VIC1-330 Fracturing Operation

Pumping Truck

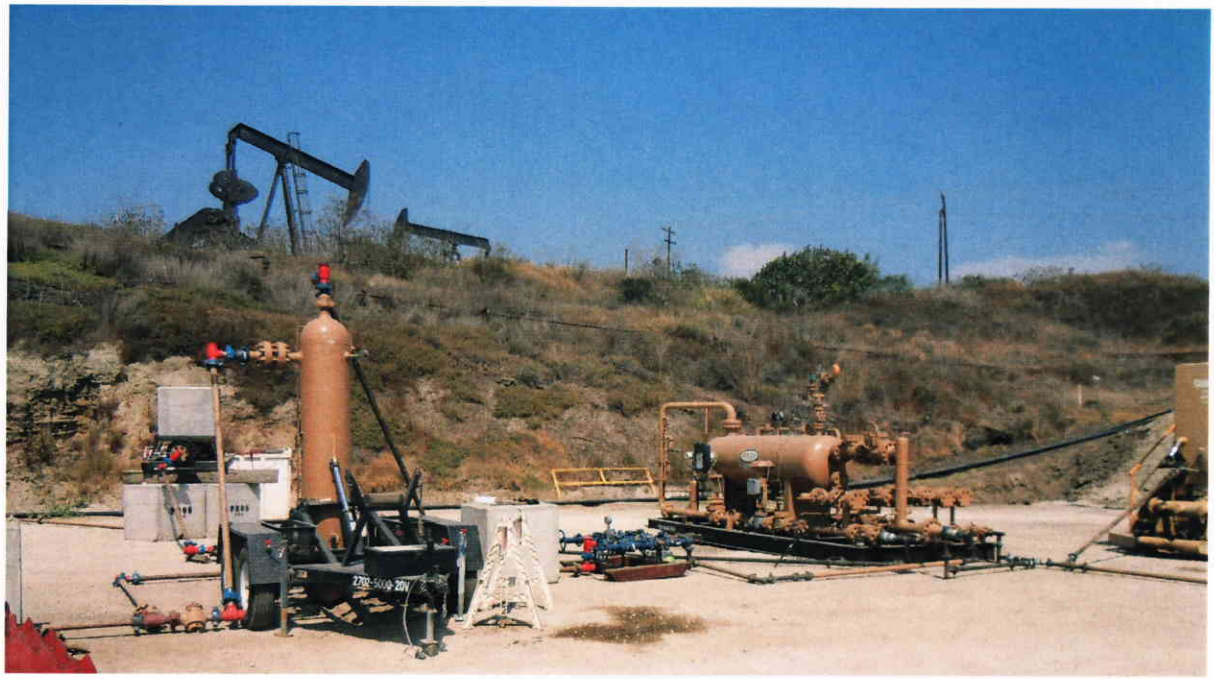
Piping Manifold and Blend Truck

Chemical Truck

Process Control Truck

Control Room

