CALIFORNIA NON-FUEL MINERAL PRODUCTION 2021

California
Department of Conservation
California Geological Survey

CALIFORNIA NON-FUEL MINERAL PRODUCTION 2021

By

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INTRODUCTION

This report summarizes non-fuel mineral production in California in 2021. For this report, production is defined as the weight of the commodity sold, reported as short tons or troy ounces. California is one of the largest producers of non-fuel minerals in the United States. Non-fuel minerals comprise a variety of commodities produced by mining, but exclude fuel commodities like coal and oil shale. In addition to 2021 production data, this report includes figures showing production from 1991 to 2021 for a select number of commodities. In cases where a small number of mines produce a specific commodity, production data are withheld to protect proprietary company information. Production data made available to the public by the mining company are not considered proprietary.

Data used in this report are mainly from the California Department of Conservation's Division of Mine Reclamation (DMR) and the United States Geological Survey (USGS). DMR data consist of production data from 1991 to 2021. USGS data consist of 2021 production values for several individual commodities, purposely grouped production values where individual commodity results are concealed to protect unpublished data, and unit prices for gold and silver. Additional production data come from mining companies.

Mines regulated under the Surface Mining and Reclamation Act of 1975 (SMARA, Public Resources Code, Sections 2710-2796) are required to report production annually. In general, mines that will remove at least 1,000 cubic yards of overburden or mineral product, or disturb at least one acre of land, are regulated by SMARA. Since not every small mining operation is regulated by SMARA, there may be a minor amount of production not accounted for in this report.

Based on data from the DMR, 627 mines reported production greater than zero. Figure 1 shows the number of producing mines from 1991 to 2021. Thirty-three non-fuel mineral commodities were reported to the DMR. These commodities are divided into the following three categories for this report based on the California State Mining and Geology Board (SMGB) Guidelines for Classification and Designation of Mineral Lands (SMGB, 2000):

- Construction materials
- Industrial and chemical mineral materials
- Metallic and rare minerals

Prior to the Non-Fuel Mineral Production 2018 report, the California Geological Survey (CGS) Annual Non-Fuel Mineral Production reports were based mostly on data provided by the USGS. The USGS data included production data and unit prices for either the mined mineral (e.g., limestone) or an end-use commodity (e.g., cement) and are based on mine operator surveys. For years 2018 and 2019, national average commodity unit prices published by the USGS were available, but production data for California were not (except for cement clinker). For years 2020 and 2021, USGS production and unit prices were made available for several commodities. Because commodities

reported to the DMR and USGS do not match in many cases, CGS cannot compare data reported to the DMR with past annual non-fuel reports based on the USGS data.

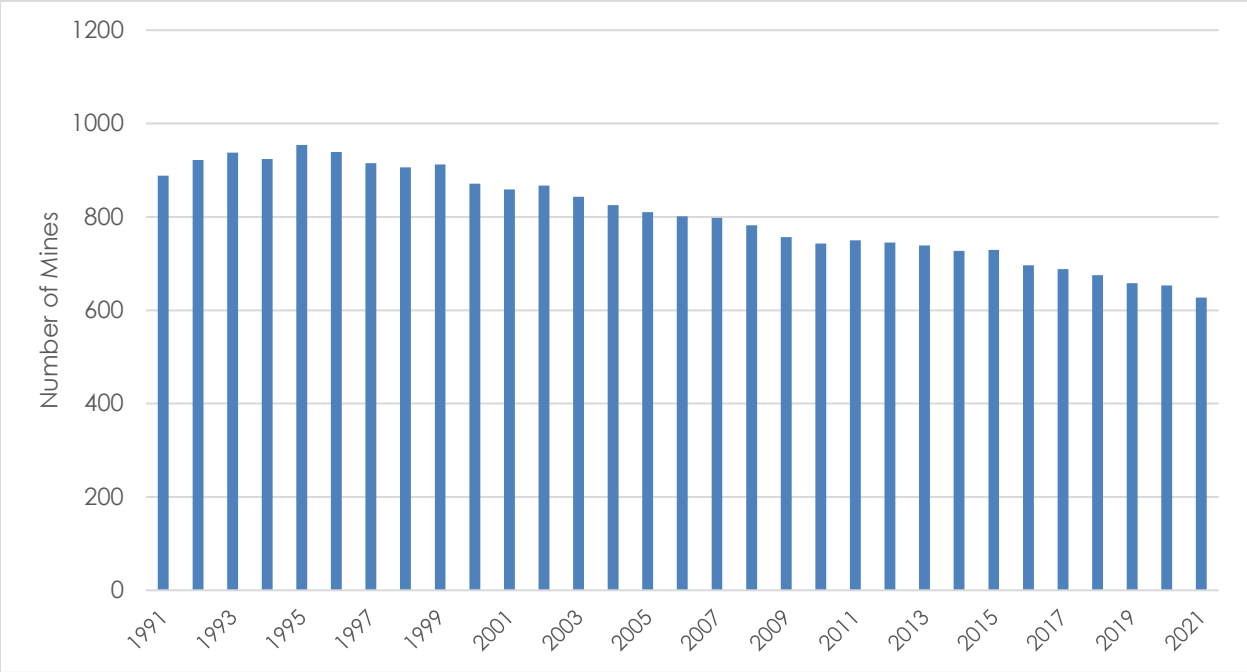

Figure 1. Number of producing mines from 1991-2021

PRODUCTION VALUE SUMMARY

Using a combination of data from DMR, USGS, and MP Materials, the total estimated California non-fuel mineral production value was $5.0 billion in 2021. Figure 2 is a production value summary chart. It shows the production values for some individual commodities and, where required to protect unpublished USGS data, a group of commodities.

