

Department of Conservation

Hydraulic Fracturing Workshop



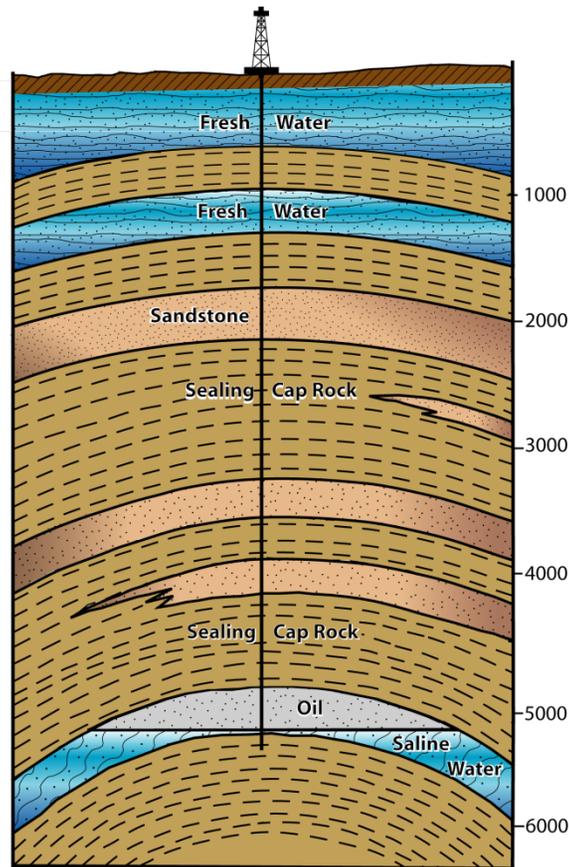
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- **Oil and Gas Production**
Geology- Oil and Gas Formations
- **State's Role in Oversight**
- **Hydraulic Fracturing**
- **Open discussion**

Send your comments to: comments@conservation.ca.gov

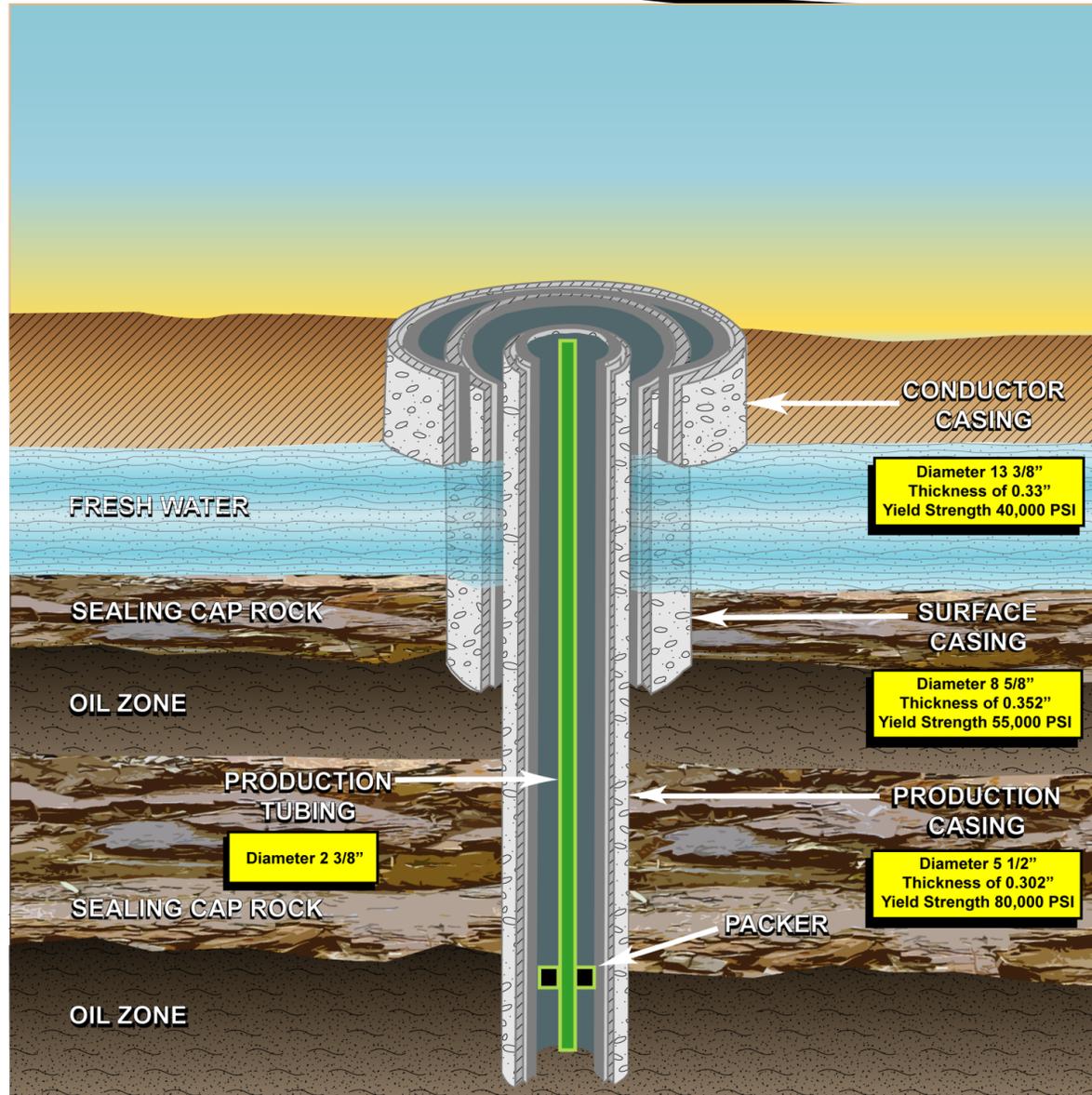
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Simplified Geology of Conventional Oil and Gas



