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# California Women in Energy

California Division of Oil, Gas, and Geothermal Resources

December 12, 2016

Sacramento, California

# Organization



Natural Resources Agency  
John Laird - Secretary



Department of Conservation  
David Bunn  
Director

Division of Oil, Gas, and Geothermal Resources  
Ken Harris  
Oil and Gas Supervisor



State Lands Commission

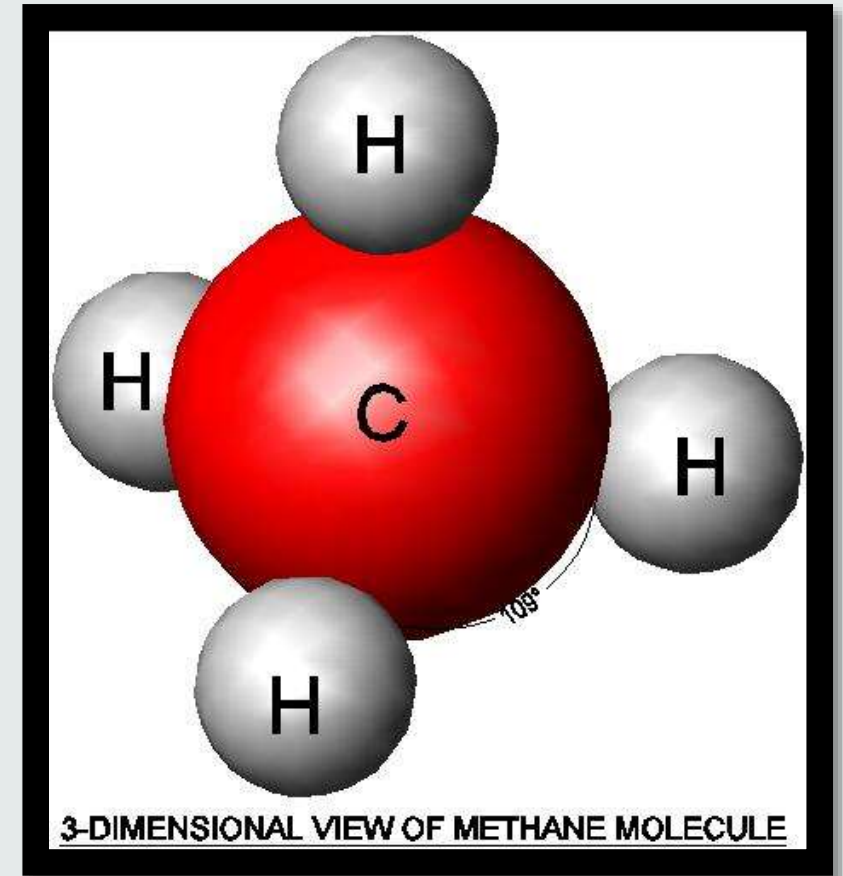
Department of Fish & Wildlife

Energy Commission



# What is Natural Gas?\*

- Colorless, shapeless and odorless gas
  - Mercapton added as an odorant to pipelines
- Hydrocarbon
  - Methane ( $\text{CH}_4$ ) 70-90% and a greenhouse gas
  - Ethane, propane and butane 0-20%
  - Carbon dioxide 0-8%
- Cleanest, safest and most useful fossil based gas



\*[www.naturalgas.org](http://www.naturalgas.org)



