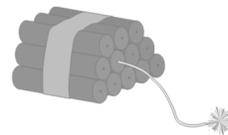


The Primer



Newsletter of the Golden West Chapter, International Society of Explosives Engineers
430 32nd Street, Suite 100, Newport Beach, CA 92663

Volume 31

Spring 2020

Issue 1

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President's Message...

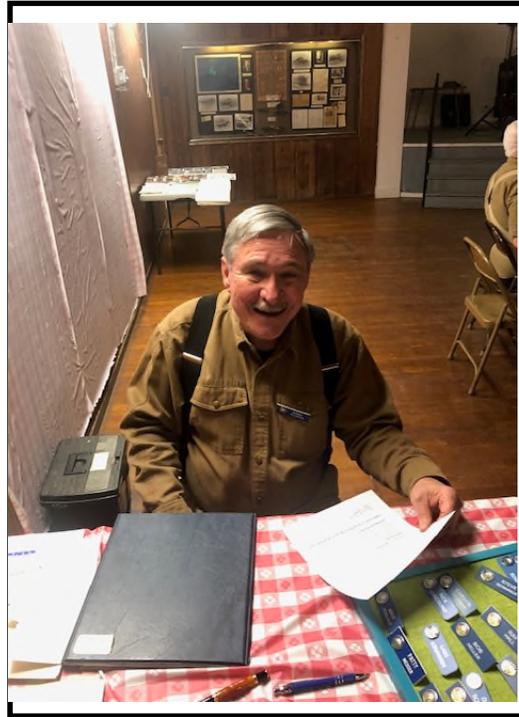
Hey Members, Guests & Supporters

Last year around this time we were surviving a deluge of storm systems thru early spring. This year, we haven't had a drop of rain since January. What gives? Well, at least this early spring weather provided us with a beautiful day and evening to hold our 2019 annual business meeting at the historical Mt. Pleasant Hall outside Lincoln, CA. It was unusually warm in the usually freezing hall which kept me from leaving the loud propane heaters running throughout the program. We had a great turnout to what has become not only a business meeting but, a crab and tri tip feed with all the side dishes prepared by our current board member, past president and newsletter editor, Mike Burneson. Unfortunately, his wife Sue couldn't make the trip (Class Reunion) and we missed her dearly. Mike was able to put together a fantastic crew to give him a hand in the kitchen. Kevin and Donna Lopez, Ladd & Maggie Stephenson, Barbara Drake and Donna Chiurato. Barbara & Donna sold raffle tickets for the very popular prize raffle which supports our scholarship fund and Barbara provided the table decorations that were given away at the close of the meeting. Once again Paul Drake provided music and the sound system. Our Secretary, Joe Stack & Treasurer Jerry Fulghum kept busy receiving dinner & membership renewal dues and Joe's son Robert handed out prizes to the lucky winners. Thanks to the continued support from the following sponsors. Alpha Explosives- Lars Johansen & Gerald Hackler and staff. They recruited eight new members and brought them up from Southern CA to attend the meeting. .

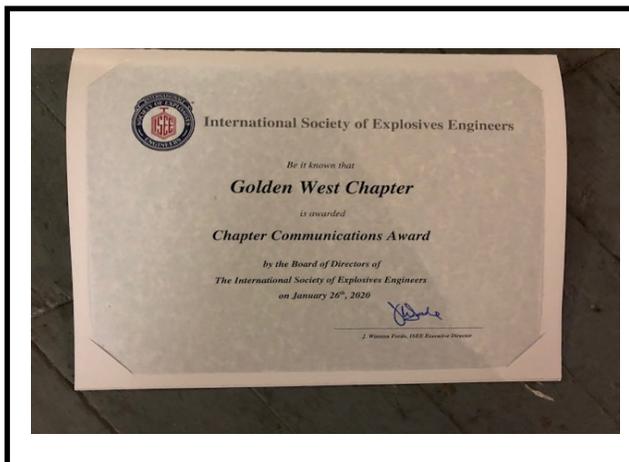
Continued on next page.

The Primer

President's Message Continued...



Upper left photo from left to right is Golden West Chapter Secretary Joe Stack and Chapter President Mike Chiurato. Upper right is Golden West Chapter Treasure Jerry Fulghum. In the photos below are the Chapter Quality Operations' Award and the Chapter Communications Award presented to the chapter at the International Conference.



President's Message Continued...

Austin Powder -Todd Harris; Dave Kringle -Neil's Controlled Blasting; Eric Bennett & the EROCK crew and Jim and Susan Syar of Syar Industries & their guests and webmaster Wes Bender for his work and guidance as we lead this chapter. Special guests were scholarship winner Cody Mallmann and his Mom Paula. A big thanks to our guest speakers Eric Bennett, Don Robinson and Ladd Stephenson. Also, thank you to all of you that helped us put on this meeting and staying a little late to help break down the tables, chairs and hall cleanup. Please see Mike Burneson's editor notes for the details of the business meeting and some special awards from the ISEE. My wife Donna and I attended the ISEE's 46th annual Conference on Explosives & Blasting techniques in Denver the week of January 26th, 2020. There were more than 1,600 people from around the world attending this year's conference. My first task was to attend the Sunday morning Chapter Management breakfast & Workshop. Included in the workshop was guest speaker Bill O'Brian of the BATF. Mr. O'Brian gave updates to some the issues involved with a back log of background checks. He stated it was primarily due to the FBI making gun owners a top priority for those checks. They have recently caught up and the back log is cleared. Mr. O'Brian also stated that reported thefts were down from a high of 50 in 2017 to a low of 6 in 2019. He congratulated the attendees for a job well done. He warned that the industry should be mindful that most of the reported thefts were those shipments that were unsecured during transport and fell out of the back of vehicles. I did purchase a flash drive copy of the Papers presented throughout the conference. One of the most interesting to me was the follow up report on the *2019 AN Railcar detonation by the IME at the U.S. Army Dugway Proving Ground to aid the IME in underpinning algorithms used in the IMSAFER Quantitative Risk Assessment tool. *Debris Collection Efforts following a Large-Scale AN Detonation by Joshua Hoffman-IME. Risk Criteria for Quantitative Risk Assessment by Joshua Hoffman-IME. Let me know if you're interested in checking it out.