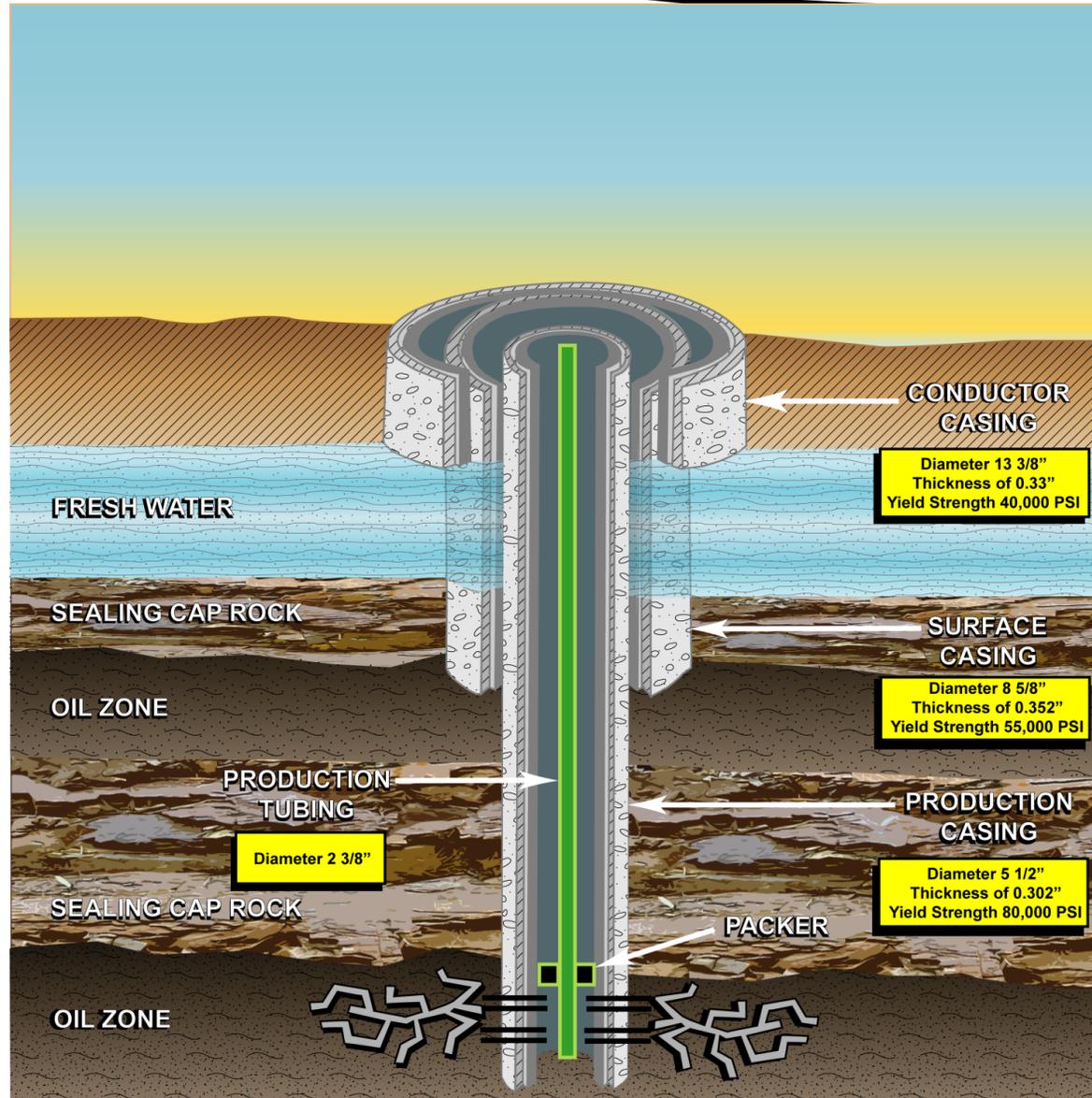
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Typical
Well Casing
(not to scale)



