

# SAN RAFAEL ROCK QUARRY VIBRATION REPORT

Location: PB-7.5      Max. Charge Weight: 160      Date of Blast: 6.3.14  
 Northing: 37° 59' 12 N      Blast Duration: 604 ms      Time of Blast: 11:34  
 Easting: 122° 27' 09 W      Blast Number: 1609

Seismograph Model	2000	Micro	Micro	Micro
Serial Number	2481	4550	4567	4570
Last Calibration Date	5 7 14	5 7 14	5 7 14	5 7 14

Location	Marin Co.	Via Montaballo	San Marino Dr	Mt New Park
Northing	37° 59' 19 N	37° 59' 18 N	37° 59' 31 W	37° 59' 30 N
Easting	122° 27' 21 W	122° 27' 53 W	122° 27' 30 W	122° 27' 16 W
Distance from Blast	1320	3590	2640	1900
Scaled Distance	104	283	208	150

Longitudinal Peak Particle Velocity (ips)	/	/	/	/
Longitudinal Peak Frequency (Hz)			.05	
Transverse Peak Particle Velocity (ips)	/	/	/	/
Transverse Peak Frequency (Hz)			.04	
Vertical Peak Particle Velocity (ips)	/	/	3.6	/
Vertical Peak Frequency (Hz)			.05	.8
Peak Vector Sum (ips)	0	0	.07	0
Peak Air Overpressure (db)			106	

**GENERAL COMMENTS:**  
 \_\_\_\_\_  
 \_\_\_\_\_  
 \_\_\_\_\_

Seismograph Operator: Ryan Lopez      Signature: [Signature]

# SAN RAFAEL ROCK QUARRY BLAST REPORT

**BASE DATA:**

Location: PB-2.5      Date: 6.3.14  
 Northing: 37°59'12N      Time: 11:34  
 Easting: 122°27'09W      Blast Number: 1609

**DESIGN DATA:**

Number of Holes Shot: 48      Hole Dia. (in.): 6 3/4      Loading Time Required (man hrs): 9      Deck Type: —  
 Ave. Hole Depth (ft): 25      Burden (ft): 14      Stem Type: 3A Stwc      Staggered Pattern (y or n): N      Length (ft): —  
 Relative Confinement: -      Spacing (ft): 15      Subdrill (ft): 5      Number of Lost Holes: 0      Tons Shot: 16650

**EXPLOSIVES DATA:**

Bulk Explosive	Weight	Boosters	Units	Delays	Misc.	Units	Max (lb/hole):
<u>Praxair 1000</u>	<u>6840</u>	<u>450 gram</u>	<u>96</u>	<u>80'22</u>	<u>—</u>	<u>48</u>	<u>160</u>
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>50'22</u>	<u>—</u>	<u>48</u>	<u>Blast Duration (sec): 604ms</u>
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>42ms</u>	<u>—</u>	<u>13</u>	<u>—</u>
<u>—</u>	<u>—</u>	<u>—</u>	<u>—</u>	<u>17ms</u>	<u>—</u>	<u>1</u>	<u>Total Charge Wt.: 6976</u>

