

CALIFORNIA NON-FUEL MINERALS 2011

By John Clinkenbeard, Supervising Engineering Geologist (PG #4731) and Joshua Smith, Engineering Geologist (GIT # 379), California Geological Survey

Based on the U.S. Geological Survey's (USGS) preliminary data for 2011, California ranked seventh after Florida, Alaska, Utah, Minnesota, Arizona and Nevada in the value of non-fuel mineral production, accounting for approximately 3.9 percent of the nation's total. The market value of non-fuel mineral production for California was \$2.9 billion. California produced more than two dozen different non-fuel mineral commodities during the year. California led the nation in the production of diatomite and natural sodium sulfate, and was the only producer of boron compounds and rare earth minerals. The state ranked second behind Texas for portland cement production. The only metals produced in California were gold and silver. California ranked fifth in gold production out of eleven states that reported gold production for the year. Other minerals produced commercially include common clay, bentonite clay (including hectorite), crushed stone, dimension stone, feldspar, fuller's earth, gemstones, gypsum, iron ore (used in cement manufacture), kaolin clay, lime, magnesium compounds, pumice, pumicite, salt, soda ash, sodium sulfate, and zeolites.

There were about 700 active mines in California producing non-fuel minerals during 2011 (California Office of Mine Reclamation). Approximately 5,300 people were employed at these mines and their processing facilities (U.S. Bureau of Labor Statistics).

INDUSTRIAL MINERALS

Boron was California's leading mineral commodity in terms of dollar value in 2011. Because there are only two producers of boron minerals in the state, specific production values are withheld to protect proprietary company information and the value of boron production is included in the "other" category in the table and chart. However, the value of boron production is greater than the value of the second ranked construction sand and gravel at \$591 million for 87 million tons produced. The third highest dollar value mineral commodity produced was portland cement valued at \$587 million for 8.3 million tons produced. Crushed stone ranked fourth in value for industrial minerals and fifth overall (behind gold) with a value of \$295 million for 34 million tons produced.

Among the industrial minerals, construction materials including aggregate (sand and gravel and crushed stone) and portland cement typically account for more than half of the value of the annual non-fuel mineral production in California and are critical to the state's construction industry. The construction industry in California was hit hard by the recession in 2007-2009 and has been slow to recover, leading to greatly decreased demands for construction materials in the intervening years. While commercial and residential construction was still slow throughout much of the state in 2011, construction began increasing in some areas of the state as indicated by slight increases in production for construction sand and gravel and portland cement for the first time since 2007.

Aggregate

Construction aggregate (sand and gravel and crushed stone) showed an increase in production, but a decrease in value for 2011 relative to 2010. Total production of construction aggregate in 2011 was 120.5 million tons valued at \$886 million. This compares to the 2010 (revised) production of 117.4 million tons valued at \$1,122 million. Although the value has dropped, the 2.6 percent increase in production represents the first increase in production since the beginning of the economic recession in 2007.

The permitting process for Granite Construction Company's Liberty Quarry project, located in southeastern Riverside County about three miles south of the City of Temecula, continued throughout 2011. The permit for the Liberty Quarry project was tentatively denied by the Riverside County Planning Commission in August 2011 and the decision finalized the following December. The permit denial was appealed to the County Board Supervisors, which voted to reject the appeal in February 2012.

Cemex released a final EIR for its proposed Jessie Morrow Mine in Fresno County in December. The document included revisions that would scale back the proposed project, reducing its footprint, tonnage, and lifespan. The revised plan would preserve the mountain's ridgeline, a point of controversy with local citizens of the previous plan. The project is expected to be heard by the Fresno County Planning Commission in early 2012.

In December, the Sacramento County Board of Supervisors gave tentative approval for the proposed 620 acre Stoneridge Quarry in eastern Sacramento County. Final approval is expected in early 2012.

Cement

Portland cement production increased to 8.3 million tons valued at \$587.4 million in 2011 ranking third in value among commodities produced in the state. This is an increase of about 7.8 percent over the 2010(revised) production of about 7.7 million tons and the first increase since the beginning of the recession in 2007. Cement imports through California ports remained at low levels in 2011.

