

Attachment No. 16



Tuesday, August 2, 2022
Today's eEdition

The Modesto Bee

77°F 88° 69°

News Local Sports Opinion California • Biz Beat Obituaries Jobs/Recruiting Personal Fi

OPINION AND COMMENTARY

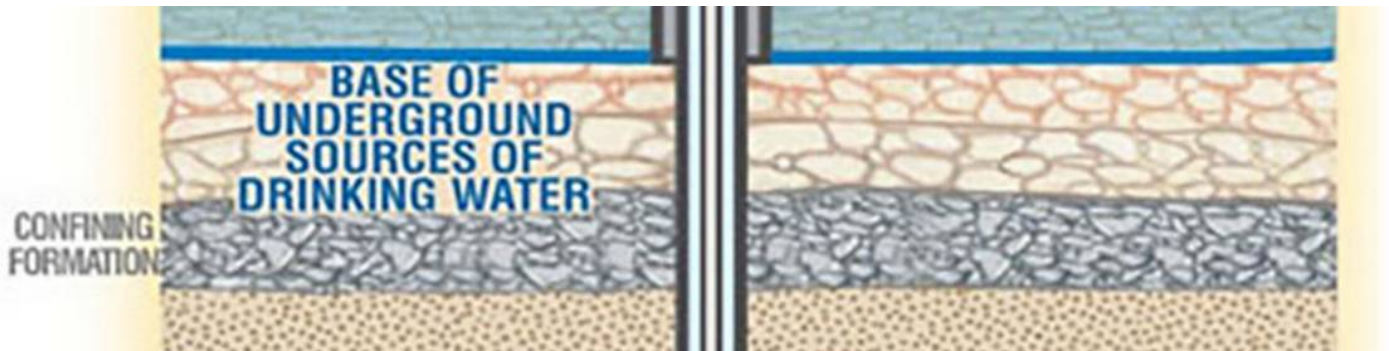
Editorials and other Opinion content offer perspectives on issues important to our community and are independent from the work of our newsroom reporters.

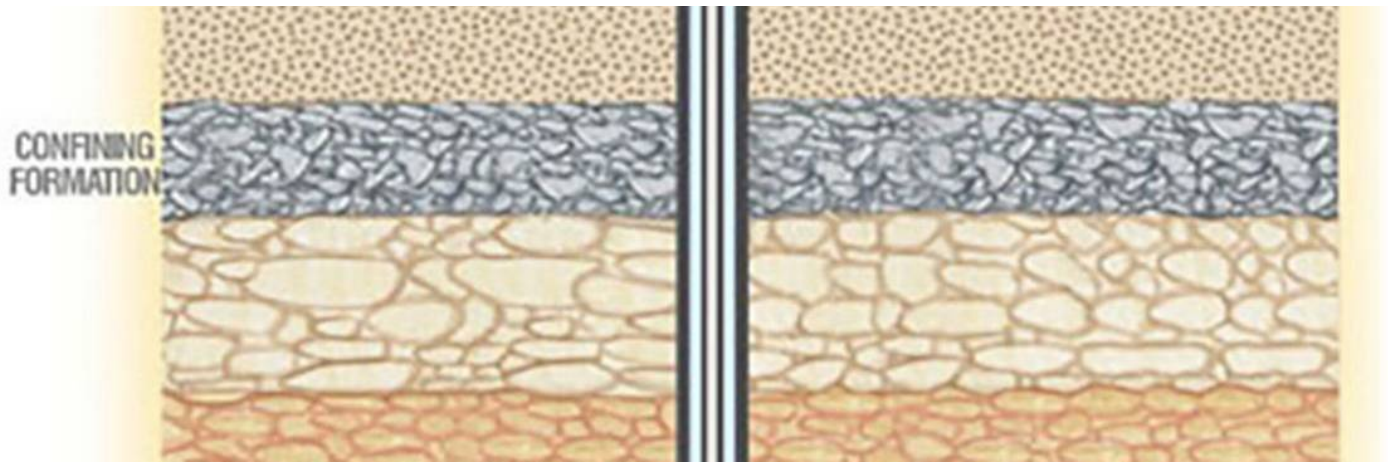
OPINION COLUMNS & BLOGS

Modesto expert: This sounds like an eco-friendly solution, but it's really a bad idea

BY VANCE KENNEDY SPECIAL TO THE MODESTO BEE

JULY 31, 2022 5:00 AM





Injecting carbon dioxide underground, as shown here in a conceptual design, is a bad idea, says Modesto's Vance Kennedy. U.S. ENVIRONMENTAL PROTECTION AGENCY



Only have a minute? Listen instead

Powered by [Trinity Audio](#)

00:00

10 10 1.0x

03:39

Removing carbon dioxide from our air is a good idea, and something we should all take seriously. But the thought that you can somehow inject CO2 deep underground with no consequences of any kind is, well, a pipe dream.

