



Atlanta Geological Society Newsletter

The February AGS pizza social starts at 6:30 pm and the meeting starts at 7:00 pm

This Month's Atlanta Geological Society Speaker

“THE LIFE OF A GEOLOGIST”

Speaker Charles Livingston Bio:

Charles has had 45 years of experience performing and managing engineering geology, economic geology, geotechnical, and environmental projects throughout the United States, Canada and the Bahamas. This work includes the following: geologic / geotechnical investigations for civil projects ranging from subdivisions to skyscrapers to roads, bridges and industrial facilities; material investigations for construction aggregate; coal and industrial minerals including fullers earth, kaolin, heavy minerals and gilsonite; geologic investigations for nuclear power plants, water-supply dams and various hydroelectric facilities including dams, tunnels, power plants and pipelines; the inspection (a safety evaluation) of major dams throughout the western United States for a U.S. Government Agency; offshore investigations; solid waste studies; contaminant delineation; remediation design; construction / remediation supervision; and expert witness testimony in court cases involving geologic matters.

Geologist or Policeman?

“When supervising the construction of dams (and various other structures) it is necessary to ensure that the work is performed in accordance with the plans and specifications, and that unforeseen conditions or special circumstances are recognized and dealt with in accordance with accepted geologic and geotechnical principles. Field personnel charged with this responsibility represent their employers and the client, and are expected to produce a structure that meets all requirements and is safe. When things are going as they should be, you feel like a geologist. When the contractor elects to cut corners (to make a buck) and you have to come down on him, you feel more like a policeman. It is important to remember that you are not there to win friends and influence people, but to ensure that construction is performed as was intended. Having the best design in the world doesn't mean a thing if construction control is not comprehensive and exacting.”

“Back in the late 1960's or early 1970's (I don't remember the exact year) I was involved in a dam project in the southeastern portion of the United States. This was an industrial site where it was required that a dam be constructed to enable the treatment of process-water prior to the discharge of such water into the environment. It was to be an earthen dam on the order of 60 to 70 feet high from creek level and about 700 to 800 feet in length. We drilled a sufficient number of exploratory borings, excavated test pits, and performed appropriate laboratory testing on the samples. Based upon the geologic and geotechnical parameters obtained from this work (and hydrologic data pertinent to the area), we designed the dam and produced the necessary drawings and specifications.”

“Ultimately, the client selected a firm to build the dam. At that time, I had another project to go to, but the firm that I was working for wanted me to first supervise the initial phase of dam construction relative to foundation preparation. The primary objective of this work was to ensure that all loose, surficial materials were removed and that the abutment slopes were even and did not have overhangs that could preclude proper bonding of embankment materials with the in-place foundation materials. The secondary objective was to supervise creek diversion activities. Work was started on the left abutment first so that, once the surficial materials had been removed, a trench could be excavated through the lower portion of the abutment in which a four-foot-diameter pipe would be installed to serve as a diversion for the creek that flowed through the right side of the valley. Once the creek had been diverted to flow through the pipe, the valley bottom where the creek had been could be mucked out and readied for dam construction.”

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“I didn’t have any problems (to speak of) with personnel of the firm constructing the dam when it came to removing the surficial materials in the dam foundation area. If I said that a little more needed to be taken out here or there, they generally complied without much of a hassle. When it came to backfilling around the diversion pipe, however, they showed their ilk. The diversion pipe was to be a permanent installation through the dam. I honestly don’t remember whether or not it was to later be blocked off on the upstream side of the dam, or (with a riser) was to be used as part of an overflow scheme. The pipe was fitted with seepage collars approximately every forty feet, and the only way to compact the soil around the pipe was to use what I call whackers or plate tampers. Once you get up to the top of the pipe (and a little bit above) you can use heavy equipment, including scrapers (sometimes called pans), sheepsfoot rollers, etc.”

“I had run Proctor Compaction Tests on each of the four or five soil types that would be used for backfill, and we were using a nuclear device for actual testing of the backfill. Now, everyone that has been around this business for any length of time, knows that when compacting soil, a general rule of thumb (and a requirement in specifications) is that it is necessary to have a final compacted thickness of not more than about six inches for any one layer that is placed. Otherwise, compaction will be inadequate. The firm with the contract to construct the dam was a relatively large union outfit, and I can’t believe they didn’t know how it was to be done. They, apparently, had been used to doing some things their own way on other projects, and had somehow got away with it. From the very start (when backfilling around the diversion pipe) they were shoveling in two and three feet of soil and then trying to compact it. I told them immediately that they couldn’t do this, and they acted like I wasn’t even there. I didn’t even need to test it to know that it wasn’t going to meet the compaction requirements, but I tested it anyway and it failed, big time. Since they wouldn’t talk to me, I went to their boss and got the same reaction from him. I kept doing this, moving higher in the hierarchy, until I got to the top dog, the job superintendent. All of them acted like I was in the wrong, and they essentially told me that this (what they were doing) was the way that it was going to be.”