Don't forget, we've scheduled our annual scholarship shoot for Saturday May 30th, 2020 at Coon Creek Trap Club in Lincoln. As this is being written, we're hopeful that we can hold to the schedule, but it's possible that the COVID 19 situation will require us to reschedule. In the meantime, get your teams of four organized. As we get closer to the date and we can make a decision one way or the other, we will send out a notification by e-mail and also put a notice on our website.

Until then Be Safe and enjoy the newsletter.

Your President,
Mike Chiurato

The Primer

Editors Notes:

The 2019 business meeting held on February 22nd was another successful ISEE Golden West Chapter Crab Feed. The weather was amazing. We were hoping that the Executive Director of the ISEE would have been able to present the Presidents Award that was presented to Mike Chiurato at the ISEE Conference this year but, he was not available. I will not tell him that he was replaced by the Cook. Pictured below is Golden West Chapter President Mike Chiurato (Left) receiving his award from Mike Burneson, Board Member, Newsletter Editor and Cook.



Continued on next page.

Editors Notes Continued:

We had a great turnout and three very entertaining presentations. Don Robinson presented his story of how he started his journey into gold mining. He was a good story teller and we were very saddened to hear that he had just recently lost his wife. Thank you for sharing your story Don. Ladd Stephenson of Syar Industries one of our oldest members in more ways than one, gave a presentation on the Auburn Dam Project and The Warm Springs Dam Project back when he still sported a full head of hair. Great job Ladd. Our last presenter was our long time member Eric Bennett and Harry Douglas of EROCK Associates LLC. They showed some incredible video of a new type of drone technology LiDAR scanning device that was extremely interesting. Great job EROCK. The business meeting was conducted. The minutes from the last meeting were read and approved and the election was held for the positions of Treasurer and Board member. Jerry Fulghum and Mike Burneson were nominated and re-elected to fill those positions. Mike Chiurato ran a great meeting and had acquired really nice raffle prizes. Mike Chiurato presented Secretary Joe Stack and Treasurer Jerry Fulghum with an award given to the chapter at the International Conference for the Chapter Quality Operations Award. Mike also presented another award that was presented to the chapter for the Chapter Communications Award. I guess that means website and newsletter but, I am not really sure. I must take time to congratulate all of the officers and board members of the GWC for the outstanding teamwork that goes on all year long. Thank you Wes Bender for helping us keep the bus between the white lines. Wes you have always been our guiding light and you are very much appreciated by all of us. It was a real treat to see all of the members and guest at the meeting. A big thank you to Lars Johansen . Without the support of Alpha Explosives the show would not go on. It was great to see past president Bill Reid who just retired from Bodean. Way to go Bill. I really enjoyed seeing our long time member Tim Hurley and it was good to catch up. I am already thinking how to make next year's event even better. I promise to cook up a good meal for the Wesley L. Bender Scholarship Sporting Clays Shoot on May 30th. Please plan on attending and support your chapter by helping fund the four scholarships we have granted. The following pages have a few photos from the dinner. With COVID-19 happening as I complete this Spring edition of the Primer I hope that all of our members and supporters stay safe and healthy.

Lake Herman Mike Live @ the Rock

The Primer

Editors Notes Continued...



The business meeting requires a lot of effort by many. President Mike Chiurato and his wife Donna purchased and acquired all of the raffle prizes, beverages and made the arrangements to open up the hall. Mike and Donna had their wedding reception at the historic Mt. Pleasant Hall. Paul and Barbara Drake once again provided a fantastic sound system and outstanding table decorations. Jerry Fulghum outdid himself this year on desserts. The weeks of planning. The trip to purchase the food for the sixty attendees was worth every minute. The GWC group pretty much finished up 200 lbs of crab, 40 pounds of tri tip, 30 pounds of chicken, 8 pounds of pasta w/ marinara and enough salad to fill all of the tables in the Hall. Did I mention the fantastic desserts?

Great Job Team.

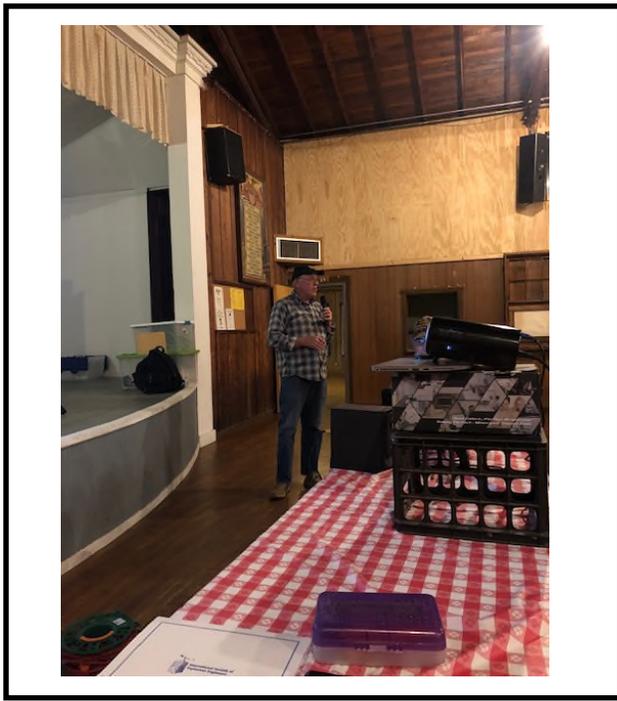
Editors Notes Continued:



upper left Don Robinson Gold Miner.

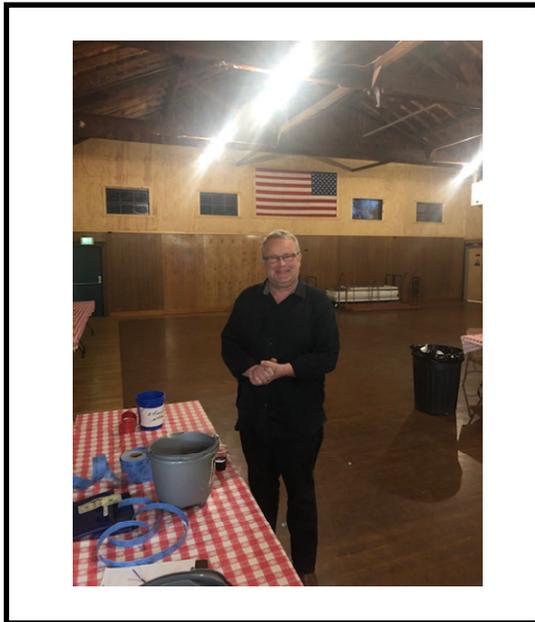
lower left Ladd Stephenson Syar Industries.

lower right Eric Bennett and Harry Douglas of EROCK Associates, LLC.