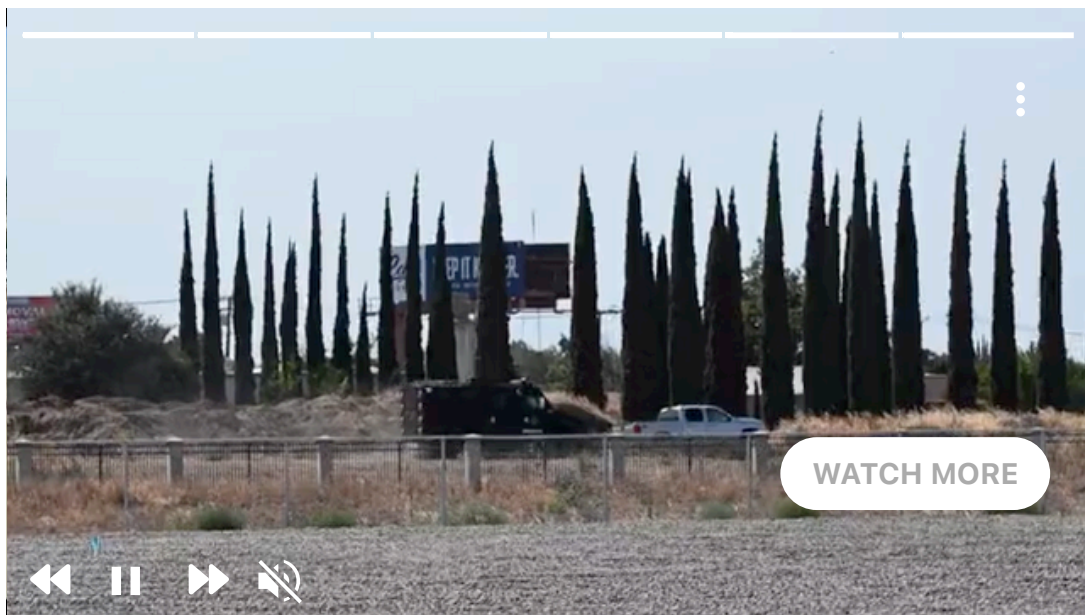
I read in [The Modesto Bee](#) that a company from Cupertino is requesting a federal permit to sink wells up to 8,000 feet beneath our Valley so that they can pump carbon dioxide removed from the atmosphere into the Earth.

That's a singularly bad idea.

I spent my career with the U.S. Geological Survey studying the Earth's geology and

Essential. Dependable. Local. **Subscribe for just \$3 for 3 months**

CLAIM OFFER



As regulators consider permitting wells to inject retrieved carbon dioxide underground, here are a few basic scientific facts they should keep in mind:

1. Earth beneath the Valley is made up of [many strata of shale](#), sand, gravels and, closer to the surface, some organic materials. Water fills in the many gaps between the sands and gravels in layers we call strata.
2. Deep beneath the Valley is a remnant of an [ancient, salty ocean](#) that millions of years ago covered the Valley floor. Closer to the surface is fresh water that has collected in the alluvial gravels and sands that washed down from Sierra mountains over many thousands (not millions) of years. Almost everyone in the Valley relies on this fresh water for drinking and growing things to eat.
3. [Carbon dioxide](#) is only very slightly soluble in water. That means however much carbon dioxide you pump into the crevices and gaps in the strata of the Earth, very, very little of it will be absorbed by the water into which it is injected. Instead, the water will be displaced, or simply pushed aside and upward.
4. [Water is incompressible](#), meaning unlike a gas, you can't force more of it into the same space where water is already existing. If you try, the original pool of water will simply be displaced. So, if you add insoluble carbon dioxide into vast pools of salty water deep underground, an equal amount of that salty water will be

displaced — moving up or sideways, wherever the path of least resistance allows it to go.

Get unlimited digital access

Subscribe now for just \$2 for 2 months.

CLAIM OFFER

These are basic facts. Knowing them, we can see that injecting carbon deep into ancient water beneath the surface will push some of this salty water into other spaces above. Eventually, this displaced salty water will find a pathway upward into our freshwater aquifers. When that happens, freshwater will be ruined.

You and I cannot drink salty water, and we can't grow food with it, either.

It should be noted that to pump CO₂, a gas, under ground it must be liquified under intense pressure to [negative-87 degrees](#), which would instantly freeze any water it contacts, blocking further injection.