Well Head



Production Test Equipment

Surface Ground Motion Sensors

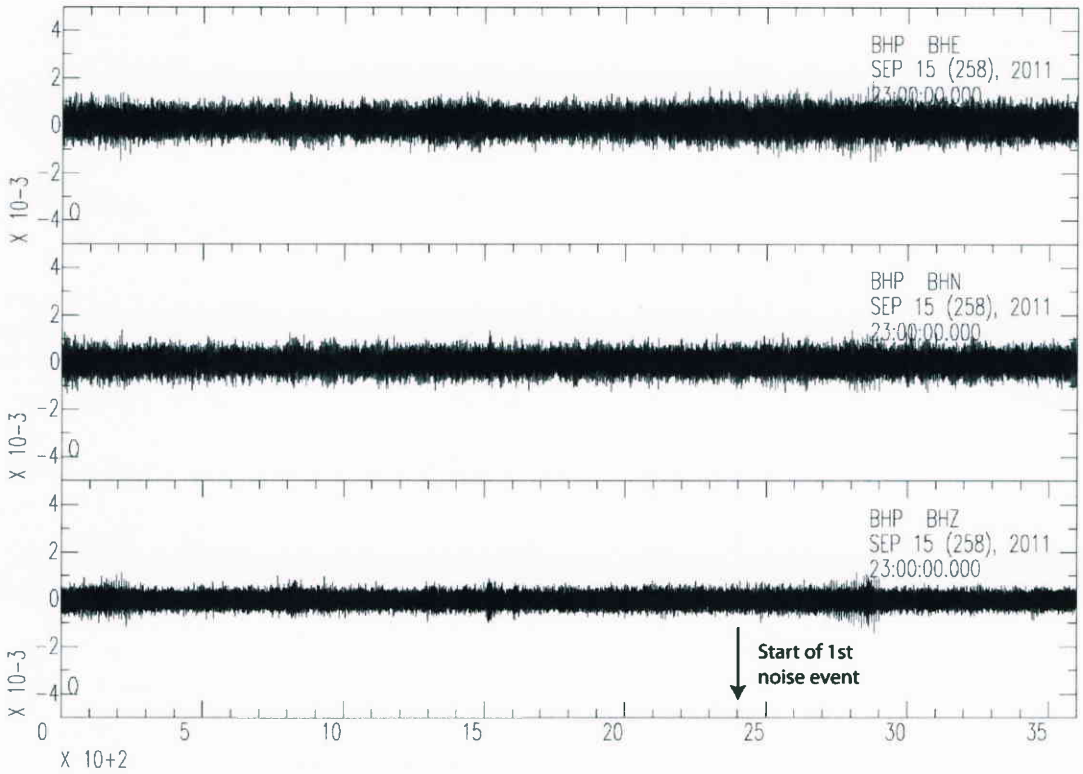
#3
1081'

#2
269'

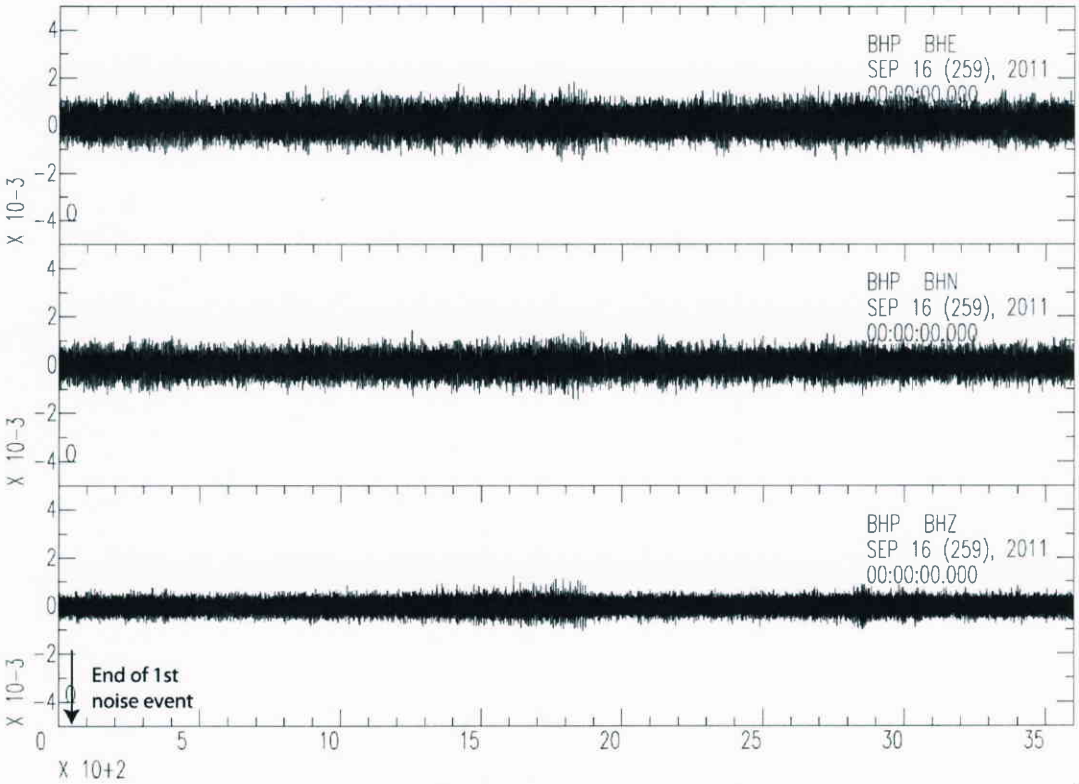
#1
142'