# History of Natural Gas in California

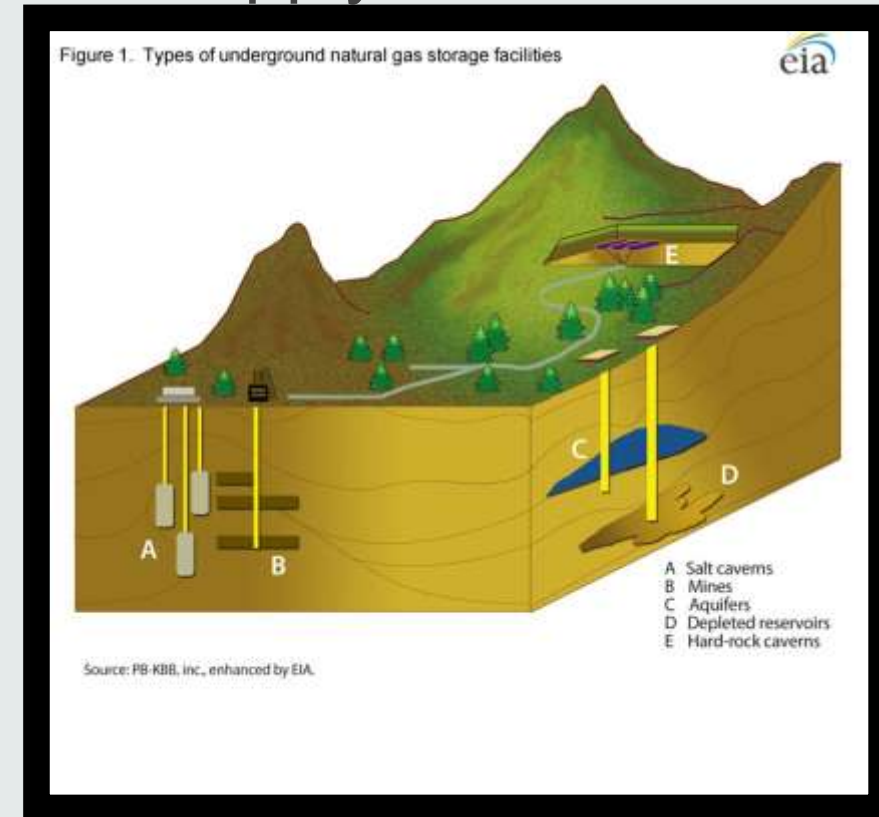
- 1887 1st gas well was a water well drilled in Stockton to 1002 feet
- 1907 1<sup>st</sup> gas supply by Santa Maria Gas Company
- 1915 Division of Oil and Gas formed
- 1926 1<sup>st</sup> natural gas well drilled in Buttonwillow
- 1929 1<sup>st</sup> law to conserve gas
- 1936 McDonald Island  
and Rio Vista gas discoveries
- 1950's 30 gas fields
- 1970's 74 gas fields



# Where Does the Gas Originate?

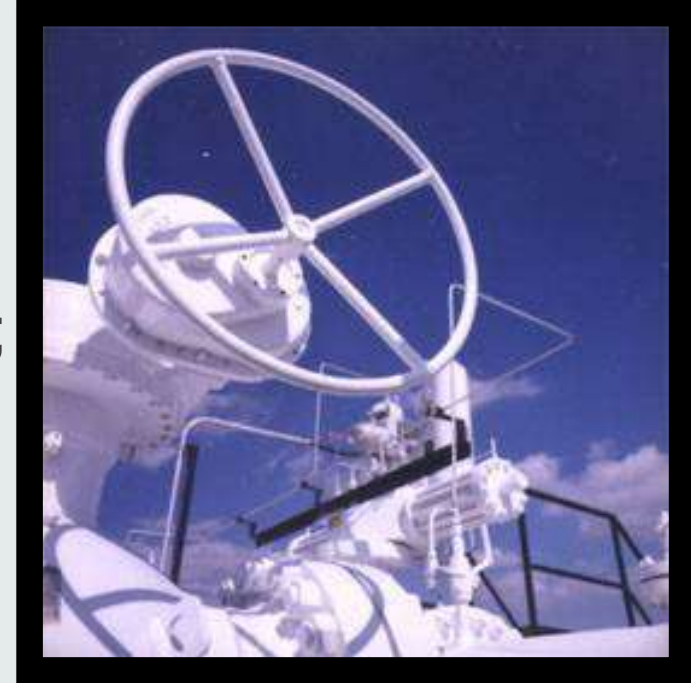
Since the 1940's California has had an inadequate supply

- 2012 data on gas supply source:
  - 75% from the Southwest and Rocky Mountains
  - 16% from Canada
  - 9% from California



# Why Natural Gas Storage?

- Two basic types of facilities:
  - Base load:
    - Long term Seasonal demand requirements:  
Natural gas is injected during the non-heating season;  
withdrawn during the heating season
  - Peak load:
    - Insurance against unforeseen supply disruptions.  
Designed to meet sudden, short-term demand increases.  
Turn over rates as short as a few days or weeks.



Expanded use of natural gas for electricity to replace coal has increased natural gas demand and need for storage.



# Agencies involved in Natural Gas and Natural Gas Storage

- Federal Energy Regulatory Commission
  - Interstate Oil and Gas Pipelines
- US Department of Transportation/  
Pipeline and Hazardous Materials Safety Administration
  - Interstate transport of natural gas and hazardous liquids
- CA Public Utilities Commission
  - Intrastate Natural Gas Pipelines
- State Fire Marshall
  - Intrastate Hazardous Liquid Pipelines



# Agencies involved in Natural Gas and Natural Gas Storage continued

- Division of Oil, Gas, and Geothermal Resources
  - Regulates oil, gas and injection wells (drilling, operations and maintenance) and in-lease pipelines and other facilities attendant to production.
    - PRC §3010, §3106, subdivision (a).
  - Memorandum of Agreement with CPUC: CPUC explicitly retain jurisdiction over pipelines associated with gas storage.