The Primer

Editors Notes:



upper left Lars Johansen Alpha Explosives.

upper right Happy members and guest.

lower photo Scholarship winner Cody Mallmann in the checkered shirt and his Mom, Paula.



Golden West Chapter 8th Annual Scholarship Fundraiser

When: 8:00 am on Saturday May 30th
Where: The Coon Creek Trap & Skeet Club
5393 Waltz Rd, Lincoln, CA 95648

Cost: \$100.00 per person

Coon Creek Trap & Skeet Club Located in Lincoln California



The cost is \$100.00 per person. For that \$100.00, each participant will get 100 shells, a two and a half hour round of sporting clays and lunch.

Those that want to bring RV's can for \$10.00 per night. They get electrical and water. They need to reserve in advance. We will have an early lunch after we shoot. We will hold a 50/50 raffle and we will hold a raffle where you could win a gift certificate to Bass Pro Shop. All revenue from this event will go directly to our scholarship fund. We will issue trophies to several different categories. Team Awards, Top Gun Men, Top Gun Women and Top Gun Youth.

Come on out and support the chapter.

Contact: Mike Chiurato at 916-719-4507 or Mike Burneson at 707-486-2211 by May 15th, 2020 if you plan on attending.

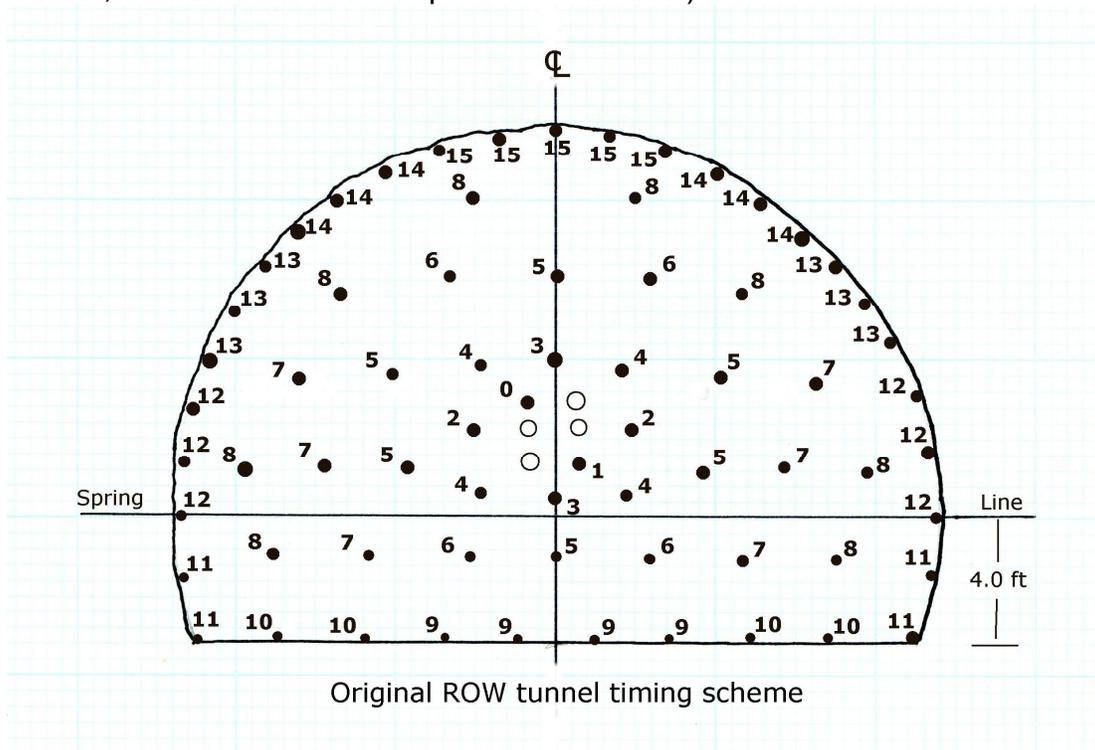
Coon Creek offers many different shooting disciplines, from Trap, International Trap sometimes called Olympic Trap, Bunker Trap, Skeet & Sporting Clays.

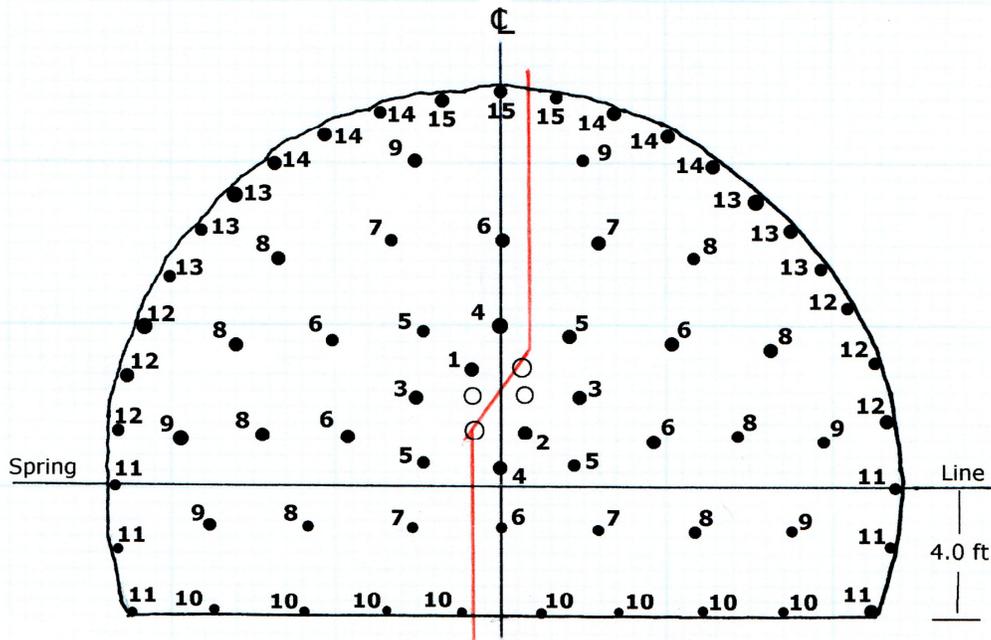
Roosevelt Dam Lake Tap Contract (cont.)

by Wes Bender

ROW Tunnel.