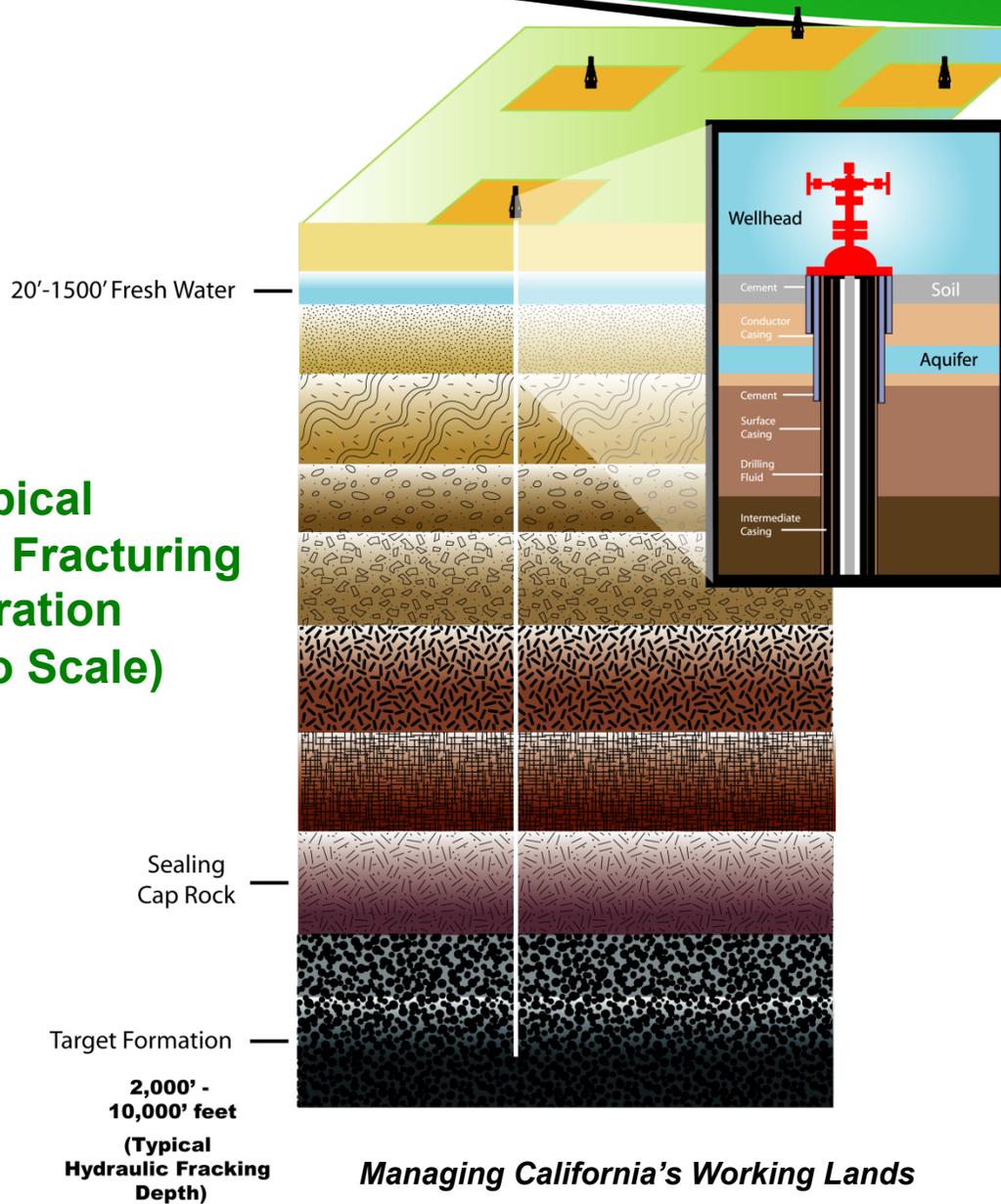
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Typical
Well Casing
with Packer and
Fracking
(not to scale)



