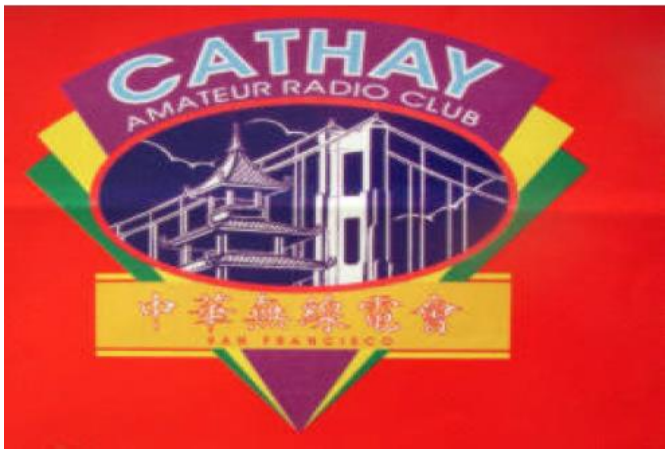


Cathay January 2024

www.cathayradio.org

President: George Chong, W6BUR **email:** *W6BUR@comcast.net*
Vice President North: Leonard Tom, *NX6E* **email:**nx6e@hotmail.com
Vice President South: Bill Fong, *W6BBA* - **email:**w6bba@arrl.net
Secretary/Membership: Rodney Yee, *KJ6DZI* - **email:**rodyee2000@yahoo.com
Editor: Rodney Yee, *KJ6DZI* - **email:**rodyee2000@yahoo.com
Treasurer: Vince Chinn aka Mingie, *W6EE* -**email:**vince@vincechinncpa.com
Web Master: Edison Fong – *WB6IQN* - **email:**edison_fong@hotmail.com
Mission: The Cathay Amateur Radio Club is basically an active social club of Ham Radio Operators and their spouses. We support local community requests for HAM emergency communications. Several of us are trained in CPR/ First Aid and are involved with community disaster preparedness.

Monday Night Net Time: 9 PM Local Time/PST, As of 8/21/2023 we are switching over from using Repeater: WB6TCS to **Nick Carsion's Repeater: WA6GEL UHF 444.80000 Mhz, Offset +5Mhz, CTCCS/Tone PL 179.9 Hz on Monument Peak, Milpitas.**

If you cannot reach the fore-mentioned machine, please use WA6GEL UHF 4448.8 Mhz Offset +5Mhz, CTCCS/Tone PL173.8 which is on Mt. San Bruno.

The CARC Monday night net is the best way to find out the latest club news. All check-in are welcome.

Message from the President: George Chong, *W6BUR*

Hello CARC Members and Friends;

Happy New Year! I hope you all had a very pleasant holidays with family members and friends.

Many thanks to Nick Cassarino for the use of repeater – WA6GEL for our CARC Monday Night Net.

Additional folks are needed to help out with conducting the CARC radio net on Monday nights. Please contact Ed Fong (edison_fong@hotmail.com) if you are interested.

I wish to thank our CARC members that set aside their valuable time to participate in our Monday night's nets.

Upcoming FARS/Cathay Radio Club Dinner

Please set aside Friday February 23, 2024 at 6:00 pm for the Annual FARS/CARC Winter dinner.

The dinner will be held at

Blue Pheasant Restaurant
22100 Stevens Creek Blvd.
Cupertino, CA 95014
Phone: 408-255-330

For more information and sign up for the dinner please go
https://www.fars.k6ya.org/banquet/banquet2024/#signup

There will be a several prizes that are well worth over $1,500 to be raffled at the dinner. The raffle grand prize will be a brand new Yaesu FT710 HF all mode 100-watt radio.

Choice	Menu Description	Price
Beef	Roast Prime Rib of Beef	$54
Fish	Broiled Salmon w/ dill sauce	$41
Chicken	Breast of Chicken Jerusalem	$41
Veg	Pasta Primavera	$41

All dinners include a desert.

- Ed Fong

CARC Annual Christmas Party Summary

Ed Fong hosted his CARC/SARES Annual Christmas party.

Post-Christmas party details and pictures are at the end of newsletter.

Introduction Tech Article:

With the global worldwide green energy initiatives, the hunt for massive new sources of energy storing lithium has been ignited.

