Green Mining

A look at the Industry of Today

Adam Harper
Director of Policy Analysis
California Construction & Industrial materials Association
2010
Overview

• Who is CalCIMA
• Mining In California Today
• What does Green Mining Mean
• Modern Reclamation
• Legacy Impacts on Modern Operations
Who is CalCIMA

• A trade association that represents the Construction Aggregate & Industrial Minerals Industries.
  – Sand & Gravel & Crushed Stone
  – Cement & Ready Mixed Concrete
  – Limestone
  – Diatomaceous Earth
  – Rare Earths
  – Clay’s
  – Industrial Sand
  – ….
# Mining in California Today


<table>
<thead>
<tr>
<th>Mineral</th>
<th>2005 Quantity (short tons)</th>
<th>2005 Value (thousands $)</th>
<th>2006 Quantity (short tons)</th>
<th>2006 Value (thousands $)</th>
<th>2007 Quantity (short tons)</th>
<th>2007 Value (thousands $)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Boron (B₂O₃)</td>
<td>674,700</td>
<td>713,000</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>6,800,000</td>
</tr>
<tr>
<td>Cement</td>
<td>3765,100</td>
<td>80,600</td>
<td>769,500</td>
<td>89,500</td>
<td>566,000</td>
<td>65,800</td>
</tr>
<tr>
<td>Masonry</td>
<td>12,749,300</td>
<td>1,130,000</td>
<td>12,017,300</td>
<td>1,190,000</td>
<td>12,017,300</td>
<td>1,180,000</td>
</tr>
<tr>
<td>Portland</td>
<td>22,000</td>
<td>2,200</td>
<td>26,500</td>
<td>2,500</td>
<td>26,500</td>
<td>2,500</td>
</tr>
<tr>
<td>Clays:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Bentonite</td>
<td>1,114,600</td>
<td>16,600</td>
<td>820,100</td>
<td>7,600</td>
<td>793,800</td>
<td>7,500</td>
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<tr>
<td>Common</td>
<td>208,400</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Gemstones</td>
<td>NA</td>
<td>1,100</td>
<td>NA</td>
<td>1,000</td>
<td>NA</td>
<td>1,000</td>
</tr>
<tr>
<td>Gold³</td>
<td>65,300</td>
<td>29,000</td>
<td>21,600</td>
<td>13,100</td>
<td>19,400</td>
<td>13,000</td>
</tr>
<tr>
<td>Sand and gravel:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Construction</td>
<td>179,956,700</td>
<td>1,422,900</td>
<td>188,571,100</td>
<td>1,522,900</td>
<td>143,286,300</td>
<td>1,372,100</td>
</tr>
<tr>
<td>Industrial</td>
<td>2,239,200</td>
<td>60,400</td>
<td>1,843,400</td>
<td>57,800</td>
<td>1,821,300</td>
<td>53,800</td>
</tr>
<tr>
<td>Silver³</td>
<td>5050</td>
<td>40</td>
<td>W</td>
<td>W</td>
<td>W</td>
<td>W</td>
</tr>
<tr>
<td>Stone:</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Crushed</td>
<td>59,862,400</td>
<td>454,700</td>
<td>60,544,900</td>
<td>644,300</td>
<td>47,675,400</td>
<td>558,100</td>
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<tr>
<td>Dimension</td>
<td>45,200</td>
<td>10,200</td>
<td>44,400</td>
<td>10,000</td>
<td>46,600</td>
<td>11,300</td>
</tr>
</tbody>
</table>

Values for boron (2006), diatomite, and other clay mine products estimated.
## Mining in California Yesterday

### Civil War Gold Production

<table>
<thead>
<tr>
<th>Year</th>
<th>OZ Gold (1)</th>
<th>$value (1)</th>
<th>2009 Value (2)</th>
<th>$ oz</th>
</tr>
</thead>
<tbody>
<tr>
<td>1861</td>
<td>2,026,187.00</td>
<td>$41,884,995.00</td>
<td>$1,021,585,243.90</td>
<td>$20.67</td>
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<tr>
<td>1862</td>
<td>1,879,595.00</td>
<td>$38,854,668.00</td>
<td>$826,695,063.83</td>
<td>$20.67</td>
</tr>
<tr>
<td>1863</td>
<td>1,136,897.00</td>
<td>$23,501,736.00</td>
<td>$398,334,508.47</td>
<td>$20.67</td>
</tr>
<tr>
<td>1864</td>
<td>1,164,455.00</td>
<td>$24,071,423.00</td>
<td>$329,745,520.55</td>
<td>$20.67</td>
</tr>
<tr>
<td>1865</td>
<td>867,405.00</td>
<td>$17,930,858.00</td>
<td>$235,932,342.11</td>
<td>$20.67</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td></td>
<td><strong>$146,243,680.00</strong></td>
<td><strong>$2,812,292,678.86</strong></td>
<td></td>
</tr>
</tbody>
</table>

1) Personal Communication John Clinkenbeard, CGS
2) [http://oregonstate.edu/cla/pollsci/sahr/sahr - Inflation Conversion Factors Calculator](http://oregonstate.edu/cla/pollsci/sahr/sahr)
What Does Green Mining Mean?

• First, Recognize that minerals fill a societal need. (Raw Materials for our Tools, Technology, Manufacturing, Infrastructure)
• Second, Modern Operators bring up-to-date science to mitigating impacts of mining.
• Reclaim Mine Lands to alternate beneficial use (s)
• Distance Matters! The closer minerals are produced to use/manufacturing location, the less energy is used transporting them.
• Modern Permitting and Regulatory Systems. (Trust but Verify)
  – Modern California Mines must be permitted undergoing CEQA, Have a (SMARA) Reclamation Plan that describes end use(s) of land as well as various environmental issues, Have a Financial Assurance Bond that is Reviewed Annually to cover the costs of reclamation, And remain subject to other environmental laws/agencies (Water Board’s, Fish & Game, Local CUPA’s, Federal Agencies as applicable etc…)
Distance Matters

• A single mile of a single lane of road construction requires 20,000 tons of aggregate.
  – Driving here from Sacramento I drove over Roughly 1,120,000 Tons of Rock

• CalTrans estimates a current average hauling distance of 50 miles. If the trip length can be reduced by even 15 miles, then diesel fuel consumption can be reduced by 44 million gallons annually.
  – 44 Million Gallons of diesel fuel represents over 438K MT CO2 a year
  – NRDC Estimates Importing Food to California each year causes 250K MT of greenhouse gases a year.

• Importing Cement from Asia to California Added an extra .15-.3 tons of CO2 emissions per ton of cement.
Reclamation

Fish Creek, Azusa, CA
Reclamation

Trammel Crow Development
Irwindale, CA
Post Reclamation (Year 2)
Urban Environment
Riparian Habitat
Post - Reclamation
Urban Environment
High School Ballfields
Yuba Goldfields

Pre - Mining
Rural - Goldfields
Yuba Goldfields

Post Reclamation (year 3)
Rural - Goldfields
Riparian Habitat
How Can Modern Operations Assist With Legacy Issues

• Broad Expertise In Reclamation
• Industry Supported Good Samaritan Changes to Porter Cologne.
• On a Project by Project basis Some Legacy sites have been remediated.
  • Generally where they have interfaced with new proposed sites.
  • Physical Hazard Remediation much more likely than Chemical Hazards.
  • Clean Water Act Liability requires careful analysis whenever a modern operation may impact historic activities.