the highway reopened through Thistle and we got Fairview Canyon reopened, we hadn't lost a single employee. We all made it through and it was quite a unique experience. But that was under the development time of the mine, when the mine was first starting up. We were just trying to get our entries in to where we actually get into high production mining. That coal that we stockpiled at Soldier Summit all at once became a valuable commodity because that was at the same time that the Wilberg Mine disaster happened. That coal then went to Utah Power and Light to keep them going. It wasn't planned that way but it ended up that way. We survived that timeframe, and then we got a contract with Intermountain Power. We had the first contract with Intermountain Power to deliver coal to them. Then we were up and running.

LB: Where did you deliver it?

GZ: We had a railroad siding and we did unit trains on the D&RG. The railroad had been opened up by that time. It went to Intermountain Power project over by Delta, that's the big power project over there; IPP is what people call it. They had two large units that they were feeding. They had plans and [were] permitted for four units. If my memory is right I think they are 750-megawatt units with 1500 megawatts of capacity; that's a big power plant. We still have a large contract with Intermountain Power. I shouldn't say "we," it's the company; Skyline Mine still does and so does SUFCO. That's where some of their coal goes. Anyway that's when we got started. From day one we planned on being a long-wall mine so that's what our prime goal was, was to develop into the coal seam so we could panel off areas for long-wall mining. So we

got that going and that brought the production up. When I left the mine in 1993, we were up to five million tons a year. We were the largest coal mine in the western United States when I left.

LB: When you say long-wall mining, what length at the face are you talking?

GZ: Well, it varies. Faces at the time that we started were 550-feet long. That expanded over the years. Some long walls in some of the mines now are a thousand feet or better. But we started at 550 and we expanded to 600-650 or so; I can't remember exactly the lengths that we were mining at that time. They have been getting longer as time progressed. The bigger the panel you can make, the more productive you can be. It takes more time to set it up and more time to recover the equipment, but if you can really block off a big block of coal it really makes the long-wall more effective.

LB: Was it exclusively long-wall? Did you have some continuous miners?

GZ: Yes, we always had continuous miners. You have to have some way to develop your entries to block off your long-wall. It is always kind of a mix-and-match. You have to have enough continuous miner operations to continue to get your development out ahead of your long-wall production so you don't run out of places to put your long-wall. It depends on how productive your continuous miners are, how many units you need to do that. Normally speaking, you'd have a couple continuous miners developing for every long-wall.

LB: Was subsidence an issue?

GZ: Subsidence was an issue. Whether it should have been or not is a good question! We had subsidence. [If] you're going to take out all your coal, you're going to lower the ground. So I remember we had several visits about where we were going to subside and how we're going to subside, and what we're going to mess up by subsiding. I always had a neat tour that I took all of the folks that wanted to come and see all the problems we had with subsidence. I'd take them up on the mountain in a van or something, up on the back roads. We'd get out and we'd walk across a place and over here where we had a good view. I'd say, "Ok, now who saw where we subsided?" Nobody saw anything, of course. "Well, we just walked across a place that is six foot lower now than it was a year ago. You're now standing on a place that hasn't subsided at all." That was the first education about what it looks like on the surface. I said, "Now, come over here and I'll show things you've got to look for. Now this is where the long-wall is and it's moving this way. It takes a little time before you see the ground move, but if you look over there those quakies [Quaking aspen trees] are tilted. You look down a little ways and those quakies are straight up. Well they were tilted to start with, because when it subsides you lay the ground down and they tilt. And when you keep doing it the ground goes back up and they stand back up. Now you can know where the exact curve is happening on the surface. There are a few places I can show you some cracks." We went around and wherever you have a layer of rock, like sandstone, that is close to the surface and doesn't have a lot of soil over it, when that lays down it will break that cap rock and you'll have a crack. As that crack opens up and that curve moves, it closes back up. I said, "It depends on how wet the year is, whatever, whether that soil fills the crack up very quickly or whether you're going to watch it for a while."

We had subsidence. We had a stream, a spawning stream coming out of Electric Lake, Burnout Canyon. We were going to mine underneath it and everybody was worried about the cutthroat trout that ran up that stream. The stream was maybe a foot or so wide, it was a little stream, but the trout would go up it. We'd get maybe a hundred or two, I don't know exactly the count, but we had trout go up there to spawn. The Intermountain Research Station, I think they're part of the Forest Service, came down and did a couple-year study when we did this. In order to mitigate anything that might happen to that stream because we were going to subside it, we put a fish ladder over on an adjacent stream to the west that wasn't going to be subsided. It was off of our coal lease. We opened up a couple miles of good spawning habitat that didn't exist before at Electric Lake for this part of a mile that we were going to subside. We did all the studies during the subsidence, and of course the creek went down and the spawning never stopped. None of the fish knew the difference. We ended up enhancing the spawning capability as we learned about what subsidence was. From our perspective the engineering group pretty well knew that because they're subsiding under the Atlantic Ocean, out of Nova Scotia right now in a coal mine. They knew that we're not breaking to the surface. We had good clay and clay-type layers, mudstones and shales and such, that once you first rubblize underground, breaks 30-40 feet high and the layers start to settle on that. As it consolidates it just lays it down fairly gently and those clay layers self-seal so you don't go to the surface with the cracks. So the hydrology pretty much stays the same. We did have subsidence, you could see it, you could measure it. But it really didn't become a mining issue after we had good experience with it.