Currently China has a near lock on the world's metallic energy supply chain. It controls the world's: processing/capacity: 66% of the lithium processing, 95% manganese capacity, and 75% cobalt capacity.

In the expanding energy markets, new metallic energy supplies are needed and also to diversify sources of processing to prevent a monopolistic control of the energy markets.

Please read the Technical Article about a potentially a new and large source of lithium.

CARC Final News Wrap Up

Chat sub s'em to all you CARC members! - George W6BUR.

Public Service Announcements

HAM CRAM / HAM Licensing

For upcoming HAM Licensing locations please refer to:
http://www.arrl.org/find-an-amateur-radio-license-exam-session

Auxiliary Communications Service (ACS)

The Auxiliary Communications Service (ACS) is a unit of trained professionals who supply communications support to the agencies of the City and County of San Francisco, particularly during major events/incidents. ACS goals are the support of gathering and distribution of information necessary to respond to and recover from a disaster.

The ACS Net begins at 1930 hours (7:30 p.m. PT) local time each Thursday evening, on the WA6GG repeater at 442.050 MHz, positive offset, tone 127.3 Hz. The purpose of this net is to practice Net Control skills, practice checking in with deployment status in a formal net, and to share information regarding upcoming ACS events. Guests are welcome to check in. ACS members perform Net Control duty on a regular basis. On the second Thursday of each month, the net is conducted in simplex mode on the output frequency of the WA6GG repeater, 442.050 MHz no offset, tone 127.3 Hz.

ACS holds its General Meetings on the third Tuesday of each month from 1900 hours to 2100 hours local time. Currently meetings are exclusively conducted over Zoom during the COVID-19 pandemic, ACS looks forward to meeting in person again as soon as possible.

Upcoming meeting dates in 2024 are:

- January 16, 2024
- February 21, 2024
- March19, 2024

Location of in person future ACS meetings are yet to be determined as the regular location is under reconstruction. All interested persons are welcome to attend. For further informationcontact Corey Siegel KJ6LDJ <kj6ldj@gmail.com>.

For more information, please attend an ACS meeting, check in on the ACS radio net, or call 415-558-2717.

Free Disaster Preparedness Classes In San Francisco – NERT Taught by San Francisco Fire Department (SFFD).

https://sf-fire.org/nert/nert-calendar-meetings-trainings-events

NERT is hosting three session with Stop the Bleed organization for interested NERT graduates.

This highly anticipated class conducted by www.stopthebleed.org is available to NERT graduates. You may join **one** of three scheduled sessions on March 15th or 16th.

A bleeding injury can happen anywhere. Life-threatening bleeding can happen in people injured in serious accidents or disasters. Instead of being a witness, you can become an immediate responder because you know how to STOP THE BLEED®.

You'll learn three quick techniques to help save a life before someone bleeds out:

- How to use your hands to apply pressure to a wound;
- How to pack a wound to control bleeding; and
- How to correctly apply a tourniquet. These three techniques will empower you to assist in an emergency and potentially save a life.

Registration:
Friday, March 15, 9:00 am - 1:00 pm

Saturday, March 16, 8:00 am - 1:00 pm (Optional: Join NERT Advisory Board office hours from 8:00 am - 9:00 am)

Saturday, March 16, 2:00-6:00 pm

For more information about Stop the Bleed, see the attached flyer. You can visit their website on www.stopthebleed.org.

+ Recertifications

1/10/2024 to 1/17/2024 5:30pm - 9:30pm
2310 FolsomSan Francisco, CA94110
Registration

***SFFD DOT** is the Fire Department Division of Training. All participants walking, biking or driving **enter through the driveway gate on 19th St.** between Folsom and Shotwell. Parking is allowed along the back toward the cinderblock wall.

Visit ***www.sfgov.org/sffdnert*** to learn more about the training, other locations, and register on line. Upcoming Special NERT Events.

San Francisco Police Department: Auxiliary Law Enforcement Response Team (ALERT)

The Auxiliary Law Enforcement Response Team (ALERT) is a citizen disaster preparedness program designed. The ALERT program is for volunteers 16 years of age or older, who live, work, or attend high school in San Francisco.

Graduates of the San Francisco Police Activities League (P.A.L) Law Enforcement Cadet Academy are also eligible to join.