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Typical Hydraulic Fracturing Operation (Not to Scale)



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The screenshot shows the Frac Focus website homepage. At the top left is the Frac Focus logo with the tagline "Chemical Disclosure Registry". A navigation menu includes: HYDRAULIC FRACTURING, GROUNDWATER, CHEMICAL, REGULATIONS, FIND A WELL, and FREQUENT. The main content area features a large "WELCOME" heading, a "LEARN MORE" button, and a "Looking for information about a well site near you?" section with a "FIND A WELL" button and a map of California. Below this is an "FAQs" section with a question: "How can my company become a FracFocus participating company and begin entering records?" and an answer: "To become a 'FracFocus' participating company please follow the instructions below: 1. Open the website www.fracfocus.org 2. Click on Register in the menu on the right hand side of the homepage 3. Complete the form and submit 4. Wait for a confirmation e-mail". At the bottom left, there is a section titled "Is groundwater protected?" with the text: "Groundwater Protection: Priority Number One. Oil and natural gas producers have stringent requirements for how wells must be completed. The greatest of these requirements is water safety. Casing is the first line of defense used to protect freshwater aquifers."



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Sample FracFocus Report

Hydraulic Fracturing Fluid Product Component Information Disclosure							
Last Fracture Date:	03/20/2012						
State:	California						
County:	Kern						
API Number:	04-030-46719						
Operator Name:	Vintage Prod Of Cal						
Well Name and Number:	Ware & Hauser 15-23W						
Longitude:	-119.68489						
Latitude:	35.39697						
Long/Lat Projection:	NAD83						
Production Type:	Oil						
True Vertical Depth (TVD):	7,000						
Total Water Volume (gal)*:	339,654						
Hydraulic Fracturing Fluid Composition:							
Trade Name	Supplier	Purpose	Ingredients	Chemical Abstract Service Number (CAS #)	Maximum Ingredient Concentration in Additive (% by mass)**	Maximum Ingredient Concentration in HF Fluid (% by mass)**	Comments
Water	Operator	Carrier	Water	7732-18-5	100.00%	87.75632%	
Alpha 125, 263 gal tote	Baker Hughes	Biocide	Glutaraldehyde	111-30-8	30.00%	0.00450%	SmartCare Product
GBW-5	Baker Hughes	Breaker	Ammonium Persulfate	7727-54-0	100.00%	0.00279%	SmartCare Product
Enzyme G-1	Baker Hughes	Breaker	Hemicellulase Enzyme Concentrate	9025-56-3	3.00%	0.00119%	SmartCare Product
High Perm CRB	Baker Hughes	Breaker	Water	7732-18-5	97.00%	0.03834%	
			Ammonium Persulfate	7727-54-0	60.00%	0.00186%	SmartCare Product
BC-3	Baker Hughes	Breaker Catalyst	Crystalline Silica Quartz	14808-60-7	30.00%	0.00093%	