Once the River Outlet Works excavation was complete, the ROW tunnel could be driven from the back of that excavation and proceed around the left abutment of the dam. For the first 10 rounds (approximately 120 feet) of the ROW tunnel, the Bureau required a cautious approach to minimize vibration on the buttresses. They originally mandated a three-stage blasting scheme of drilling, loading and detonating the opening holes (up through delay period 6), mucking it out, doing the same for delays 7 through 10 and mucking it out, and then drilling, loading and shooting the perimeter holes (delays 11 through 15). This would be quite time consuming and we felt that it wasn't completely necessary. The time delay between the 6th and 7th delay detonators was 0.6 seconds. We reasoned that, before that 0.6 second delay period ended, there really wasn't any further vibration or backbreak occurring, so there wasn't any particular benefit to stopping and mucking out and then drilling and loading to shoot the next phase. I developed a proposal for using a two-stage scheme instead. We would split the stages between the 9th and 10th delays. We proposed that we load and shoot one round using their three-stage method and then load and shoot one round using our proposed two-stage method. If the vibrations generated were within 10% using the two methods and there was no excessive backbreak, we could then continue to use the two-stage method. (I had a third method that I would have preferred, shooting the round full face and dividing the round into halves initiated 42 ms apart as shown in the second diagram, but that would have been asking a bit more than the Bureau might consider, so we held it back for possible later use.)





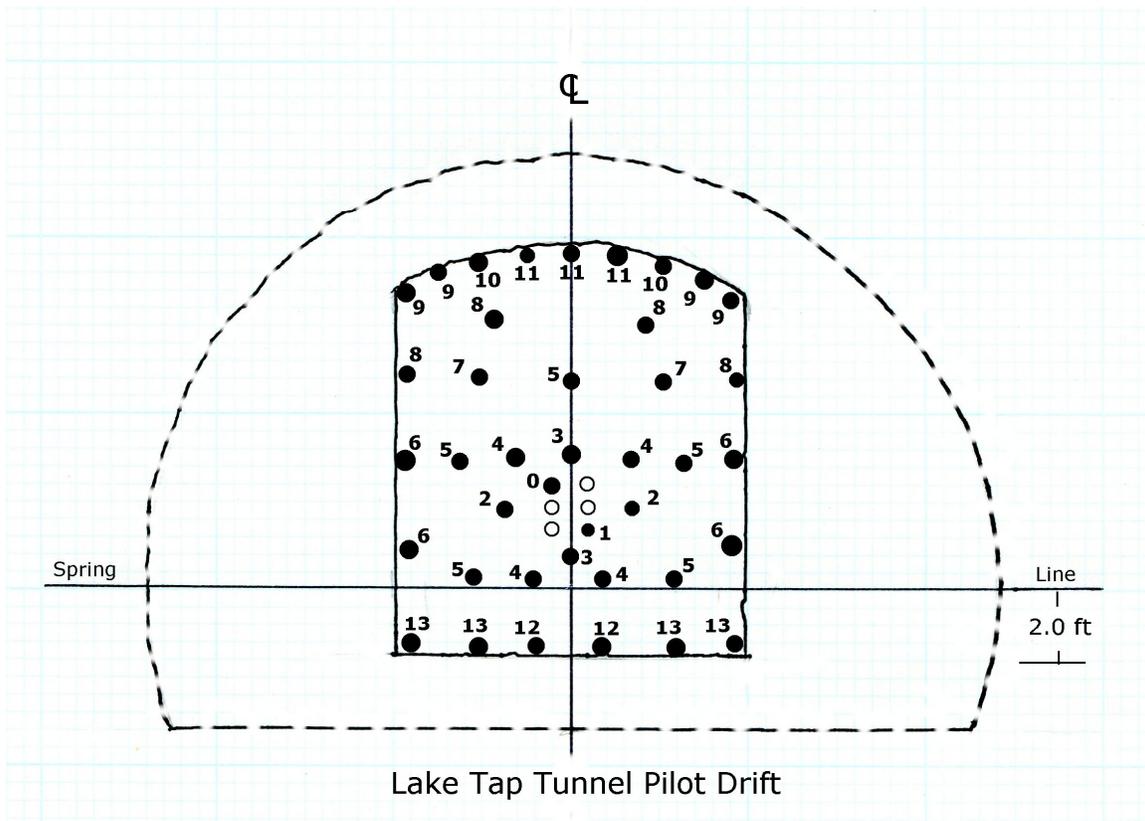
Alternate ROW tunnel timing scheme

In my Alternate timing scheme above, no more than 4 holes will be detonating simultaneously. Holes to the left of the red line are connected in one bundle and the holes on the right to another. Two 42ms Noiseless Trunkline Delays are initiated from the left bundle and detonate the cord on the right bundle. The zero delay has been replaced by a number 1 delay so that the first hole will not detonate before the right half detonators have seen their initiating signal. This precludes cut-offs of the Nonel tubing. Some rearranging of the remaining delays is required. (Delays were only available in 0 through 15.) It's prudent to provide the redundancy of the second 42ms NTD to make sure the second bundle is initiated. If one bundle does not fire, it could freeze the round which would then be extremely difficult and somewhat hazardous to muck out.

In any case, the two phase scheme showed no increase in vibration, was approved and the tunnel successfully driven to station 5+00.00, with the two phase scheme switching to full face after the first 10 rounds had been shot.

Lake Tap Tunnel.

When the ROW tunnel reached station 5+00.00, full face driving was discontinued and a pilot tunnel was driven. While the ROW Tunnel rounds were drilled 10 – 12 ft deep, the pilot tunnel holes were limited to a depth of 8 ft. This reduces the pounds per delay, but the powder factor will normally have to be higher because of the reduced area of the face. The pilot drift was 11 feet tall and 8 feet wide. After the pilot drift is driven a short way ahead, the remaining rock is blasted carefully out to the 22 ft diameter of the Lake Tap tunnel.



Penstock Tunnel.

After the ROW tunnel had passed station 11+00.00, the 18.5 ft diameter penstock tunnel could be driven toward the powerhouse. It used a round design similar to the ROW tunnel. The tunnel stopped short of penetrating the powerhouse. (The generator in the powerhouse was to be replaced with one that could handle the increased head of water that the raised dam would provide, and that contract would include the completion of the last few feet of the new tunnel when the actual penstock connections were known.) The Penstock Tunnel passed in relatively close proximity, both horizontally and vertically, to several protected structures and vibration criteria mandated smaller charges per delay and shorter rounds. The following are my station by station estimates for explosive quantities to stay within the specified vibration limits:

Penstock Sta 0+00 to 0+50 - Vibration limited to 5.0 in/sec measured at the left spillway gate structure. Explosive weight per delay starts higher than will be required, but gradually declines to 20 lbs per delay at Sta 0+50.