LB: Thinking about your time at the Skyline Mine, what stands out in your memory as your proudest achievement?

GZ: I think the proudest achievement I had, personally, at Skyline are the people. We had an excellent workforce. You always have some folks that may not fit, or it isn't their career and they're not happy with where they're at and all that, but overall that was a wonderful bunch of people. My proudest thing is having a group there that was proud of what they did when they went home. They could talk to their neighbors, they could bring their families and we'd take them underground and show them what the work was like. They would brag about it. I was asked once by our corporate president, coal mining president, to tell him what made us so productive and successful. He expected all the technology. Anybody can buy a long-wall, anybody can buy a continuous miner. There are several companies that make them and one might be a little better than the other. But it's the people that make it go. That's my proudest thing, that we were able to put together a unique workforce that worked together and played together. They enjoyed each other.

LB: So they spent off-hours together, too?

GZ: Yes, they did. I still do, I still have friends that I developed that I still see and hunt with and enjoy.

LB: Was the company part of the community where the miners lived? Did they get involved in community activities?

GZ: Very much so. They encouraged us to do that. Personally, when I was in Salina I was on the hospital board, I was involved with the Boy Scout program. Same thing when I moved up to Sanpete, got involved with the community. I was president of the Lions Club up there. So, yes, we were encouraged to do that. A lot of our employees were involved locally. We didn't contribute to the communities directly with money type grants or that sort of thing, but we certainly participated with the community. The local girls camp up there, we took equipment up there, frontend loaders and stuff, and helped them do some construction work. In the local community we would be involved with celebrations. I'd go buy one of the top lambs at Lamb Day in Fountain Green. We were part of the community; our people were I should say, more than the company.

LB: Is there anything else about your time at the Skyline Mine that you want to share with us?

GZ: I would say, if I were to share for archives and the public, the profession of the folks that are involved in mining, no matter whether it's coal mining or other mining, you work closely with close-knit groups. When you're down there on a crew and you're mining for eight hours a day every day of the week, you form a very tight knit team if your job is going well. The people become proud of what they do and everyday is a challenge. It doesn't get to be as routine as some jobs, like a manufacturing job. When you're underground and developing a mine, you're uncovering new ground and there're new things you find all the time. We had dinosaur tracks in the roof, we crossed faults and we'd hit places where water would come in, and so you're always dealing with new types of issues while still trying to maintain the goals you're setting. What I'm trying to say is, when I share that with people who have never been in a mine and don't know anything about mining, there is a camaraderie that takes place in the mine. There is some real pride that goes along with what you do and what you accomplish, especially when you can do it in a safe manner. A mine has a bad reputation about being an unsafe place to work, and there's no doubt about it, it is a high-risk place to work. But the risks can be mitigated and the risks can be managed so you don't put individuals at risk. You learn what they are and you pretty well can make sure those risks don't impact individuals. I'd say it's a good place to work and it was a fun career, and we needed the coal--we still need the coal--and I wish we would have bought ourselves a better bridge than just trying to do away with coal. In my opinion we should have been building a few nuclear power plants in the last decade, and bought the bridge so we could take advantage of the renewables as they come. We're smart enough about nuclear now, safe enough, that we can do it technically and it sure would build a bridge. But we're going to pay for it because the cost of our power is going to go up and that costs our economy. We had the cheapest power in the world in the United States, primarily because we had cheap hydro and cheap coal. That made us one of the most competitive nations. We no longer have that, we're losing it. That affects our ability to compete, affects our ability to keep our standard of living. As far as Skyline goes, it was a good operation and I had a good time there. I'm proud of what we did.

LB: How does your experience at Skyline compare with your experiences elsewhere in the mining industry?

GZ: I guess I was fortunate. In the trona mines we had an excellent mine, had management there that ingrained in me the importance of running a first class safe operation. The first major

job I got in the mine, when I first went in there as an engineer, is "You're going to write the safe work procedures for the miners." I said, "I've never been in a mine before. I don't know anything about it," and they said, "That's why you're going to write it." So I had to go down and live with the miners and it became their document. I just took what they told me and said "This is how we're going to do it safe. You just make sure that you're telling me something that isn't going to get you in trouble or anyone else in trouble." I documented the best way they thought to do their job. That's how I learned about mine safety and that was the general manager at Stauffer who gave me that job. I think it stayed with me for the rest of my career.

