

SAN RAFAEL ROCK QUARRY BLAST REPORT

BASE DATA

Location: PB-7 Designed Bench Height (ft): 40 Date: 9.7.12
 Northing: 37° 59' 12 N Rock Density (lb/ft³): 2.33 Time: 11:33
 Easting: 122 27 12 W Relative Rock Hardness: 7 Blast Number: 1586

DESIGN DATA

Number of Holes Shot: 24 Hole Dia. (in.): 6 3/4 Steaming (ft): 18 Loading Time Required (man hrs): 6 Deck Type: -
 Ave. Hole Depth (ft): 43 Burden (ft): 15 Stem Type: 3/4" Stone Staggered Pattern (y or n): N Length (ft): -
 Relative Confinement: - Spacing (ft): 15 Sub-drill (ft): 3 Number of Lost Holes: 0 Tons Shot: 9.034

EXPLOSIVES DATA

Bulk Explosive	Weight	Boosters	Units	Delays	Units	Misc.	Units	Max (lb/hole):
<u>Praxair 40</u>	<u>7.840</u>	<u>480</u>	<u>48</u>	<u>5022dt</u>	<u>24</u>			<u>400</u>
				<u>41AS</u>	<u>3</u>			
				<u>DMK</u>	<u>2</u>			
								<u>Blast Duration (sec): 30.145</u>
								<u>Total Charge Wt.: 9.886</u>

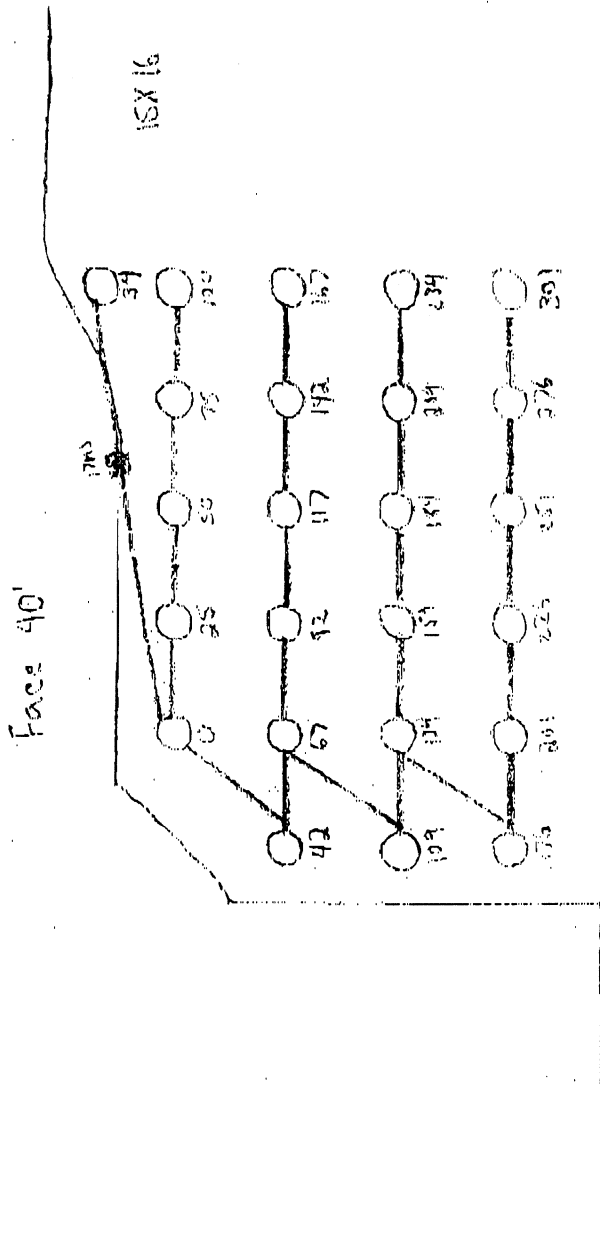
VIBRATION DATA

Nearest Structure: Praxair Seismograph Location: 60 ft Temperature: 28° Max. Chrg. (lb/8ms): 430
 Northing: 37° 59' 12 N Norming: - Sky Condition: Clear RPPV: 11
 Easting: 122 27 12 W Heading: - Wind Direction: SE 40° Frequency: 0.5
 Distance Away: 1000 Distance Away: - Wind Speed: 0 mph Airblast: 10