Sta 0+50 to 1+59 - Vibration limited to 5.0 in/sec measured at nearest point in the Left Access Adit. Explosive weight starts at 20 lbs per delay at Sta 0+50 and declines to 5 lbs per delay on opening holes (10 lbs per delay for later holes) at Sta 1+59.

Sta 1+59 to 2+58 – Vibration limited to 10.0 in/sec measured at nearest point inside the Left Access Adit (from the earlier contract). Explosive weight limit should be a constant 12 lbs per delay for opening holes and 24 lbs per delay thereafter. Secondary recording at the power plant (limit of 2 in/sec).

Sta 2+58 to 2+83 – Vibration limited to 5.0 in/sec measured at nearest point in the Left Access Adit. Explosive weight limit drops to 5 lbs per delay for opening holes and then increases to 10 lbs per delay at Sta 2+83. Limit for later delays is approximately 20 lbs. Secondary recording at power plant (2 in/sec).

Sta 2+83 to 3+00 – Vibration limited to 2.0 in/sec measured at the power plant. Explosive weight limit starts at 10 lbs per delay and declines to 6 lbs per delay at Sta 3+00. Later delays approximately double. Secondary recording for Penstock #2 at the Y in Nellie's Chamber (5 in/sec and later 10 in/sec w/in 50 ft).

Sta 3+00 to 3+55.80 – Vibration limited to 10.0 in/sec measured for Penstock #2 in Nellie's Chamber. Explosive weight limit starts at 6 lbs per delay and may get as low as 2 lbs per delay at the end of the tunnel at Sta 3+55.80, a distance of 20 feet from Penstock #2. Shorter rounds will be required to meet the vibration limit. Secondary monitoring at the power plant (2 in/sec).

The new Penstock Tunnel required the most adjustment to explosive weights because it passed in close proximity to several objects to be protected from vibration. A contributing factor was the sharp change in vibration limit as the 50 ft distance was reached for some objects. A sliding-scale limit would have been more appropriate, but would have required continual blast design changes.

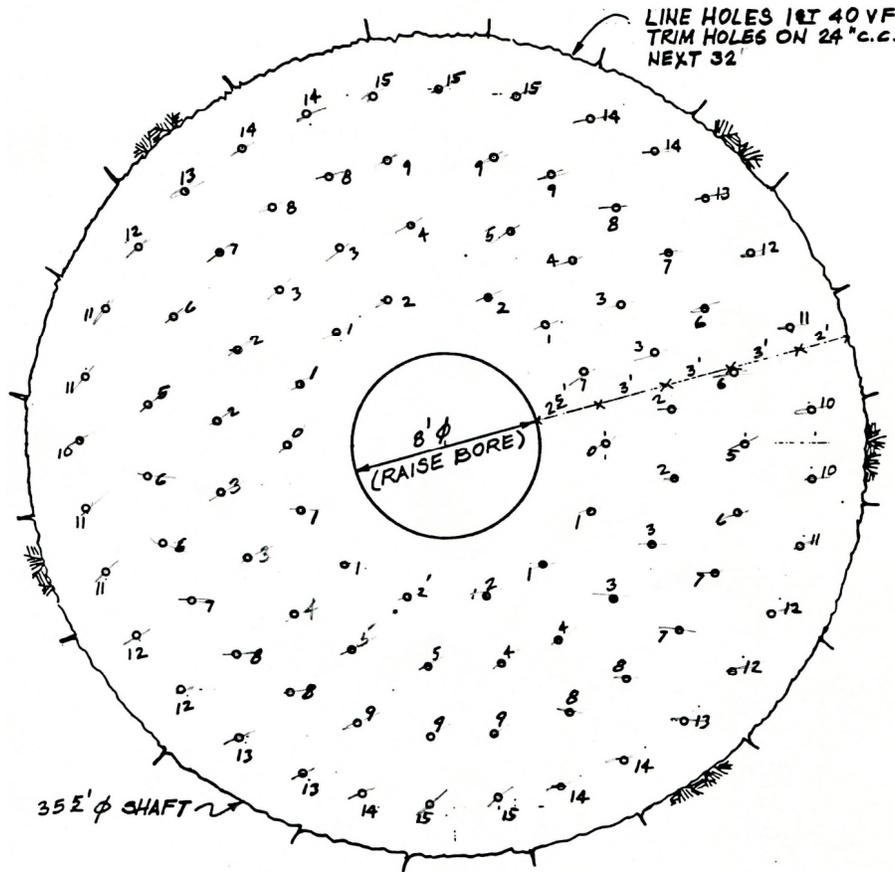
Gate/Control Structure Shaft.

Once the ROW Tunnel had been driven past station 10+21.00, excavation of the combination gate shaft and control structure shaft could be started. A raise bore machine was set in place on the surface directly above station 10+21.00 in the ROW Tunnel (adjacent to Apache Trail AZ highway 88). A 12 inch diameter hole was drilled down into the ROW Tunnel, the drill bit removed and an eight foot diameter raise bore cutting head installed. An eight foot shaft was then raise-bored up to the surface.

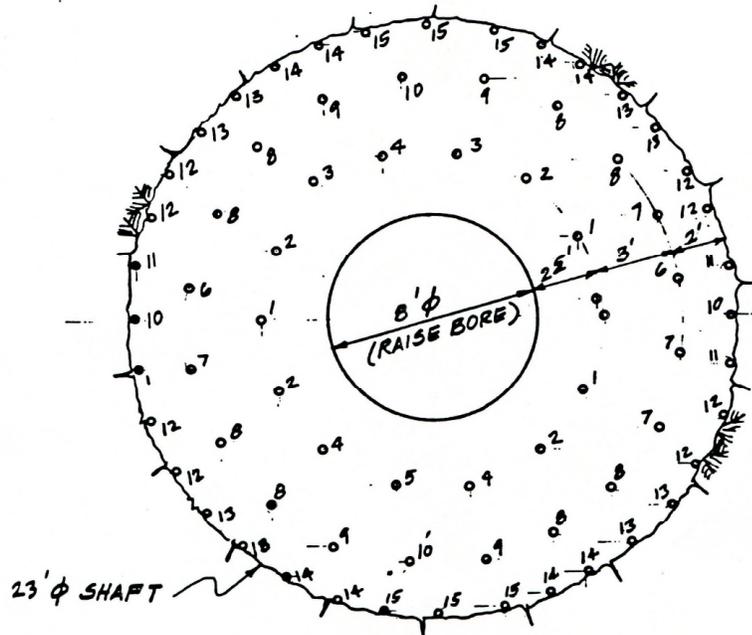
The top 72 feet of the shaft was the Control Structure and was 35.5 ft in diameter. The remainder of the 320 ft deep shaft was 23 ft in diameter and made up the Gate Shaft.