			No Hazardous Ingredients	Trade Secret	100.00%	0.01318%	
BF-7L, Tote	Baker Hughes	Buffer	Potassium Carbonate	584-08-7	60.00%	0.03290%	SmartCare Product
			Potassium Hydroxide	1310-58-3	1.00%	0.00055%	
			Water	7732-18-5	60.00%	0.03290%	
BF-7L	Baker Hughes	Buffer	Potassium Carbonate	584-08-7	60.00%	0.01575%	SmartCare Product
			Potassium Hydroxide	1310-58-3	1.00%	0.00029%	
			Water	7732-18-5	60.00%	0.01575%	
Clay Master-5C (Tote)	Baker Hughes	Clay Control	Oxalkylated Amine Quat	138879-94-4	60.00%	0.06237%	
FRW-18	Baker Hughes	Friction Reducer	Petroleum Distillates	64742-47-8	30.00%	0.00764%	SmartCare Product
GW-3LDF	Baker Hughes	Gelling Agent	Acyclic Hydrocarbon Blend	Trade Secret	60.00%	0.18736%	SmartCare Product
			Alcohols, C12-14, Ethoxylated Propoxylated	68439-51-0	5.00%	0.01561%	
			Crystalline Silica, Quartz	14808-60-7	5.00%	0.01561%	
			Guar Gum	9000-30-0	60.00%	0.18736%	
Sand, White, 40/70	Baker Hughes	Proppant	Crystalline Silica (Quartz)	14808-60-7	100.00%	0.99471%	
Sand, White, 100 mesh	Baker Hughes	Proppant	Crystalline Silica (Quartz)	14808-60-7	100.00%	0.89865%	
Super LC, 30/50	Baker Hughes	Proppant	Hexamethylenetetramine	1009-7-0	0.01%	0.00092%	
			P/F Resin	9003-35-4	5.00%	0.45843%	
			Silicon Dioxide (Silica Sand)	14808-60-7	97.00%	8.89360%	
GasFlo G, 330 gal tote	Baker Hughes	Surfactant	Methanol	67-58-1	30.00%	0.05341%	SmartCare Product
			Mixture of Surfactants	Trade Secret	60.00%	0.10682%	
			Water	7732-18-5	50.00%	0.08901%	
Ingredients shown above are subject to 29 CFR 1910.1200 and appear on Material Safety Data Sheets (MSDS). Ingredients shown below are hazardous.							
			Acetyl Triethyl Citrate	77-89-4		0.013175449%	
			Cured Acrylic Resin	Trade Secret		0.0005296328%	
			Ethoxylated Alcohol	Trade Secret		0.0005093788%	
			Isotridecanol, Ethoxylated (TDA-6)	9043-30-5		0.0156135082%	
			Isotridecanol, Ethoxylated (TDA-9)	9043-30-5		0.0156135082%	
			Methanol	67-58-1		0.0003075153%	
			Poly (acrylamide-co-acrylic acid)	Trade Secret		0.0076406827%	
			Quaternary Ammonium Compounds bis[Hydrogenated Tallow Alkyl] Dimethyl Salts With Bentonite	68953-58-2		0.0156135082%	
			Salt	Trade Secret		0.0012734471%	
			Sorbitan Monooleate	Trade Secret		0.0012734471%	
			Water	7732-18-5		0.0396025696%	
* Total Water Volume sources may include fresh water, produced water, and/or recycled water							
** Information is based on the maximum potential for concentration and thus the total may be over 100%							
Ingredient information for chemicals subject to 29 CFR 1910.1200(i) and Appendix D are obtained from suppliers Material Safety Data Sheets (MSDS)							

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- **Definitions**
- **Well Construction Details**
- **Fracturing Details**
- **Reporting**

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