ALERT volunteers will no longer need to complete the Fire Department's Neighborhood Emergency Response Team (NERT) (www.sfgov.org/sfnert) training and then graduate into two 8 hour Police Department course specifically designed for ALERT team members.

ALERT members will work closely with full-time and/or Reserve Police Officers in the event they are deployed after a disaster. The Basic ALERT volunteer will have no law enforcement powers other than those available to all citizens.

SFPD ALERT Training (New Members)

The next SFPD ALERT training class has been scheduled for: TBD

*Class date indicated are only for new members

IMPORTANT- All participants must complete the background interview process in order to be eligible to attend the ALERT training class.

Eligible ALERT participants may register fora training class by contacting the ALERT Program Coordinator, marina.chacon@sfgov.org, or by telephone at 415-401-4615.

SFPD ALERT Practice/Training Drill

All active/trained ALERT members are asked to join us for our next training drill, via scheduled for on TBD

For more information on the San Francisco Police Department ALERT Program, email us at sfpdalert@sfgov.org, or call Lt. Marina Chacon (SFPD Ret.), SFPD ALERT Program Coordinator, at (415) 401-4615.

For additional information on the web please refer to:
https://sfgov.org/policecommission/alert

Tech Article

ASCE AMERICAN SOCIETY OF CIVIL ENGINEERS

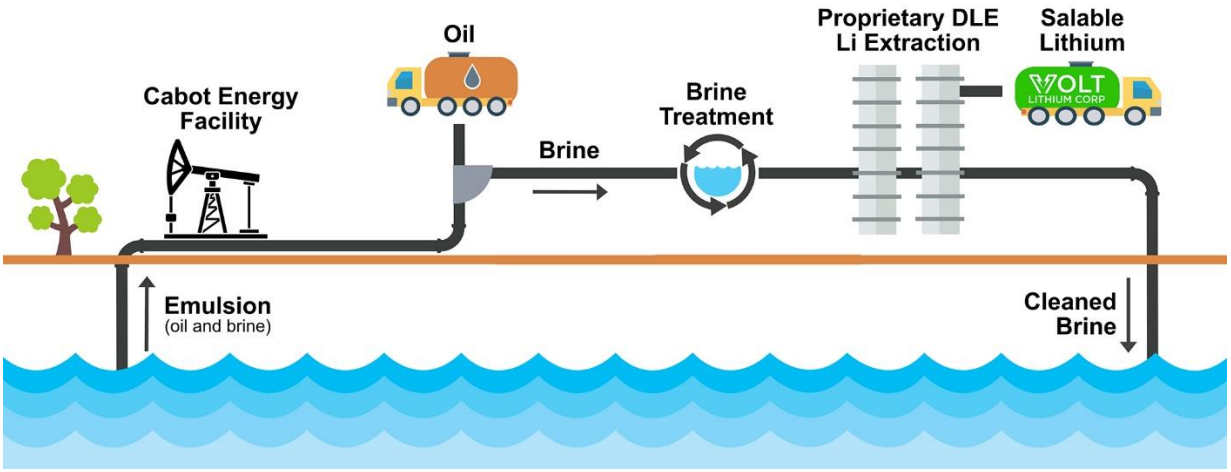
MATERIALS

New methods could extract large lithium stores from brine

By Jay Landers Date**:** 10/26/2023

Is brine the new oil? It potentially could be, if global demand for lithium — a key component of rechargeable batteries for electric vehicles, energy storage, and consumer electronics — continues to soar. Although lithium is present in various brine formations around the world, to date only certain brine fields in South America have been found to contain lithium in concentrations sufficient to justify the expense of extracting the critical mineral. Elsewhere, lithium is typically mined.

However, the growing demand for lithium, coupled with technological advances in methods used to extract it from brine, is sparking intense interest in what is known as direct lithium extraction. DLE can be done using such sources as oil field, geothermal, and other brines that historically have not proved cost-effective to pursue. The new methods offer the possibility of obtaining vast new sources of lithium from brine cost-effectively and in a manner that is much more environmentally friendly than current approaches.