PERFORMANCE DATA

Powder Factor (lb/ton): 15 Displacement: 6000 Crushability: -
 Lb/ft³: 1.8 Vibration: 0.620 ft Fines: -
 Fragmentation: g/ft Dig ability: -
 Comments: Done by [Signature]

9.7.12
 PB.7
 #1526



105%
 2026
 207%
 1985
 30° 59' 12.4"
 121° 47' 12.4"

Depth 43ft
 440 lbs per
 400 lbs

69 Holes
 44: 30.82 det
 34: 30.82 det
 34: 2MS SZL
 2: 17MS 2.7L
 48: 450gms

9,840 lbs Titan

Seismic Analysis Velocity Waveform Analysis

Serial Number: 8030
Firmware Version: 08-03.23
Event Date: 09/07/2012 11:32:16 (UTC -07:00)
Event number: 7
Recording Time: 5 s
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: ON QUARRY PROPERTY
Distance:
Operator: VIBRA-TECH GSM
Comment:
Seismic Trigger: 0.03 in/s
Sound Trigger: 75.9 DB

Additional Info:
 j-GEO-01253
 N37 59.481, W122 27.256

Summary Data

	L	T	V
PPV (in/s):	0.0975	0.045	0.09
FREQ (HZ):	27.8	29.4	45.5
PD (.001"):	0.5275	0.74	0.595
PPA (g):	0.07812	0.03255	0.08464

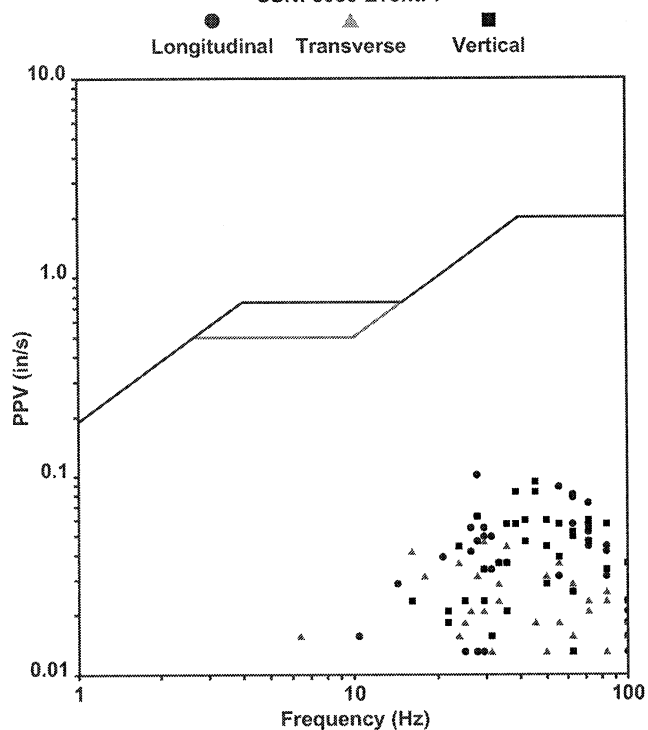
Peak Vector Sum: 0.115 in/s
Peak Air Pressure: 110.4 DB
 0.0009802 psi @ 3.4 HZ

Shaketable Calibrated

On: 05/14/2012 (UTC -07:00)
By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

