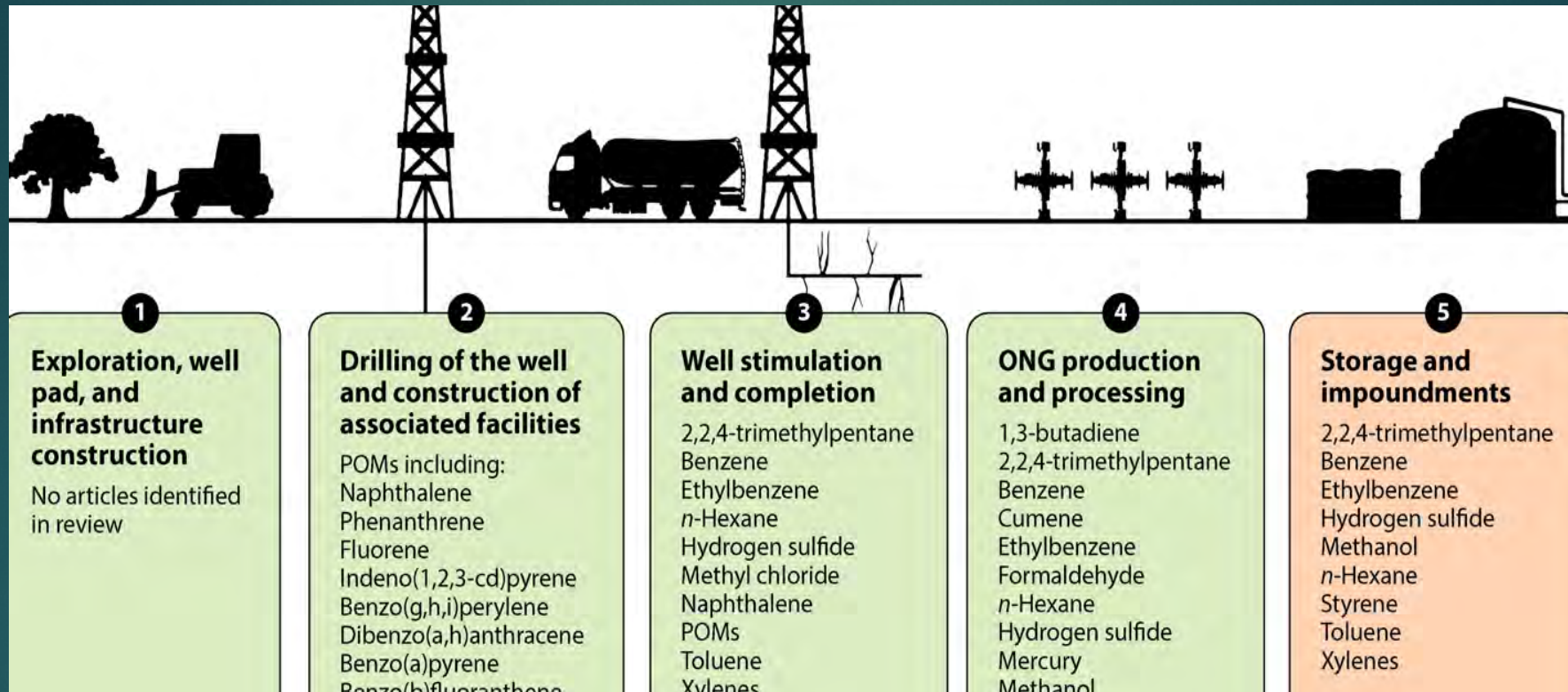




Potential environmental and health impacts of oil and gas exploration in East Contra Costa County