After the raise bore was complete, the top 40 feet of the perimeter of the Control Structure was line drilled with 2 inch holes on 6 inch centers. The next 32 feet of the perimeter was smooth-blasted. Below that the Gate Shaft commenced with a diameter of 23 ft. Its perimeter was also smooth blasted. All blasted rock fell down the 8 ft raise bore and was mucked out through the ROW Tunnel.

Shaft blast designs were as follows:



Control Structure Delay Pattern

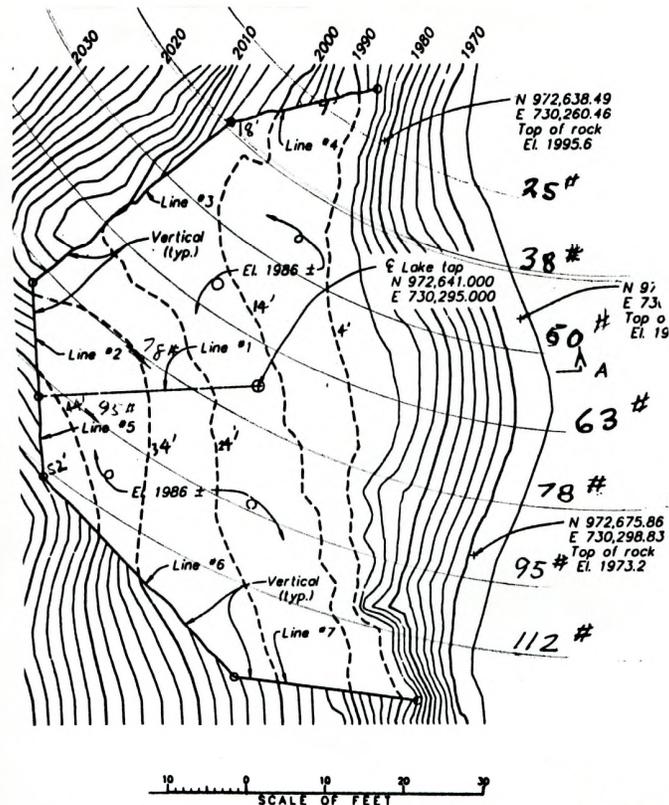


Gate Shaft Delay Pattern

Underwater Lake Tap Bench excavation.

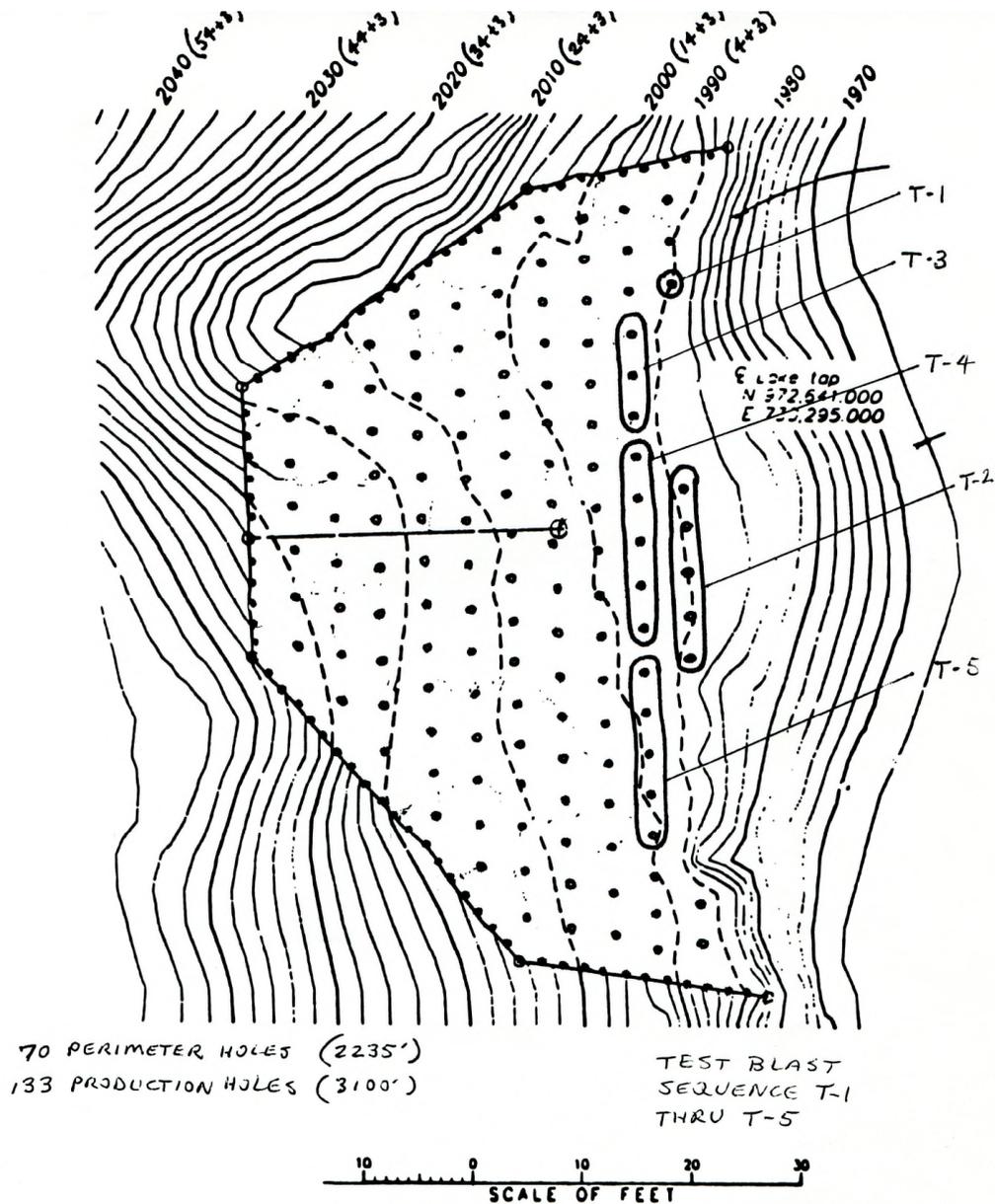
In the specifications, the Bureau was quite concerned about a small fault or weak zone near the Lake Tap bench location and while they didn't preclude underwater blasting to excavate it, they were going to carefully review plans to blast it. They were also concerned about the existing intake structure that was a little over 50 feet from the nearest corner of the new Lake Tap bench. The specifications required a minimum of five and possibly as many as eight test blasts for the bench excavation. Knowing of the Bureau's concerns, Torno had developed a plan whereby they would excavate the Lake Tap Bench by drilling out the bench excavation on a grid from a barge, using large diameter drills, closely spaced holes and then breaking out the webs between holes. This would require divers setting up an underwater template to properly locate the holes and control the drill bit, but would result in reduced vibration in the surrounding rock.