USBM Safe Blasting Levels

SSN: 8030 Event: 7



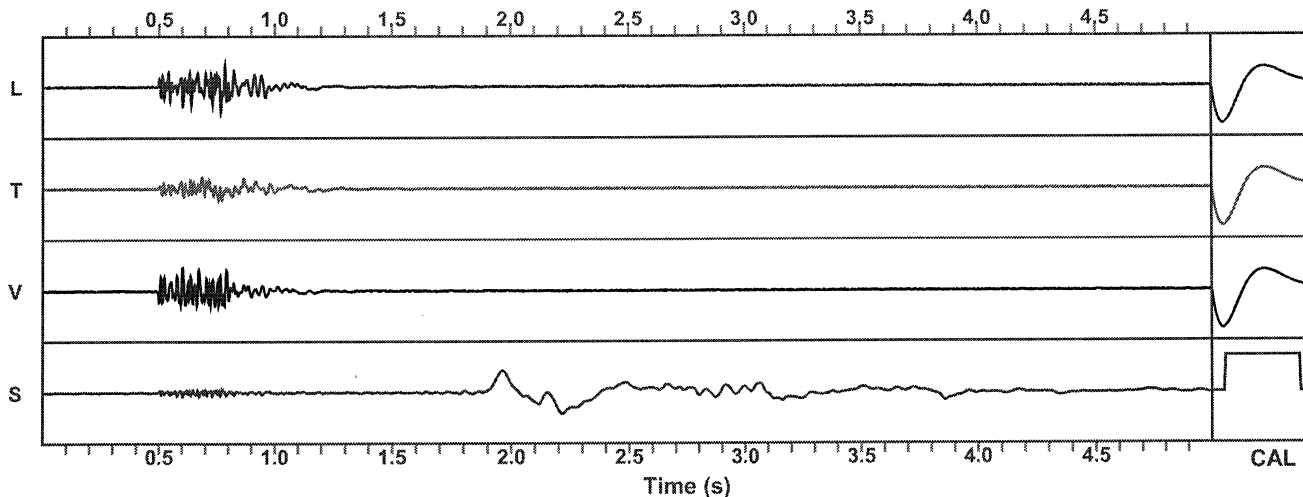
Zero Crossing Half-Wave Frequency Analysis

Waveform Graph Scale

Time Scale: 0.1 s
Seismic Scale: +/- 0.195 in/s
Sound Scale: +/- 0.0023 psi

Velocity Waveform

SSN: 8030 Event: 7



Seismic Analysis Velocity Waveform Analysis

Serial Number: 8056
Firmware Version: 08-03.23
Event Date: 09/07/2012 11:32:16 (UTC -07:00)
Event number: 5
Recording Time: 5 s
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: 16 MARIN BAY PARK CT.
Distance:
Operator: VIBRA-TECH GSM
Comment: WILLIAM HOSKEN RES.
Seismic Trigger: 0.03 in/s
Sound Trigger: 75.9 DB

Additional Info:
 j-GEO-01252
 N37 59.524, W122 27 373

Summary Data

	L	T	V
PPV (in/s):	0.0475	0.0325	0.0375
FREQ (HZ):	27.8	31.3	31.3
PD (.001"):	0.225	0.38	0.275
PPA (g):	0.03255	0.01953	0.04557

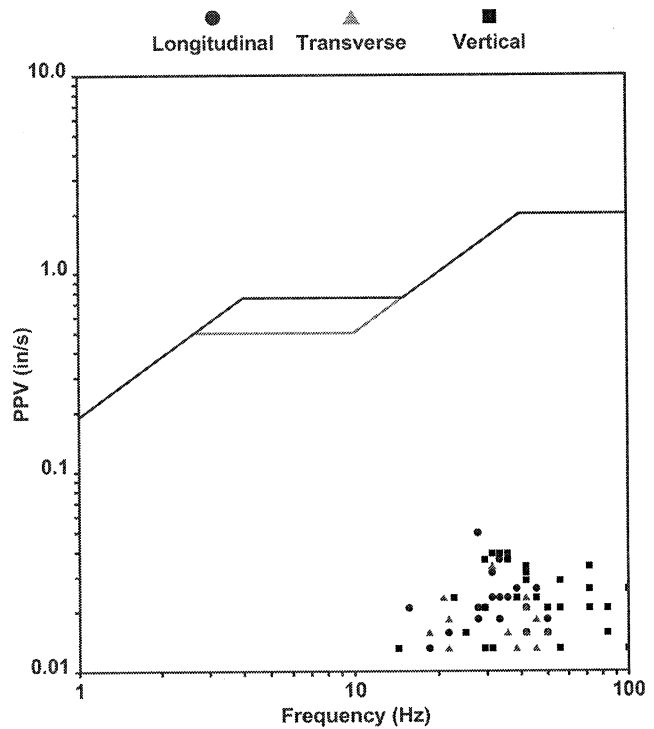
Peak Vector Sum: 0.0525 in/s
Peak Air Pressure: 110.4 DB
 0.0009802 psi @ 2.8 HZ