Today's top headlines

Sign up for the Afternoon Newsletter and get the day's biggest stories in your inbox.

SIGN UP

This site is protected by reCAPTCHA and the Google Privacy Policy and Terms of Service apply.

What is being proposed here is similar to the fracking that oil companies are doing. And similarly, this fracking has ruined freshwater aquifers around the world, including in California, as demonstrated in a study done at [Stanford University](#) and

reported on extensively [in Scientific American](#), [Consumer Reports](#) and [NPR](#).

There are some good ideas emerging from the scientific community for removing carbon dioxide from the atmosphere, though the best solution is not to put it there to begin with. While I support finding ways to remove carbon dioxide from the atmosphere, once removed it must be disposed of carefully — not simply pumped below ground where it can ruin our aquifers. If we do that, we're just trading one problem for another.

Vance Kennedy lives in Modesto where he retired after 40 years with the U.S. Geological Survey, which bestowed upon him the Distinguished Service Award.

RELATED STORIES FROM MODESTO BEE

AGRICULTURE

Storing carbon a mile and a half beneath Stanislaus County could help save the planet

JULY 19, 2022 6:00 AM

GARTH STAPLEY

Central Valley wells are going dry in this drought. How to get free help

JULY 29, 2022 4:00 AM

Doctor Tells: Do You Have Too Much Belly Fat? (Eat This Before Bed)

Top US Doctor: Sugar Is Not The Problem (This Is)

GundryMD

Sponsored

Early Signs of Macular Degeneration You Might Want To Know About

Mac Degen | Search Ads | Sponsored

Keep Glasses Crystal Clear (No Cloth Required)

Peepeps™ | Sponsored

Learn More

San Jose: Unsold Never-Driven Cars Now Almost Being Given Away: See Prices

SUV Deals | Search Ads | Sponsored

New Shaftless Stair Lifts (Take a Look at the Prices)

Stair Lifts | Search Ads | Sponsored

Search Now

Empty Alaska Cruise Cabins Cost Almost Nothing

Alaska Cruise Deals | sponsored searches | Sponsored

56 Gloriously Awkward Photos Of Celebrities At Prom

Elle | Sponsored

The Best SUVs For Seniors

Senior Offers | Search Ads | Sponsored

Insane Things That Were Acceptable for Children in the 1960s

Country Living | Sponsored

Awkward Celebrity Prom Photos

Elle | Sponsored

The US States People Are Fleeing And The Ones They Are Moving To

Forbes | Sponsored

Luxury Electric Cars Are Now More Affordable Than Ever

Auto Savings Center | Search Ads | Sponsored

[Learn More](#)

35 Classic Photos From the Academy Awards

Good Housekeeping | Sponsored

What Causes Excessive Daytime Sleepiness? Some May Wish They Realized Sooner

Narcolepsy | Search Ads | Sponsored

Man found dead in canal by Virginia Corridor identified as Modesto resident

Modesto Bee

Another unnecessary death at the hands of impatient Modesto police

Modesto Bee

Old Hollywood Stars at Home

Elle Decor | Sponsored

Most Affordable Camper Vans

Camper Van Warehouse | Search Ads | Sponsored

San Jose: Unsold Never-Used Laptops Are Almost Being Given Away: See Prices

Laptop Deals | Search Ads | Sponsored

San Jose: Unsold Phones Are Almost Being Given Away

Cell Phone Deals | Sponsored Searches | Sponsored

The 25 Greatest Songs of All-Time

NewArena | Sponsored

[Read More](#)

Name released of Oakdale man who died in double fatal crash near Woodward Reservoir

Modesto Bee

No charges in death of Modesto worker. District attorney declines to prosecute

Modesto Bee

This article will change the way you buy glasses forever

We have changed the game when it comes to buying prescription eyewear, and our secrets have been uncovered

GlassesUSA.com | Sponsored

[Learn More](#)

Perfect Shave Without Irritation Or Cuts! The Trimmer Every Man Needs.

Luoccia | Sponsored

Shop Now

Locate Almost Anyone By Entering Their Name (This Is Addicting!)

TruthFinder | Sponsored

Take Us With You

Real-time updates and all local stories you want right in the palm of your hand.



MODESTO BEE APP →

VIEW NEWSLETTERS →

SUBSCRIPTIONS

Start a Subscription

Customer Service

eEdition

Vacation Hold

Pay Your Bill

LEARN MORE

About Us

Contact Us

Newsletters

Archives

Personal Finance

ADVERTISING

Advertising Information

Place An Obituary

Place a Classified Ad

Place a Newspaper Ad

COPYRIGHT

PRIVACY POLICY

TERMS OF SERVICE