I needed to develop a "Plan B" to blast the bench excavation in case their drilling plan didn't work or wasn't acceptable. Both schemes were included in the bid with the intent of trying the mechanical means first.



Lake Tap Bench

This plan view of the underwater Lake Tap Bench is annotated on the right edge with my estimate of the amount of explosive per delay that we could load, while keeping blast vibration below 5 in/sec at the existing intake structure.

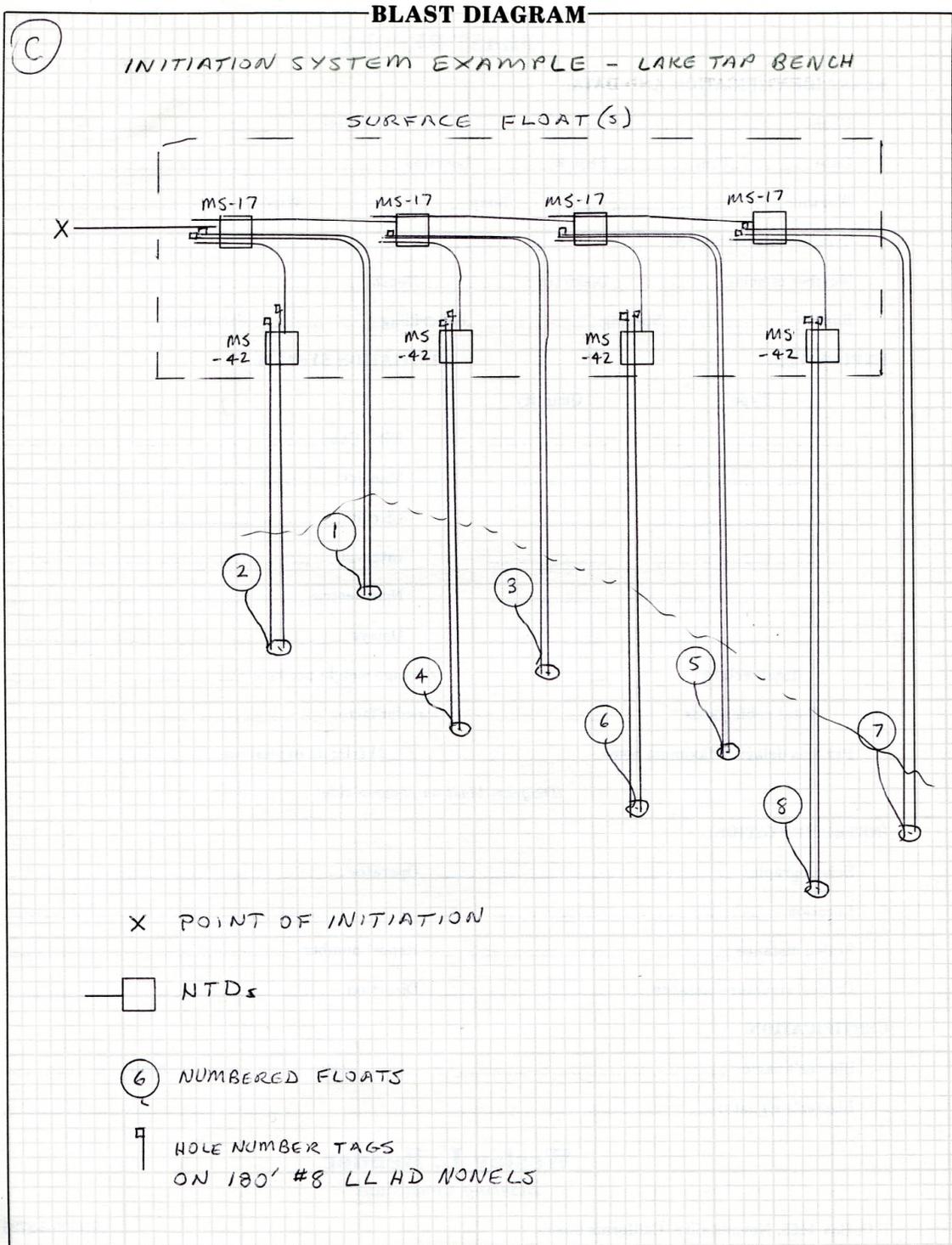


Lake Tap Bench Test Blasts and Hole Pattern

The possibility existed that the Bureau might require more than the five test blasts, but if vibration was low enough, five would probably have sufficed. I sent a copy of the above sketch to the divers prior to the bid so that they could determine their cost to handle the drills and the underwater loading.

I calculated a powder factor of 3 lbs per cubic yard would be required to blast the rock underwater. Actual hole loading would vary from 2.8 to 3.2 lbs per cubic yard depending upon hole depth. We included the provision to increase or decrease that amount as necessary by changing the drilling pattern.

The initiation system would be connected as shown in the next diagram. (My apologies for the rough drawing. This was what I submitted to Torno and their graphics group cleaned it up for the bid package.)