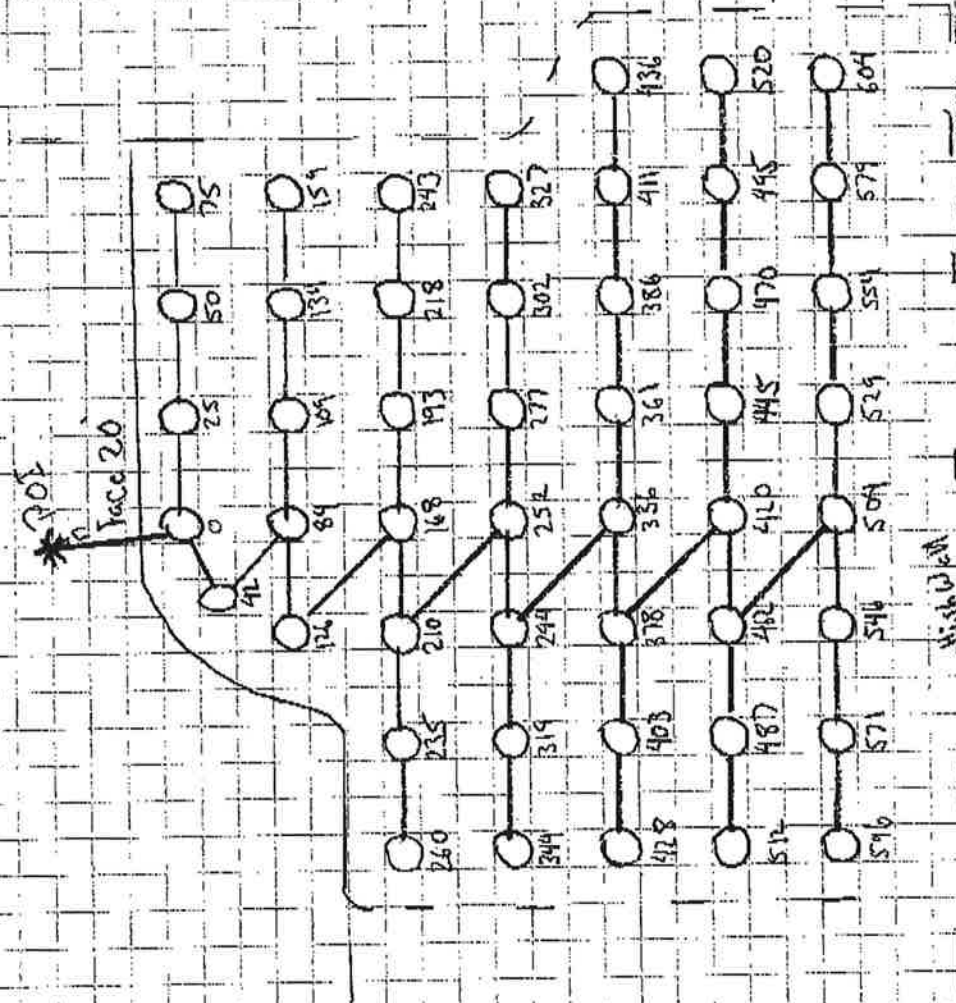
**VIBRATION DATA:**

Nearest Structure: Mgmt Bldg      Seismograph Loc.: Scsm      Temperature: 62°      Max. Chrg. (lb/8ms): 160  
 Northing: 37°59'17N      Northing: —      Sky Condition: Clear      RPPV: .07  
 Easting: 122°27'22W      Easting: —      Wind Direction: SE      Frequency: 3.6  
 Distance Away: —      Distance Away: —      Wind Speed: 3-5      Airblast: 106

**PERFORMANCE DATA:**

Powder Factor (lb/ton): 4      Displacement: 50'      Crushability: —  
 Lib/yard<sup>3</sup>: 1.03      Vibration: Rock      Fines: —  
 Fragmentation: 50%      Dig ability: —  
 Comments: —      Blaster in Charge: Phuyun

634  
 P.B. 75  
 #1609



Main 1320  
 V.M. 3590  
 Span M 2640  
 M<sup>1</sup>W 1900  
 37° 59' 12" W  
 122° 27' 09" W

Depth 25'  
 13 stems  
 160 lbs per Max

48 Holes  
 48 = 80' E Z  
 48 = 50' E Z  
 13 = 42 m  
 1 = 17 m  
 96 = 450 gsm  
 6 840 lbs T<sup>1</sup> tan

Ramp to half Bench

# Seismic Analysis

## Velocity Waveform Analysis

**Serial Number:** 9668  
**Firmware Version:** 0C-05.18  
**Event Date:** 06/03/2014 11:30:51 (UTC -07:00)  
**Event number:** 2  
**Recording Time:** 5 s  
**Client:** COUNTY OF MARIN  
**Operation:** SAN RAFAEL ROCK QUARRY  
**Location:** ON QUARRY PROPERTY  
**Distance:**  
**Operator:** VIBRA-TECH IP2  
**Comment:**  
**Seismic Trigger:** 0.03 in/s  
**Sound Trigger:** OFF

**Additional Info:**

j-GEO-01253  
 N37 59.481, W122 27.256

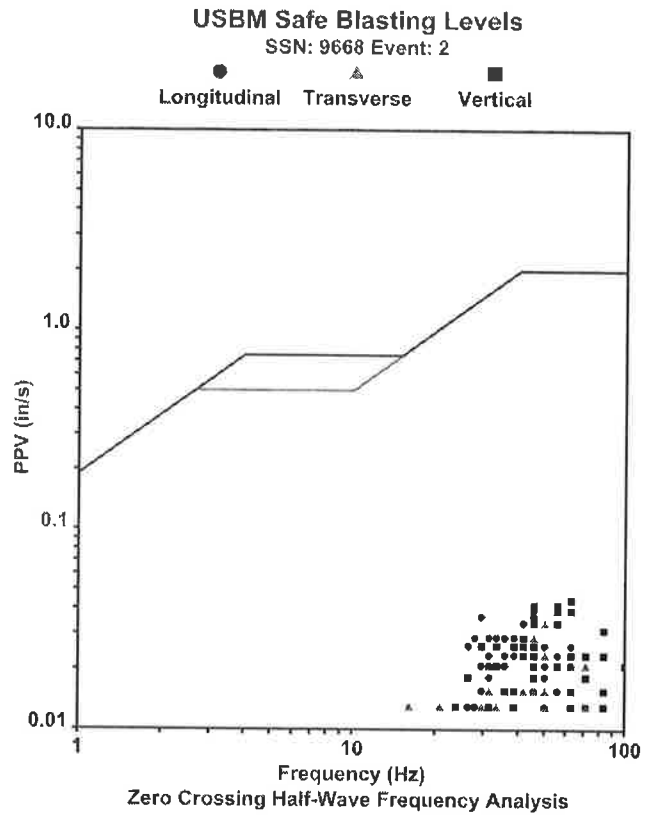
**Summary Data**

	L	T	V
<b>PPV (in/s):</b>	0.0375	0.0325	0.0425
<b>FREQ (HZ):</b>	45.5	50	62.5
<b>PD (.001"):</b>	0.1775	0.1775	0.185
<b>PPA (g):</b>	0.04557	0.02604	0.04557