#4
847'

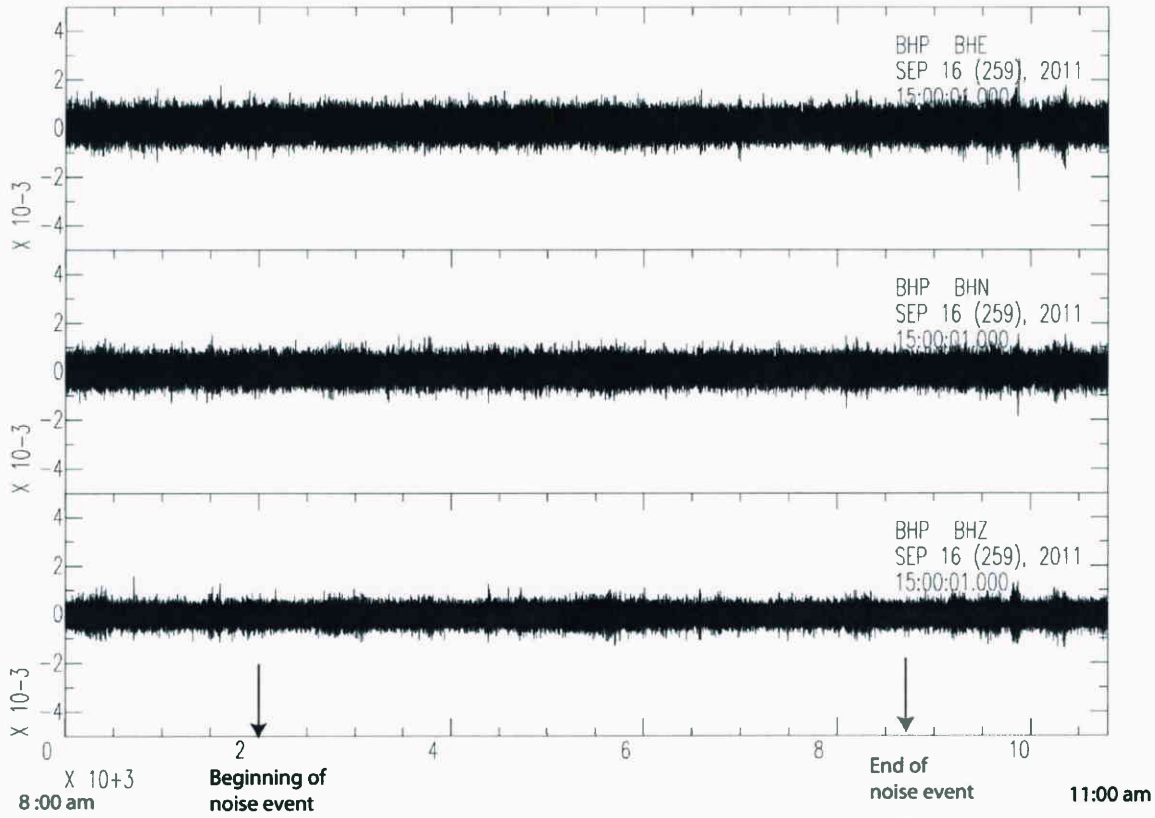
CalTech Accelerometer Monitoring



4:00 pm Seconds starting at 4 pm on Sept. 15th 5:00 pm



5 :00 pm Seconds starting at 5 pm on Sept. 15th 6:00 pm



Conclusions from CalTech

- **There were no noise signals above the local background during the fracturing operation.**
- **The fracturing activities were not putting much energy as shaking into the ground.**