Jeffrey Mann, MD
Bret Andrews, MD

Hazardous materials associated with production of oil



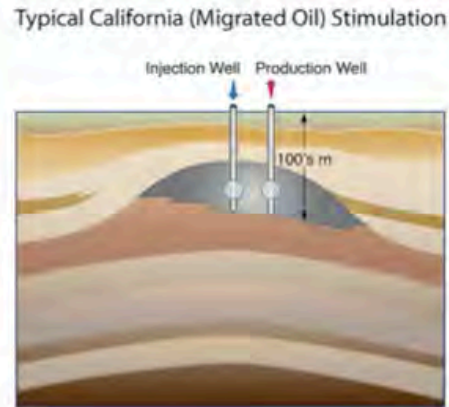
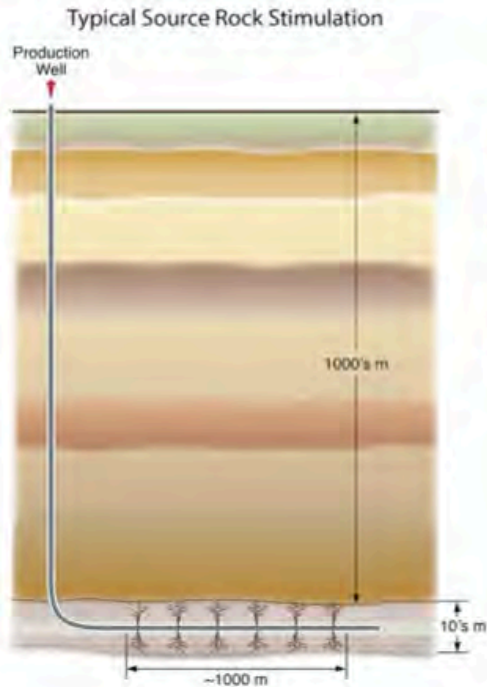
None of the 5 steps above are an accurate depiction of the PowerDrive proposal. This data is consistent with a high impact, multi stage fracking project. The author(s) clearly do not understand that oil wells are not all the same. They can be vastly different. Brentwood wells do not frack and virtually every chemical listed is frack related and not used in Brentwood. I am sure the authors have the best of intentions and are concerned about the health of the community, as am I, but they clearly do not have an understanding of the differences

Chemical usage in oil and gas extraction

- ▶ Many if not most oil and gas wells in CA use Enhanced oil recovery: involves water flooding, steam flooding, cyclic-steam injection
- ▶ Well stimulation: (hydraulic fracturing)

THE POWERDRIVE PROPOSAL WILL NOT USE ANY OF THE ENHANCED OIL RECOVERY METHODS LISTED ABOVE AND WILL NOT USE HYDRAULIC FRACTURING (FRACKING). THE USE PERMIT CAN SPECIFICALLY STATE THESE RESTRICTIONS. THE AUTHORS CLEARLY DON'T UNDERSTAND THE DIFFERENCES. THEY ARE OUT OF THEIR AREA OF EXPERTISE.

Extraction techniques in California

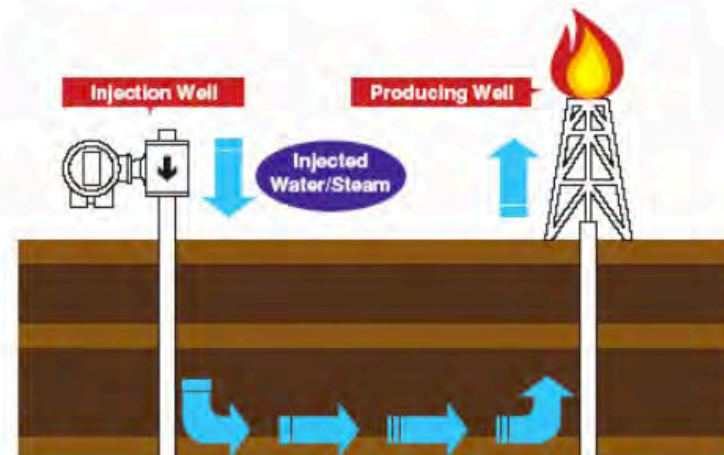


Well stimulation

(*hydraulic fracturing, and matrix acidizing, acid fracturing*)

Enhanced oil recovery, EOR

(*water flooding, steam flooding, cyclic steam injection*)



Again, nice presentation but completely irrelevant to the PowerDrive proposal as no Fracking or Enhanced recovery methods will be used. You cant just cut and paste what you find on the web and apply it to any and all oil projects. They can be vastly different.