LB: Would you spell Stauffer for me?

GZ: S T A U F F E R.

LB: Ok, and the name of the mine?

GZ: The Big Island Mine. It is no longer Stauffer, they've been sold. But Stauffer was a chemical company. It was German brothers, I think, that founded it. They sold and I don't know the name of the current owner. But it is still the Big Island Mine.

LB: You mentioned the mineral.

GZ: It's trona, T R O N A. Trona is the mineral, it is a sodium sesquicarbonate. Sodium carbonate is soda ash and you got a couple molecules of the sodium carbonate and then some hydration attached, plus some impurities. It was laid down in an ancient lake bed, like a salt deposit. As it got concentrated it started precipitating out and formed layers. We mined it much like we do coal. We were using coal equipment and that's one of the reasons that I hopped from trona into coal.

LB: Sounds like the formation process is parallel.

GZ: Similar, yes. Our coal is organic material that kind of got buried and squished the water out of the old peat beds. Yes, it is a similar type of formation because it is in the sedimentary deposit. The way you processed it is you took the ore and crushed it and they ran it through a kiln to drive off the waters of hydration. Drive off the waters of hydration and then you had the sodium carbonate with some impurities. The impurities were basically muds and shales and some organic matter. The trona, I've got some pieces here [and] after we're done I'll show you. It's kind of a brownish color because the organics died and decayed, the salt type of mineral is brown. They would dissolve the sodium carbonate in a hot solution and filter out the muds and the organics; they used activated carbon type filters to get the organics out. Then they would run it through crystallizers where they would drive the water off and crystalize the sodium carbonate. It came out in a white powder that looked like Tide detergent. That's soda ash and the majority of the use of soda ash goes in glass. Glass is a sodium silicate so you get the sodium from the sodium carbonate and the silica from sand [which is silica dioxide]. That's where the two minerals come to make glass.

LB: Did the coal that came out of these two Utah mines require much cleaning?

GZ: We did not clean it.

LB: It basically came off the belt and

GZ: Yes, went right to the power plant. We had no cleaning facilities and that was one of the prime requirements for mining it. To try to keep it as clean as possible. You can contaminate it. Our coal seam was fairly clean. You have ash in all coal but our ash content was less than 10%, usually in the 6% or so range; anyway, less than 10% ash. Some of that would be contamination from outside the seam or from in the seam. Sometimes you get a little layer of shale in the coal seam. Sometimes you'd go through a fault and you have other material there, or through a dyke. We had a way to take construction type rock if we had to mine above the coal seam or below the coal seam, or go through a fault where we had to go through some rock to get back into the coal seam, we could divert that out a chute. We had a waste pit that we wasted that material. It's just like a dump, you know, that you'd fill up. But we didn't have a lot of that. The coal itself went directly to [the power plant], and it got contaminated some. If you get into the floor while you're mining, or the roof while you're mining it, you'd get some rock that went with it. That just went to the customer. But the customer paid on BTUs. The customer paid on the heating value per ton. So the more rock you sent him, the less the heating value and the less you got paid. We had our own incentive system for our miners. We called it a bonus. Monthly they'd get paid and they get paid on production vs. budget, they also got paid on quality. If the quality was better than what the contract required, we gave them a bonus. If it was worse, they got some taken away from them. We paid on safety. If we had a doctor-treated accident it automatically took away from their bonus. There was no added [money] for safety, it was all take away. There is no bonus money in accidents; we'd take away for that. They'd get paid a monthly bonus. Every day we'd chart, we had a big board and we'd chart how we did the day before so everybody knew where they were headed, what kind of bonus they would get that month.

LB: Just to sum up, take a minute to think about this if you want, how would you summarize your career in the Utah coal mines?

GZ: Well, I came to Utah in 1977 as Superintendent at Southern Utah Fuel and I left in 1993 to go east as a Senior Vice President for the company in our eastern operations. During that time, from 1977 to 1993, I had three different positions: I was Superintendent at SUFCO and Vice President and General Manager, and then I went to Skyline as Vice President and General Manager. I had the job to get that mine running and get it up to full production. I have to say it was a fun time in my career, it was an exciting time, and it was a proud time because we did the things we planned on doing. It was something; I never in my wildest dreams thought I would ever be involved in the mining industry to start with. When I got involved I didn't think I would ever be in the coal mining industry, and when I got in the coal mining industry I didn't think I'd ever be building one of the biggest, most productive and safest mines in the world. But it ended up that way and I have no regrets. I think it was a good part of my life.