Composition of Fracturing Additive for Inglewood VIC1-330

Common Name	Supplier Chemical Name	Common Description	Component listed on MSDS	Common Chemical Name	Purpose	Component Weight % of Chemical	Component loading gal/1000 gal	Gallons of Component	Weight of Component	Concentration Component of Total Fluid		
										by % Vol	by % Weight	ppm
Water		Water						168,210	1,401,189	99.4%	81.8%	994278
Biocide	BE-3S	Biocide			Eliminate Bacteria		0.15 ppt		30.00			
			2-Monobromo-3-nitrilopropionamide			1-5%					0.0001%	0.9
			2,2 Dibromo-3-nitrilopropionamide			60-100%					0.0018%	17.5
Liquid Gel Concentrate	LGC-36 UC	Gelling Agent			Adds Viscosity		6.0 gpt	515				
			Guar Gum	Polyscharide or Long chain made of sugars		30-60%			2317.50		0.135%	1353.1
			Naphtha, hydrotreated heavy			30-60%				0.183%		1826.5
Breaker	SP Breaker	Gel Breaker			Reduces Viscosity		0 - 1.0 ppt					
			Sodium Persulfate			60-100%			40		0.002%	23.4
Breaker	OptiFlo III	Gel Breaker			Reduces Viscosity		1.0 - 2.0 ppt					
			Ammonium Persulfate			60-100%			150		0.009%	87.6
			Crystalline Silica	Beach Sand		10-30%					0.003%	26.3
Friction Reducer	FR-66	Friction Reducer			Reduces pipe friction		1.0 gpt	85				
			Hydrotreated Light Petroleum Distillate			10-30%				0.015%		150.7
Crosslinker	K-38	Crosslinker			Increases Viscosity		0.6 ppt					
			Disodium Octoborate Tetrahydrate			60-100%			32		0.002%	18.7
Crosslinker	CL-28M	Crosslinker			Increases Viscosity		1.2 gpt	80				
			Borate Salts			30-60%					0.003%	28.0
			Crystalline Silica	Beach Sand		5%					0.000%	2.3
Acid	Fe-1A	Acid			Lowers pH		0.25 gpt	8				
			Acetic Anhydrite			60-100%					0.000%	4.7
			Acetic Acid			30-60%					0.000%	2.8
Buffer	BA-40L	Buffer			pH Buffer		1.0 gpt	90				
			Potassium Carbonate			30-60%				0.032%		319.2
Buffer	MO-67	Caustic			pH Buffer		0.2 gpt	15				
			Sodium Hydroxide	Caustic soda or lye		10-30%				0.003%		26.6
Surfactant	Losurf-300M	Surfactant			Aids in fluid recovery		1.0 gpt	175				
			Ethanol	Grain alcohol or Drinking alcohol (spirits)		30-60%				0.062%		620.6
			Poly(oxy-1,2-ethanediyl), alpha-(4-nonylphenyl)-omega-hydroxy-, branched			5-10%				0.010%		103.4
			Naphthalene	Mothball Crystals		0 - 1%				0.001%		10.3
			1,2,4 Trimethylbenzene	Aromatic or Cylic Hydrocarbon		0 - 1%				0.001%		10.3
			Heavy aromatic petroleum naphtha	Petroluem Distillate		10 - 30%				0.031%		310.3
KCL	KCL	Potassium Chloride	7%	Muriate of potash (fertilizer)	Clay control		585 ppt		98000		5.72%	57217.6
PRC Sand	Proppant	Quartz		Beach sand	Holds open fracture		2.0 - 6.0 ppg		145000		8.5%	84658.8
100 mesh Sand	Proppant	Quartz		Beach sand	Holds open fracture		0.5 ppg		6000		0.4%	3503.1
Sand	Proppant	Quartz		Beach sand	Holds open fracture		0.5 - 2.0 ppg		60000		3.5%	35031.2
							Total	169,178	1,712,759	100%	100%	

ppt-pounds thousand gallons; gpt-gallons per thousand gallons; ppg-pounds per gallon