Rare Earth Elements

The Mountain Pass Mine in San Bernardino County operated by Molycorp Minerals LLC. continued to sell materials from previously mined rare-earth concentrates in 2011. The company also proceeded with construction of new processing facilities as part of "Project Phoenix", an effort to expand and modernize its rare-earth production facilities. Upon completion of Project Phoenix, the state of the art facility will have the ability to produce 40,000 metric tons of rare-earth oxide equivalent products per year.

METALS

The only metals produced in California in 2011 were gold and silver. Gold dominated California's metal production in 2011 – comprising over 99.9 percent of the value of the state's metals production. Gold production decreased slightly to 198,770 ounces in 2011, from a 2010 (revised) production of 198,980 ounces. The value of gold production in the state increased to \$323.7 million from \$244.3 million in 2010. The increase in value of gold produced is a result of higher gold prices in 2011.

The state's largest gold producer was New Gold Inc.'s Mesquite Mine in Imperial County – producing approximately 158,000 ounces for the year. The other major producer of gold in California was the Atna Resources Ltd., Briggs Mine in Inyo County. The Briggs Mine resumed gold production in early 2009 and produced about 32,000 ounces in 2011. In June Atna applied for a 94-acre expansion to Briggs' mining permit from the Bureau of Land Management. This expansion would extend the mine's life by an estimated 3-5 years. A final decision was made to grant the expansion in February of 2012.

In addition to the above mentioned lode mines, placer gold is produced from one active dredge and as a by-product from many sand and gravel mines in the northern and central parts of the state. California also has several small lode mines that sporadically produce specimen gold including gold in quartz for use in jewelry.

Silver is produced as a by-product of gold production and makes up less than one tenth of one percent of California's total metal production by value. Specific production values are withheld to protect proprietary company information and the value of silver production is included in the "other" category in the table and chart. Silver production decreased slightly in 2011.

Iron ore, mined in one location in San Bernardino County, is considered an industrial mineral because it is used for the production of portland cement.

THE CALIFORNIA GEOLOGICAL SURVEY

The California Geological Survey's (CGS) Mineral Land Classification Project, a mandate of the Surface Mining and Reclamation Act (Public Resources Code Section 2710, et seq.), continued to provide lead agencies with mineral resource maps that have proved to be of great value in land-use planning and mineral resource conservation. To date, CGS has completed mineral resource studies in about one third of the state. During the year, CGS completed and updated classification projects in San Luis Obispo, Santa Barbara, and Stanislaus counties. CGS also assisted the State Mining and Geology Board in the designation process for the Bakersfield Production-Consumption Region in Kern County, and the San Gabriel Valley Production-Consumption Region in Los Angeles County. Classification updates are ongoing in the Stockton-Lodi area, and the North and South San Francisco Bay areas.