**Peak Vector Sum:** 0.0525 in/s  
**Peak Air Pressure:** 100.5 dB  
 0.0003208 psi @ 3.3 HZ

**Shaketable Calibrated**

**On:** 01/29/2014 (UTC -07:00)  
**By:** Vibra-Tech, Inc.  
 2700 Holloway Road - Suite 113  
 Louisville, KY 40203 U.S.A.

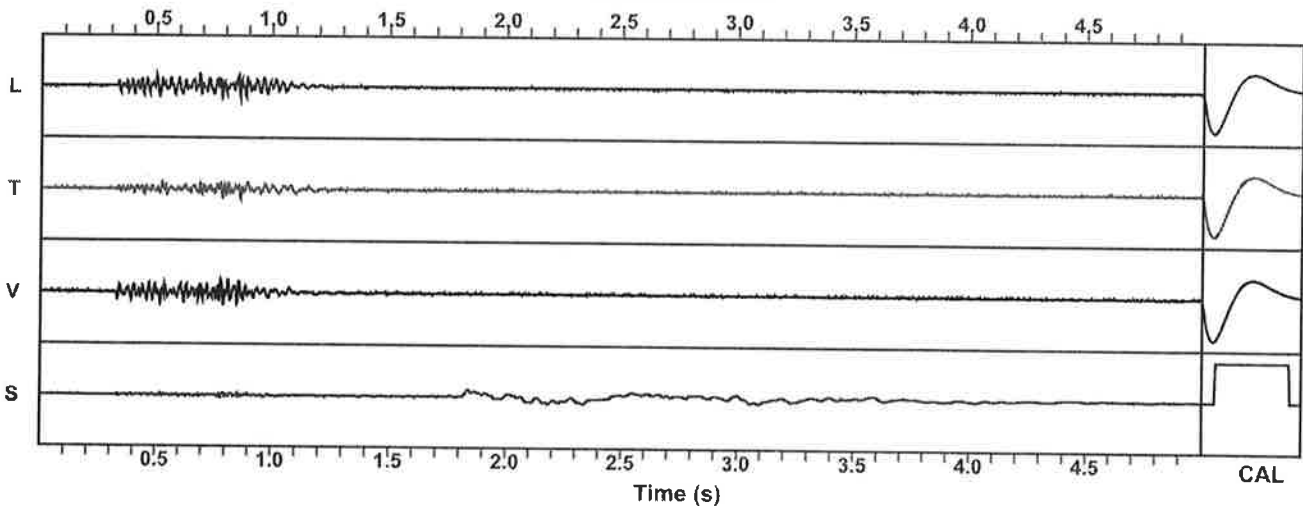


**Waveform Graph Scale**

**Time Scale:** 0.1 s  
**Seismic Scale:** +/- 0.16 in/s  
**Sound Scale:** +/- 0.0023 psi

### Velocity Waveform

SSN: 9668 Event: 2



# GeoSonics Inc. Seismic Analysis

## Stop Event Report

**Serial No:** 8154 v5.11  
**Client:** COUNTY OF MARIN  
**Operation:** SAN RAFAEL ROCK QUARRY  
**Location:** 16 MARIN BAY PARK CT.  
**Distance:**  
**Operator:** VIBRA-TECH IP2  
**Comment:** WILLIAM HOSKEN RES.

**Begin Date:** 06/03/2014 07:00:47 (UTC-7)  
**End Date:** 06/03/2014 12:27:44 (UTC-7)  
**Events over Trigger:** 0 (110-109)  
**Record Time:** 5.0 s  
**Seismic Trigger:** 0.030 in/s  
**Sound Trigger:** N/A  
**Battery Level:** 8.3

### Additional Info:

j-GEO-01252  
N37 59.524, W122 27.373

**Shaketable Calibrated:** 01/23/2014  
**By:** Vibra-Tech, Inc.  
2700 Holloway Road - Suite 113  
Louisville, KY 40299 U.S.A.  
TEL: 502.240.9900 FAX: 502.240.9902

### Dynamic Calibration Graph:



### Cal Test Results:

<b>Longitudinal:</b>	<b>Pass</b>
<b>Transverse:</b>	<b>Pass</b>
<b>Vertical:</b>	<b>Pass</b>
<b>Sound:</b>	<b>Pass</b>

The seismograph located at 16 Marin Bay Park Court (S/N 8154) did not trigger during the shot on June 3, 2014 at approximately 11:30 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.