# SAN RAFAEL ROCK QUARRY VIBRATION REPORT

**Location:** South Hill E175

**Max. Charge Weight:** 240

**Date of Blast:** 4/12/14

**NORTHING:** 37°59'02" N

**BLAST DURATION:** 504 ms

**EASTING:** 122°27'23" W

**TIME OF BLAST:** 12:02

**BLAST NUMBER:** 1547

<table>
<thead>
<tr>
<th>SEISMOGRAPH INFORMATION</th>
<th>UNIT #1</th>
<th>UNIT #2</th>
<th>UNIT #3</th>
<th>UNIT #4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Seismograph Model</td>
<td>9000</td>
<td>micro</td>
<td>micro</td>
<td>micro</td>
</tr>
<tr>
<td>Serial Number</td>
<td>9481</td>
<td>4650</td>
<td>4867</td>
<td>4570</td>
</tr>
<tr>
<td>Last Calibration Date</td>
<td>5/10/10</td>
<td>5/17/10</td>
<td>5/17/10</td>
<td>5/17/10</td>
</tr>
</tbody>
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</thead>
<tbody>
<tr>
<td>Location</td>
<td>Marin Ag</td>
<td>Via Mont</td>
<td>San Marina</td>
<td>McNear Park</td>
</tr>
<tr>
<td>Northing</td>
<td>37°59'19&quot; N</td>
<td>37°59'18&quot; N</td>
<td>37°59'31&quot; N</td>
<td>37°59'30&quot; N</td>
</tr>
<tr>
<td>EASTING</td>
<td>122°27'22&quot; W</td>
<td>122°27'53&quot; W</td>
<td>122°27'30&quot; W</td>
<td>122°27'16&quot; W</td>
</tr>
<tr>
<td>Distance from Blast</td>
<td>1742</td>
<td>2104</td>
<td>3010</td>
<td>2851</td>
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<tr>
<td>Longitudinal Peak Particle Velocity (ips)</td>
<td></td>
<td></td>
<td></td>
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<tr>
<td>Longitudinal Peak Frequency (Hz)</td>
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<tr>
<td>Transverse Peak Particle Velocity (ips)</td>
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</tr>
<tr>
<td>Transverse Peak Frequency (Hz)</td>
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<tr>
<td>Vertical Peak Particle Velocity (ips)</td>
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</tr>
<tr>
<td>Vertical Peak Frequency (Hz)</td>
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<tr>
<td>Peak Vector Sum (ips)</td>
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<tr>
<td>Peak Air Overpressure (db)</td>
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</tbody>
</table>

**GENERAL COMMENTS:**

Nothing triggered

Seismograph Operator: Deron Lopes

Signature: [Signature Image]
# SAN RAFAEL ROCK QUARRY BLAST REPORT

**BASE DATA:**
- Location: South Hill E1/26
- Northing: 32°59'02" N
- Easting: 122°27'23" W
- Designed Bench Height (ft): 25'
- Rock Density (lb/ft^3): 2.7
- Date: 4-12-11
- Time: 12:02
- Relative Rock Hardness: 7
- Blast Number: 1547

**DESIGN DATA:**
- Number of Holes Shot: 30
- Hole Dia. (in.): 6 3/4
- Stemming (ft): 1/4 Avs
- Loading Time Required (min hrs): 5
- Ave. Hole Depth (ft): 20
- Burden (ft): 13
- Stem Type: 3/4 Stone
- Deck Type: 
- Staggered Pattern (y or n): N
- Relative Confinement: 
- Spacing (ft): 13
- Subdrill (ft): 4
- Number of Lost Holes: 0
- Tons Shot: 12,675

**EXPLOSIVES DATA:**
- Bulk Explosive Weight: 1000 lbs
- Booster Units: 6340
- Delays Units: 450 lbs
- Misc. Units: 40
- Max (lb/hole): 340
- Total Charge Wt.: 6900
- Blast Duration (sec): 504.845

**VIBRATION DATA:**
- Nearest Structure: Metacay
- Seismograph Loc.: 5000 ft
- Temperature: 64°F
- Max. Chrg. (lb/ms): 340
- Northing: 37°59'14" N
- Easting: 122°27'23" W
- Sky Condition: Clear
- RPPV: 
- Distance Away: 1742
- Wind Direction: NW
- Frequency: 
- Airblast: 

**PERFORMANCE DATA:**
- Powder Factor (lb/ton): .5
- Lb/yrd^3: 1.5
- Vibration: Good
- Fragmentation: Good
- Dig ability: 
- Crushability: 
- Fines: 
- Comments: 
- Blaster in Charge: [Signature]
GeoSonics Inc. Seismic Analysis
Stop Event Report

Serial No: 9856 v3.23
Client: COUNTY MARIN
Operation: SAN RAFAEL ROCK QUARRY
Location: ON QUARRY PROPERTY
Distance:
Operator: VIBRA-TECH GSM
Comment:

Begin Date: 04/12/2011 06:04:52 (UTC-7)
End Date: 04/12/2011 12:29:42 (UTC-7)
Events over Trigger: 0 (2-1)
Record Time: 5.0 s
Seismic Trigger: 0.030 in/s
Sound Trigger: N/A
Battery Level: 8.7

Shakeable Calibrated: 01/27/2011
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 on Quarry Property (S/N 9856) did not trigger during the shot on April 12, 2011 at approximately 12:02 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.
The seismograph located across the street from 16 Marin Bay Park Court (S/N 7155) did not trigger during the blast on April 12, 2011 at approximately 12:02 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.
The seismograph at 114 San Marino Drive (S/N 9669) did not trigger during the shot on April 12, 2011 at approximately 12:02 indicating the ground vibrations produced were below the ground trigger level of 0.030 in/sec.