Amount and value of non-fuel mineral production for 2009, 2010, 2011.^{1,2}

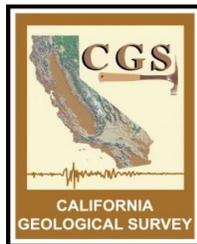
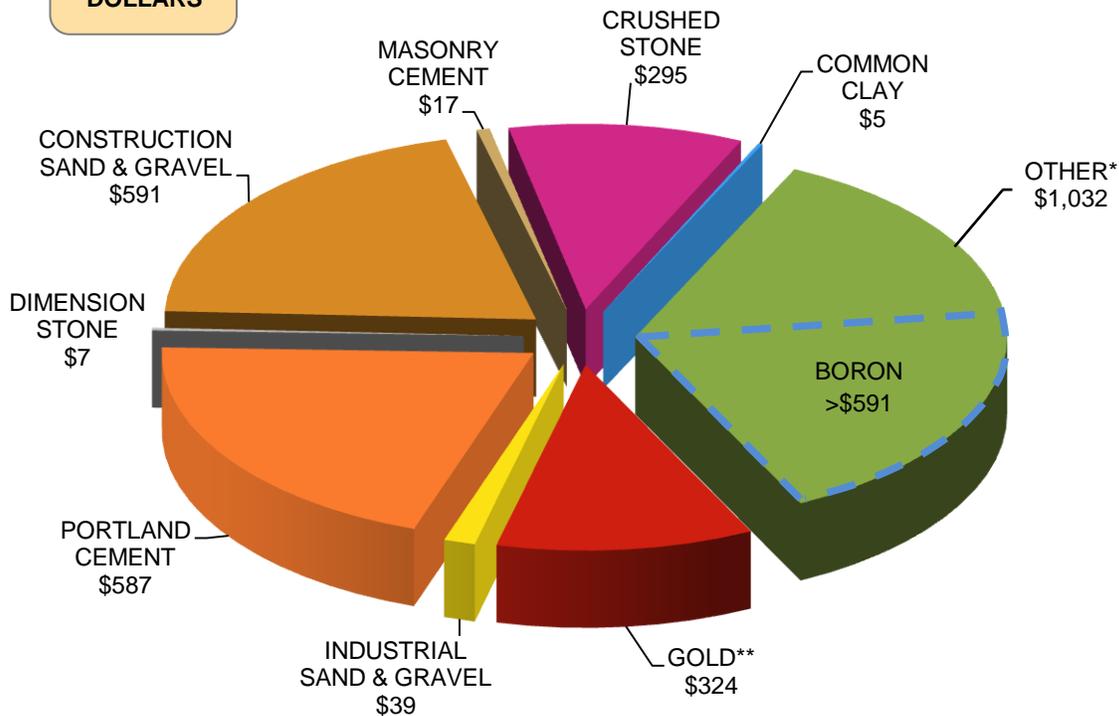
Mineral	2009 ^R		2010 ^R		2011 ^P	
	Quantity	Value (thousands \$)	Quantity	Value (thousands \$)	Quantity	Value (thousands \$)
Boron Minerals short tons	W	W	W	W	W	W
Cement						
Masonry short tons	260,000	28,100	196,200	19,500	^e 172,000	^e 16,600
Portland short tons	7,885,000	646,000	7,655,500	548,600	^e 8,279,000	^e 587,400
Clays:						
Bentonite short tons	24,000	2,300	24,900	2,700	W	W
Common short tons	351,000	2,400	391,500	5,000	393,000	5,400
Gemstones	NA	700	NA	750	NA	770
Gold ³ troy ounces	⁴ 159,900	⁴ 155,900	⁴ 198,980	⁴ 244,300	⁴ 198,770	⁴ 323,700
Sand and gravel:						
Construction short tons	87,277,000	912,100	82,360,000	809,000	86,789,000	590,500
Industrial short tons	1,432,000	35,800	1,457,000	39,400	1,500,000	39,400
Silver ³ troy ounces	W	W	W	W	W	W
Stone:						
Crushed short tons	43,916,000	377,600	34,995,000	313,000	33,700,000	295,400
Dimension short tons	27,000	6,100	28,800	6,900	31,800	6,700
Values for boron, clays (bentonite, fire, and kaolin), diatomite, feldspar, gypsum (calcined), iron ore (usable shipped), lime, magnesium compounds, perlite (crude), pumice and pumicite, rare earths, salt, silver, soda ash, sodium sulfate and zeolites are combined to avoid disclosing company proprietary data.						
Total combined and W values		920,000		848,000		1,032,000
Total annual value-all minerals		3,419,300		2,895,000		2,897,000
¹ Production as measured by mine shipments, sales, or marketable production (including consumption by producers). ² Quantity and value data are rounded to the nearest 100 units except for silver and gemstones (rounded to nearest 10 units). ³ Recoverable content of ores, etc. ⁴ Data from California Department of Conservation, California Geological Survey. ^P Preliminary. ^e Estimate. NA=Not available. W=Withheld to avoid disclosing company proprietary data; value included with combined value data. ^R Revised from previous non-fuel mineral production report.						

Modified from unpublished U.S. Geological Survey (USGS) data, subject to change; official USGS final 2011 data will be published in the California chapter of the USGS Mineral Yearbook, Area Reports: Domestic 2011, Volume II.

CALIFORNIA NON-FUEL MINERAL PRODUCTION 2011

Total Value \$2.9 Billion

VALUES IN
MILLIONS OF
DOLLARS



* OTHER Includes: boron, clays (bentonite, fire, and kaolin) diatomite, feldspar, gemstones, gypsum, iron ore, lime, magnesium compounds, salt, silver, soda ash and zeolites

** Data from California Geological Survey
Information modified from preliminary unpublished U.S. Geological Survey (USGS) data and subject to change; Official USGS final 2011 data will be published in the California Chapter of the USGS Mineral Year Book, Area Reports: Domestic 2011 Volume II.