“I am a pretty easy-going guy, but by the time I got back down to where the backfilling operation was going on I was so mad that I had smoke coming out of my ears. One guy was shoveling even more soil in against the pipe. I knocked the shovel out of his hands and I then grabbed his left wrist with my left hand, grabbed the upper part of his arm with my right hand and threw him as hard and I could. He rolled twelve to fifteen feet down a small slope. I grabbed his shovel and started tearing out the excess soil that had been placed against the pipe.”

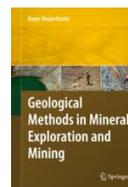
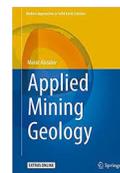
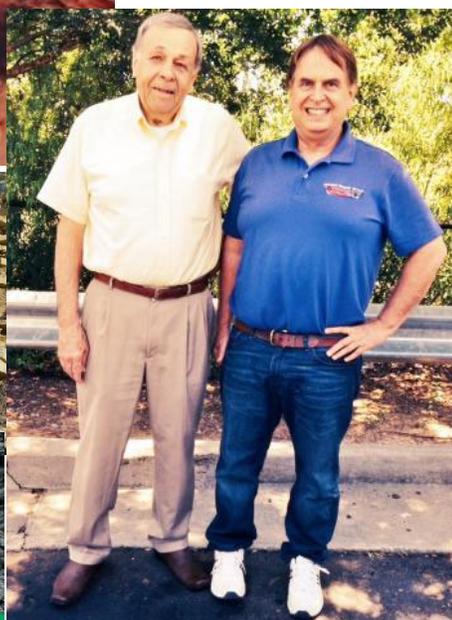
“Naturally, the guy that I had thrown to the ground didn’t like it very much. He went to his boss and his boss went to his boss, and it worked all the way up to the job superintendent. He shut the job down and called a job meeting. I was informed that I was to be present at the meeting. The handwriting was on the wall. I knew what was going to happen at the job meeting, and I was ready for them. I had finally got their attention, and was actually looking forward to the meeting. As expected, when the meeting started, the job superintendent berated me and went through all kinds of wild gyrations at the top of his voice. When he finished, I then calmly pulled out copies of the specifications for the job and their contract with the client, and showed them what they agreed to when they signed the contract. Well, I had them, and they knew it. It was suddenly very quiet. They didn’t say anything, but it was obvious that they were seething.”

“The meeting was over, however, I stayed and talked to the job superintendent for awhile, making doubly sure that we had a firm understanding of how the job was going to be run. By the time I got back to the site where backfilling of the diversion pipe had been going on, the workers (who had been at the job meeting) were removing the excess soil that had been placed. They were now resolved to proceeding in accordance with the specifications, but they didn’t like it. Obviously, I was not the most popular person on the job, but sometimes you just have to do what you have to do. I thought about it while we were working during the rest of the afternoon, and could picture four or five of these guys jumping me somewhere as I left the jobsite. When we finally knocked off for the day, I went to a hardware store in town and purchased an axe handle. I put it under the front seat of my pickup, with the thought that if they ever jumped me I would make at least two or three of them wish they had never been born. As it turned out, I didn’t ever have to use the axe handle, but I was ready if I did.”

“I stayed on the project until backfill of the diversion pipe was complete, the valley where the stream had been was mucked out, and all other foundation preparation was complete. At that point I had to leave and start geologic investigations at a nuclear power plant site in the northeast. Someone else was brought in to supervise the project from that point on. I’m not saying that what I did in this situation (getting physical) is what should have been done, or that anyone else should do something like this in a similar situation. My thought at the time, was that the client had hired us to ensure that the dam was constructed in accordance with the plans and specifications, not to bellyache about everyone not playing fair. I could have called the top brass at the firm I worked for and had them call the client and the higher-ups at the construction firm for a meeting. It is likely that by the time everyone flew to the site or somewhere else for a meeting, and resolved the conflict, a couple of days would have passed. I took care of the whole thing in just a little over an hour.”

“I became very involved in other projects and never made it back to the site of the subject dam, but I did hear reports of construction progress over time. Apparently, there were no other major conflicts between the representative of the firm I worked for and the firm that was constructing the dam, and the dam was successfully completed. There was, however, one incident (not involving the firm I worked for) that is worth noting. The dam was designed to have a sand filter (about three feet thick) that extended vertically through the center of the dam from the top of the dam down to about ground level and then horizontally to the downstream face of the dam. The purpose of this filter was to intercept any seepage through the dam, to prevent piping and potential dam failure. The sand that was used for the filter came from a source some 35 to 40 miles north of the site of the dam. The firm that was constructing the dam hired local truckers to haul the sand. These were typically people who owned one truck and drove it themselves. This was their life, and is it was what they did for a living. Since it was a union job, they were told that they needed to hire (union) teamsters to drive their trucks. There was no way that they could comply with this and make any money, so they refused, and drove the trucks themselves. I was told that one day there were five or six of these trucks lined up outside a restaurant where the drivers were eating lunch, and some union goonies came by and sprayed the trucks with bullets from automatic weapons.”

“These are some of the things that go on behind the scenes that you almost never hear about. When looking at a completed project, most people couldn’t imagine some of the things that happened during construction, or the effort it took to make it all come together.”



What does a Geologist do?