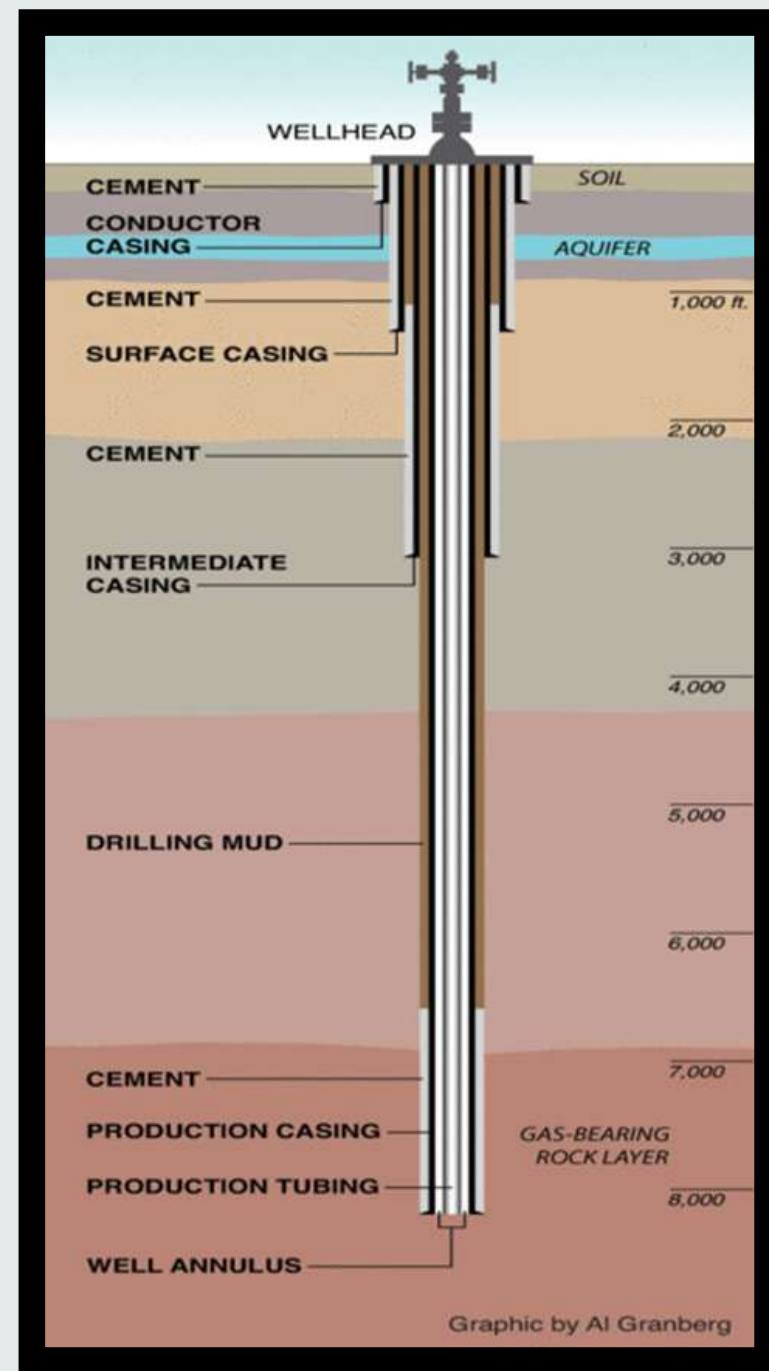


# Natural Gas Storage

• 1941 La Goleta	21.5 Billion cubic feet
• 1942 Playa Del Rey	2.4
• 1973 Aliso Canyon	86.0
• 1975 Honor Rancho	24.2
• 1976 McDonald Island	82.0
• 1979 Los Medanos	18.0
• 1979 Pleasant Creek	2.3
• 1997 Wild Goose	75.0
• 2001 Lodi	17.0
• 2010 Princeton	11.0
• 2010 Gill Ranch	<u>20.0</u>
<b>TOTAL</b>	<b>385.4</b>



# Well Casing Diagram



# Division Resources

- <http://www.conservation.ca.gov/dog>
- Well Finder  
<http://www.conservation.ca.gov/dog/Pages/Wellfinder.aspx>
- Underground Gas Storage  
<http://www.conservation.ca.gov/dog/Pages/UndergroundGasStorage.aspx>

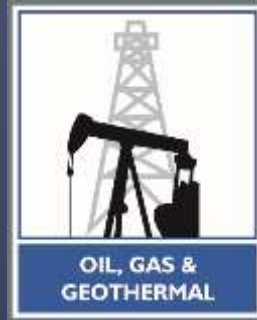




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