Shaketable Calibrated

On: 05/16/2012 (UTC -07:00)
By: Vibra-Tech, Inc.
 2700 Holloway Road - Suite 113
 Louisville, KY 40203 U.S.A.

USBM Safe Blasting Levels

SSN: 8056 Event: 5



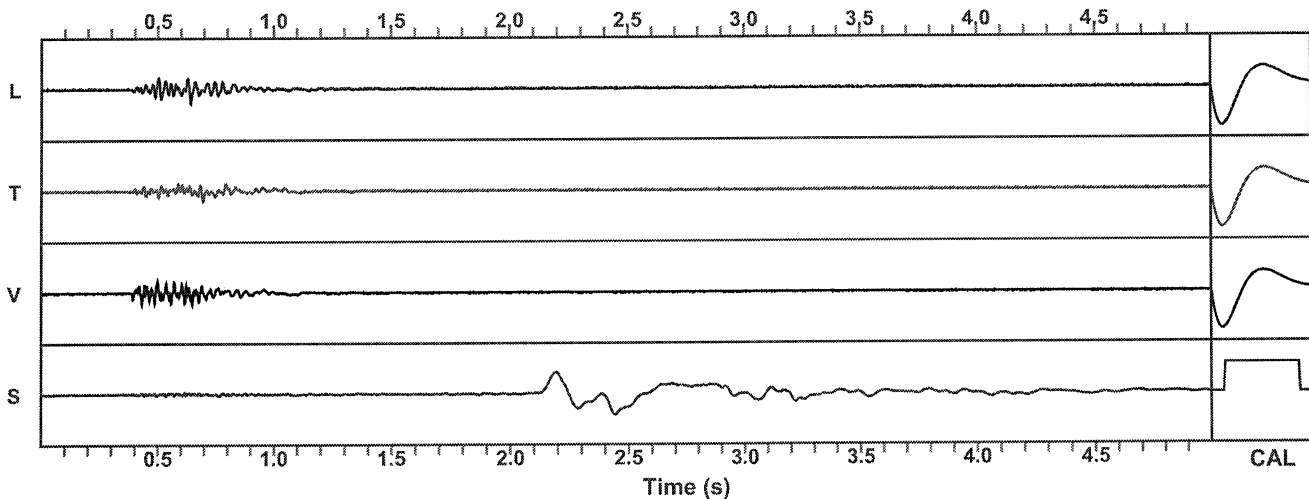
Zero Crossing Half-Wave Frequency Analysis

Waveform Graph Scale

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

Velocity Waveform

SSN: 8056 Event: 5



GeoSonics Inc. Seismic Analysis

Stop Event Report

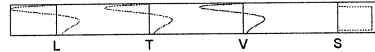
Serial No: 8021 v3.23
Client: COUNTY OF MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: 114 SAN MARINO DRIVE
Distance:
Operator: VIBRA-TECH GSM
Comment: VERONIQUE RASKIN*

Begin Date: 09/07/2012 06:00:50 (UTC-7)
End Date: 09/07/2012 12:31:49 (UTC-7)
Events over Trigger: 0 (16-15)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.8

Additional Info:
*RESIDENCE
j-GEO-01254
N37 59.395, W122 27.700

Shaketable Calibrated: 05/11/2012
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:

Longitudinal:	Pass
Transverse:	Pass
Vertical:	Pass
Sound:	Pass

The seismograph at 114 San Marino Drive (S/N 8021) did not trigger during the shot on September 7, 2012 at approximately 11:32 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.