As indicated, all initiation system connections would be made on floats on the lake surface. I wasn't too keen on using detonating cord down lines for each hole or group of holes. It would have been difficult keeping them separated so

that they didn't accidentally touch and fire out of turn in the 130 feet or so of vertical distance from the blast holes to the surface. Ensign-Bickford made HD Nonels that would withstand the water pressures, but didn't make them in long enough lengths. While developing the plan for the bid, I contacted Darrell Brown of E-B and asked if they would possibly consider making #8 delay HD Nonels in 180 ft lengths. Darrell came through with a quote for me, thus solving the initiation system cross-firing problem. Each hole would require two detonators. The initiation scheme that I envisioned used MS-17 and MS-42 Noiseless Trunkline Delays on the surface floats. Numbered floating tags on light lines led to each explosive charge. They would be gathered after the shot to determine if there were any mis-fires. Other than the use of the numbered floats, the blast design would be somewhat familiar to most surface blasters using NTDs.

I didn't consider decking charges in the holes because we wouldn't have had any problem staying below the vibration limit of 5 in/sec at the existing intake structure. In addition, it would have been difficult to verify that all of the lower decks had detonated.

Once Torno's plan of mechanically excavating the bench proved to be successful, and following successful excavation of the tunnels and shafts, my presence was no longer needed on site, so I moved on to other projects.

The final contract to actually raise Theodore Roosevelt Dam by 77 feet and to put the new spillways in place was accomplished by J. A. Jones Co. They did some blasting on their contract, but I wasn't involved in any of it. They did rent their blasting seismographs from me however.

Here is a link to a video on the history of Roosevelt Dam:

<https://www.youtube.com/watch?v=vS4CKsu6UNg>

The next video shows the newly raised dam and depicts both of the spillways gushing water. Unfortunately, the left spillway gates were opened too slowly and water started to puddle in the flip bucket. There wasn't sufficient head to eject that water, so most of it just poured over the end of the flip bucket and down onto the parking area adjacent to the powerhouse. (How do I know? A friend was there at the time.) When spilling with sufficient velocity, the water arcing out from each flip bucket should collide just over the plunge pool in the river, thus dissipating some of the energy.

<https://www.youtube.com/watch?v=vaYPCUO4QFw>

The final video is a short one that shows water being released through the River Outlet Works three nozzles.

<https://www.youtube.com/watch?v=vjS0K2yceQw>



State of California
 Department of Industrial Relations
 Division of Occupational Safety & Health
 Mining & Tunneling Unit



Gas Tester, Safety Representative and Blaster Exam Requirements

Experience is required in the type of work for which you're requesting license or certification:

Gas Tester: at least 1 year of underground experience

- \$15 for any or all GT exam portions
- Must have experience in gassy situations if applying for gassy certification
- Bring your testing instrument and unexpired calibration gases

Safety Representative: at least 2 years of underground safety experience

- \$15 for any or all SR exam portions
- Must have experience in gassy situations if applying for gassy certification

Blaster: at least 3 years of blasting experience

- \$15 for any or all blasting exam portions
- Describe your explosive experience, including what kind of explosive work you have done, and what kind of explosive materials you have used.

Each examinee must provide the following at least 10 days before the exam:

Application and Form W-1.

- Complete both pages of the appropriate application, and sign on Page 2.
- Complete all pages of the Form W-1, and sign on Page 4. All pages must be submitted.

Check or Money Order, payable to "State of California".

- We cannot accept cash or credit/debit card payments.
- We cannot issue refunds.

The following must be provided at the time of the exam:

One of the following forms of unexpired photo* identification:

- Driver's license
- State-issued ID card
- Military ID card

One of the following:

- Birth Certificate
- Current Passport

* A temporary ID without photo must be accompanied by a current passport or other item with photo. M&T Certification or License cannot be used as an ID.

Exam Locations and Dates

Contact the following offices for scheduled dates and times:

<p>District 1 (North) 1750 Howe Ave, Suite 300 Sacramento, CA 95825-3369 (916) 574-2540</p>	<p>District 2 (Central) 6150 Van Nuys Blvd, Suite 310 Van Nuys, CA 91401-3345 (818) 901-5420</p>	<p>District 3 (South) 464 W. Fourth St., Suite 354 San Bernardino, CA 92401-1442 (909) 383-6782</p>
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NOTE: Following a failed exam, we require 90 days to have elapsed before re-taking the exam.

The Primer



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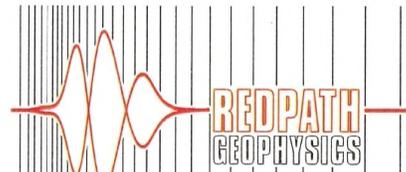
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Current Board Members and Officers are:

President Mike Chiurato
Treasurer Gerald "Jerry" Fulghum
Secretary Joe Stack
Board member Todd Quigley
Board member, Newsletter Editor Mike Burneson
Website Master Wes Bender

Chapter Activities

Wesley L. Bender
8th Annual Scholarship Fundraiser
Saturday, May 30th

Crab Feed Business Dinner
Saturday, February 20, 2021

The Primer

Fire in the Hole...

When one door closes and another door opens, you are probably in prison.

To me, "drink responsibly" means don't spill it.

When I say, "The other day," I could be referring to any time between yesterday and 15 years ago.

Interviewer: "So, tell me about yourself."

Me: "I'd rather not. I kinda want this job."

Cop: "Please step out of the car."

Me: "I'm too drunk. You get in."

I remember being able to get up without making sound effects.

I had my patience tested. I'm negative.

Remember, if you lose a sock in the dryer, it comes back as a Tupperware lid that doesn't fit any of your containers.

If you're sitting in public and a stranger takes the seat next to you, just stare straight ahead and say "Did you bring the money?"

When you ask me what I am doing today, and I say "nothing," it does not mean I am free. It means I am doing nothing.

I finally got eight hours of sleep. It took me three days, but whatever...

I run like the winded.

I hate when a couple argues in public, and I missed the beginning and don't know whose side I'm on.

When someone asks what I did over the weekend, I squint and ask, "Why, what did you hear?"

I don't remember much from last night, but the fact that I needed sunglasses to open the fridge this morning tells me it was awesome.

When you do squats, are your knees supposed to sound like a goat chewing on an aluminum can stuffed with celery?

I don't mean to interrupt people. I just randomly remember things and get really excited.

When I ask for directions, please don't use words like "east."

It's the start of a brand new day, and I'm off like a herd of turtles.

Don't bother walking a mile in my shoes. That would be boring. Spend 30 seconds in my head. That'll freak you right out.

That moment when you walk into a spider web suddenly turns you into a karate master.

Sometimes, someone unexpected comes into your life outta nowhere, makes your heart race, and changes you forever. We call those people cops.

The older I get, the earlier it gets late.

My luck is like a bald guy who just won a comb.