To remove lithium from oil field brine, Volt Lithium employs a pretreatment step followed by its proprietary process for direct lithium extraction. (Image courtesy of Volt Lithium)

Against this backdrop, a nascent industry involving a growing number of startup companies, large oil and gas concerns, and automakers is looking to capitalize on the anticipated lithium boom. Meanwhile, security and supply chain considerations are prompting the United States and other nations to try to facilitate the development of domestic lithium sources, in part to reduce their dependence on China, a key player in the lithium market.

Surging demand

In a March 2022 report titled *The Role of Critical Minerals in Clean Energy Transitions*, the International Energy Agency noted that growing demand for electric vehicles and clean energy technologies is boosting demand for the various types of critical minerals required for their production. Of these minerals, lithium is projected to see the largest spike in demand. By 2040, demand for lithium is expected to increase 42 times relative to 2020 levels, according to the report.

Lithium typically is present in certain hard rock deposits known as pegmatites and in underground brine formations in a dissolved form. As of 2019, more than 80% of lithium was extracted from either Australia, Chile, or China, according to the IEA report. Meanwhile, China accounts for 50%-70% of all lithium refining, the process used to improve the purity of lithium after it has been extracted, the report notes.

Traditional methods for extracting lithium have entailed mining the rock deposits or pumping brine to the surface of salt flats and conveying it through a series of evaporation ponds to concentrate the lithium. Both approaches take a long time to develop, are land-intensive, and can result in significant environmental degradation,

says Holly Stower, the resources and environment lead for the Cleantech Group, a research and consulting firm.

Evaporation ponds are particularly destructive, Stower says. The approach "uses huge swaths of land, uses significant amounts of water, and leaves the land heavily polluted," she says. "It is an environmental disaster."

Many benefits

By contrast, DLE approaches take the form of filters, membranes, ceramic beads, or similar methods that are designed to precipitate lithium from brine in a manner that in many respects resembles an advanced water treatment facility. But instead of treating drinking water, DLE units treat brine pumped from underlying aquifers.

Depending on a particular brine's geochemistry, various pretreatment steps are used to remove solids, hydrogen sulfide, and other contaminants. Adsorption, ion exchange, and solvent extraction are among the most common methods under development to extract lithium directly from brine. After undergoing the extraction process, the spent brine is returned below ground via injection wells.

In this way, DLE methods can be set up faster, require a much smaller footprint, and have much less of an environmental impact compared with traditional lithium extraction processes, Stower says. "It uses less land," she says. "It uses less water. In some cases, it uses less chemical inputs."

Pairing DLE units with renewable energy sources also could help offset the carbon footprint associated with the process, Stower notes.

DLE "offers lower perceived environmental risk and significant environmental benefits vs. traditional brine ponds," according to an April 2023 report, titled *Direct Lithium Extraction: A potential game changing technology*, from the financial institution Goldman Sachs Group Inc. Just as critically, DLE even has the potential to greatly improve operational efficiencies relative to brine ponds, increasing lithium recoveries from the 40%-60% associated with ponds to 70%-90% or more, according to Goldman's report.

Although it may have high upfront costs, DLE "is cost-competitive when adjusted for higher yields," Stower says. In other words, brines containing lithium in concentrations once thought uneconomical may now be worth pursuing.

As a result, DLE approaches are expected to increase lithium supplies significantly in the near future, according to a July 2023 Cleantech report.

But Stower stops short of making any guarantees. "I do want to caveat all of this in the context of this is yet to be proven out at a commercial scale," she says. "Some of these benefits are quite theoretical."

Alternative sources needed

If lithium supply is to keep up with projected demand, DLE approaches are all but inevitable, says Andy Robinson, Ph.D., the president, chief operating officer, and a director of Standard Lithium, a near-commercial lithium development company whose primary operations are in southern Arkansas.

The interior of Standard Lithium's direct lithium extraction demonstration facility in southern Arkansas. (Image courtesy of Standard Lithium Ltd.)

Until now, the lithium market has focused on developing the "highest-grade lithium resources on the planet," Robinson says. Much as hydraulic fracturing enabled the production of natural gas from formations previously considered nonviable, DLE can do the same for lithium, he says. "For the lithium industry to keep pace with the demand required by the energy transition story, alternative resources need to be developed."