Chemical usage in oil and gas development

- ▶ 500 chemicals have been reported by oil and gas operators
- ▶ Limited information on many of these chemicals makes it difficult to assess the public health risks
- ▶ Some chemicals can be reported as “trade secrets”
- ▶ Chemical use in oil and gas development is widespread and not restricted to well stimulation
- ▶ Summary: many chemicals are used, many unknown, difficult to know potential health risks of so many chemicals

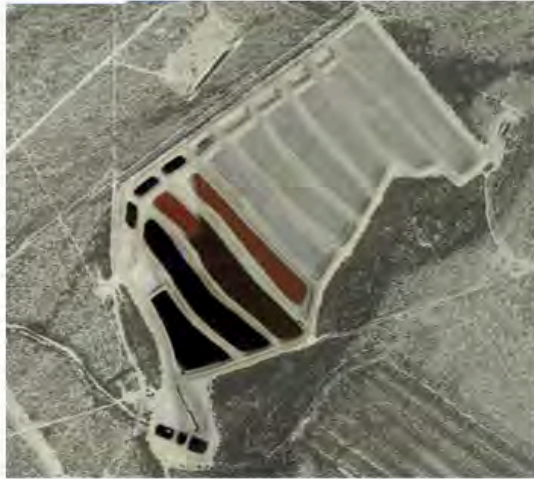
Again, irrelevant to the PowerDrive proposal. Brentwood oil is high gravity crude and requires no chemical stimulation to flow or to alter the viscosity. The above is basically a fracking description. Our project will use NONE of the above.

Produced water

- ▶ **Definition:** water co-produced with oil and gas development that can contain salts, petroleum hydrocarbons, microbes, chemical additives and byproducts.
- ▶ **Methods of disposal**

Again, lack of specific knowlegde to the Brentwood oil field. The produced water in Brentwood is Extremely fresh. It is one of the only areas in the entire state of California that was granted a surface Discharge permit and was allowed for over 20 years to drain the produced water into Sand Creek.

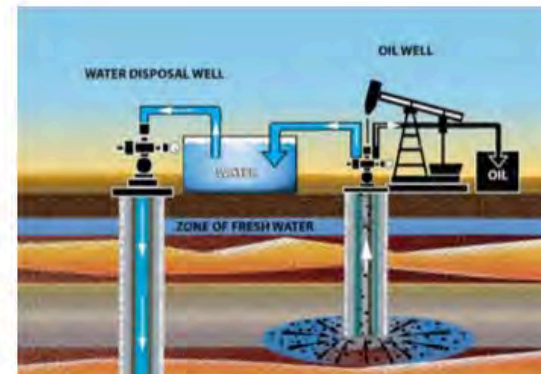
Oilfield wastewater disposal activities



Aerial image of McKittrick 1-1 from Geotracker

Unlined evaporation/percolation ponds – produced water percolates through soils to recharge aquifers with probable and confirmed groundwater contamination

Class II Underground Injection Control (UIC) – produced water is injected into aquifers for disposal



Again, complete lack of understanding of the Brentwood Oil Field. CCCo does not allow evaporation Or percolation ponds and historical water disposal has returned the produced water back into the Reservoir it came from AFTER removing the hydrocarbons so the reservoir is actually “refreshed”.

Our recommendations

- ▶ We are further recommending a minimum 2500 foot setback for any future oil and gas well drilling.

The 2,500' setback never made it out of committee this summer in Sacramento due, in part, to no scientific basis for the proposed setback

- ▶ Strongly consider a permanent moratorium on oil and gas well drilling in CCC

This would be inconsistent with State law and subject to litigation risk under Pre-emption. This was attempted in Monterey County and the County lost in court under Pre-emption.

Kaiser Hospital

**Proposed new PowerDrive oil well
~900 ft. from peoples' home**

Well site is 1,140' from nearest home not 900'

**Two recent wells (VG-3/4) and
a new well (VG-6)**

**Proposed PowerDrive Well
~900 ft. from homes**

**15 capped old oil wells underlying the Brentwood Hills subdivision
- CalGEM WellFinder**