For Standard Lithium, the main alternative resource to be developed is the Smackover Formation, a massive brine-laden aquifer extending from eastern Texas to western Florida. The Smackover is "probably one of the best lithium brine deposits outside of Chile and Argentina," Robinson says. However, due to space constraints and environmental considerations, "it's in a part of the world where you can't build evaporation ponds and use conventional processing techniques." Therefore, "DLE will play an increasingly large role in unlocking these very large, broadly unconventional lithium brine resources," he says.

To this end, Standard Lithium is pursuing two DLE projects involving the Smackover in southern Arkansas, including a demonstration plant that is co-located at an existing industrial facility that extracts bromine from brine.

Since beginning operations in May 2020, “we've processed several million gallons of brine through our demonstration plant,” Robinson says. “We are running a small-scale commercial facility, basically, for all intents and purposes.”

Standard Lithium expects to decide next year whether to pursue full-scale development of the facility, according to the company’s website. Standard Lithium also is evaluating development of a second DLE project in southwestern Arkansas.

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Working with oil and gas

To succeed, DLE companies should collaborate with oil and gas companies that already are producing significant quantities of brine as part of their normal operations, says Alex Wylie, the president, CEO, and director of Volt Lithium Corp., a lithium development company with a proprietary DLE process that is focused on extracting the element from oil field brine.

At its testing facility in Regina, Saskatchewan, Volt Lithium uses this equipment to treat oil field brine before it enters the company’s direct lithium extraction process. (Image courtesy of Greg Huszar/Volt Lithium)

By partnering with an established oil and gas producer operating in the Canadian province of Alberta, Volt aims to gain access to valuable brine resources without having to finance, design, and construct new wells, pipelines, and related facilities, Wylie says. “The infrastructure is in place today,” he says. “We don't have to spend all the money on the field development, because it's been done by the oil and gas industry.”

Because there is no need to construct extensive subterranean facilities, such an arrangement is also much simpler to obtain permitting for. “The ability to get into production (with oil field brine) is just much more streamlined when you look at other brines across North America,” Wylie says.

Oil and gas producers increasingly are becoming aware of the value of the lithium present in the brine they generate, Wylie notes. “It's a fantastic alternative for them,” he says. “The reserve life for the lithium will outlast the oil, so they can keep their infrastructure running for longer.” If lithium becomes an “additional revenue source or profit center for (an) oil and gas company, I see a huge opportunity for the (DLE) industry as a whole,” he says.

In fact, energy giant Chevron Corp. is looking into lithium extraction, according to a July 24 Bloomberg story. Meanwhile, ExxonMobil reportedly plans to construct facilities in southern Arkansas to extract lithium from the Smackover. (ExxonMobil declined to comment for this story.)

Enter the automakers

Ultimately, the growth of the EV market comes down to increased access to lithium, says Teague Egan, the CEO of Energy Exploration Technologies, also known as EnergyX, a company developing DLE solutions and longer-lasting battery technologies.

“Sufficient availability of lithium and a balance of demand and supply keeping prices lower are key to the success for the electrical vehicle market and decarbonization efforts,” Egan says. “At least in the medium term, there are no battery technologies that are projected to replace lithium. Hence, unlocking the supply of lithium from lower-grade brine sources as well as other unconventional resources is imperative to the success of decarbonization efforts. Lithium production in the U.S. also has implications on simplifying the supply chain for electric vehicles and ensures supply security.”

Recognizing the importance of lithium to their bottom lines, automakers have begun investing in the industry. For example, in April, General Motors Co. announced that it was leading a $50 million funding round in EnergyX.

Besides their financial motivation, automakers expect that investing in the DLE industry will help them meet sustainability goals, Stower says. “From an environmental perspective, those batteries (made of lithium obtained by DLE) will have a better environmental performance and footprint,” she says.

Given the increasing importance of lithium, the United States and a growing number of other governments aim to ensure the availability of the critical material within their borders. “We see a significant amount of funding into lithium innovators from” the U.S. Department of Energy, Stower says.

For the United States and Europe, “there are huge drivers to have control of supply chains,” Stower notes. Chief among them is the fear that the Chinese government might decide to throttle the distribution of lithium from that country to its geopolitical rivals. “There's a huge supply chain risk there,” she says.

This article is published by Civil Engineering Online*.*

Annual CARC Christmas Party Summary

By Ed Fong – *WB6IQN*

The CARC Christmas Party held on the evening of Saturday December 9, 2023 was a successful blow out party. There was plenty of good food to go around and people were asked to take the left-over food home with them. I spent the next several days eating up the extra food from the party.

I wish to thank all the folks that came to the Christmas Party. We gave out 85 name tags, that is a record attendance. After COVID-19 shelter in place requirements, it was both a very refreshing and nice to see everyone at the party once more again.

Many thanks to all the folks for coming to the party and bringing to the party all the great food - from exotic pies, desserts, and snacks. Some of the home-made stuff was just incredible.

I look forward to hosting the Christmas event every year to catch up with my peers and to learn about the current electronic industry trends along with the latest and greatest in technology to come.

My graduate students come to the Christmas party to make contacts and begin their professional networking, which I strongly encourage. I think I counted five of my students at the Christmas party.

Wendy Krokowski won the grand raffle price, a Lenovo Laptop equipped with a 14 inch screen, a powerful i7 processor, 12G RAM and 256G of SSD. As configured, it was complete and ready to go with Microsoft Office and Windows 10 Pro. Wendy left the Christmas party as one super happy camper. Winning the Lenovo Laptop was definitely an early super Christmas gift for Wendy.

A few of the pictures from the Christmas Party are on the following pages:

Bob Vallio W6REGG - Paul Zander AA6PZ, background Norman Gok KM6YYI, Rad Lee N6TIG, and Walter Chang – AG6FK

Left to right: Kyle (son) Wendy (mother) Krowkoski

Left to right: Wendy Krowkoski, the winner of the grand raffle prize: Lenevo i7 12Gb 256GSSD laptop and Ed Fong-WB6IQN (host) presenting it to her.

Left to right: Fed Schindler Jeff Hutchins, Richard Krokowski

Ed Fong, WB6IQN (Host)

Left to right: Rad, Walter and Fred

Left to right: Tomas Liebold KK6FPP and Amanda KM6OJU

Left to right: Guest Attendee, Marvin Wahl -W6FUV, and Natalie

Left most edge: Mari O'Brian

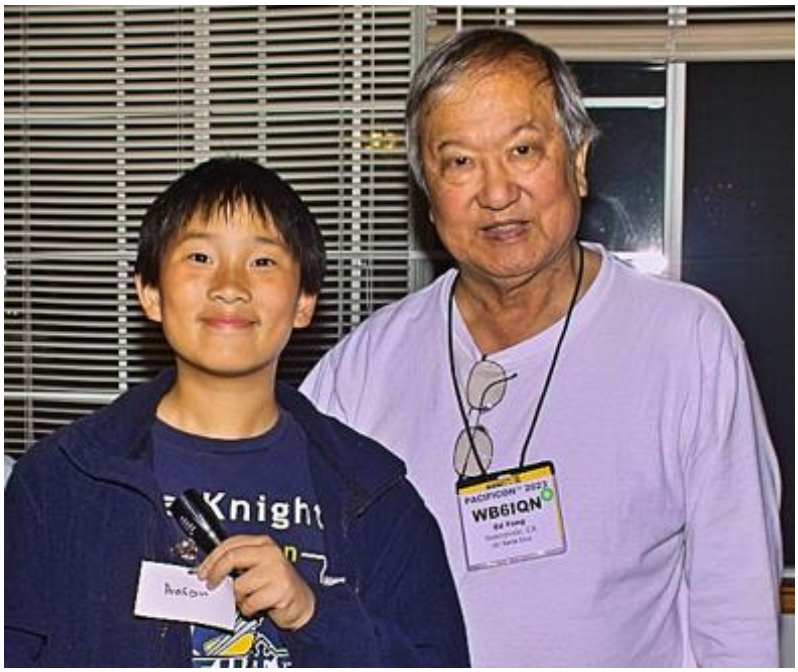
Left to right: Host Ed Fong – WB6IQN (Host) and Kashif Javaid

Background - Mark Metzer

Violet Fong, Linda and Alan Kamas

Jack Schertler

Left Counter Clockwise: Ralph Kruger KC6YDH, Jim Fayh, Jerry Thalls KG6HI, attendee, and Wolfgang Polak AI6SL



Left to right: Arron and Ed Fong – WB6IQN (Host)

Left to right: Jack and Mark Schertler. Background: Mike Facio

73, Ed Fong – WB6IQN