Based on USGS preliminary data, California ranked fourth—behind Arizona, Nevada, and Texas—in non-fuel mineral production value, accounting for approximately 5.83 percent of the nation's total (USGS, 2022a). Below is California's national production value ranking for commodities where production was ranked by state and California was mentioned in the commodity summary (USGS, 2022a):

- Sand and Gravel: First
- Gypsum: First
- Rare Earth Elements: First
- Feldspar: First
- Cement: Third
- Crushed Stone: Ninth

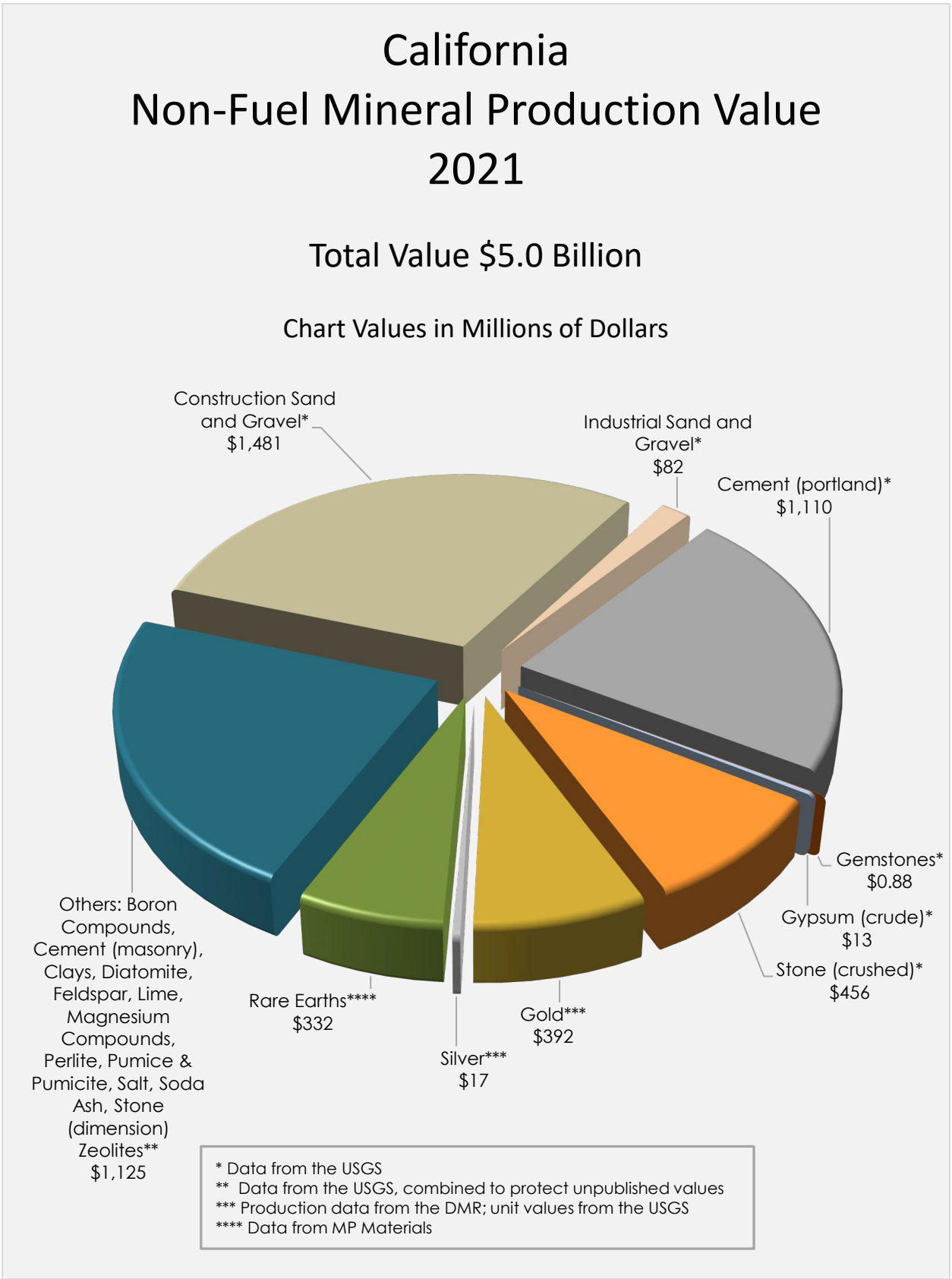

Figure 2. Production value summary chart

PRODUCTION BY MINERAL CATEGORY

Construction Materials

In 2021, construction materials included nine commodities produced by 531 mines. Table 1 summarizes the commodities and production.

Table 1. Construction materials 2021 production summary

Commodity	Number of Mines	Production (short tons)
Cinders	14	313,304
Decomposed Granite	39	1,379,536
Decorative Rock	18	280,886
Dimension Stone	3	1,981,584
Fill Dirt	25	1,550,535
Pumice	6	168,653
Rock	30	2,316,686
Sand and Gravel	345	116,228,059
Stone	51	7,840,473

Sand and gravel is produced throughout the state and comprises the majority of construction materials production. California led the nation in the production value of construction sand and gravel at approximately $1.48 billion (USGS, 2022a; USGS, 2022b). Sand and gravel production was 116 million short tons from 345 mines. Figure 3 shows sand and gravel production from 1991 to 2021. Attachment 1 shows the relative density of sand and gravel mines throughout the state.

Figure 4 shows the production of construction materials other than sand and gravel from 1991 to 2021. Data for individual commodities before 1996 were not included to protect proprietary information. Attachment 2 shows the location of mines that produced construction materials other than sand and gravel in 2021.

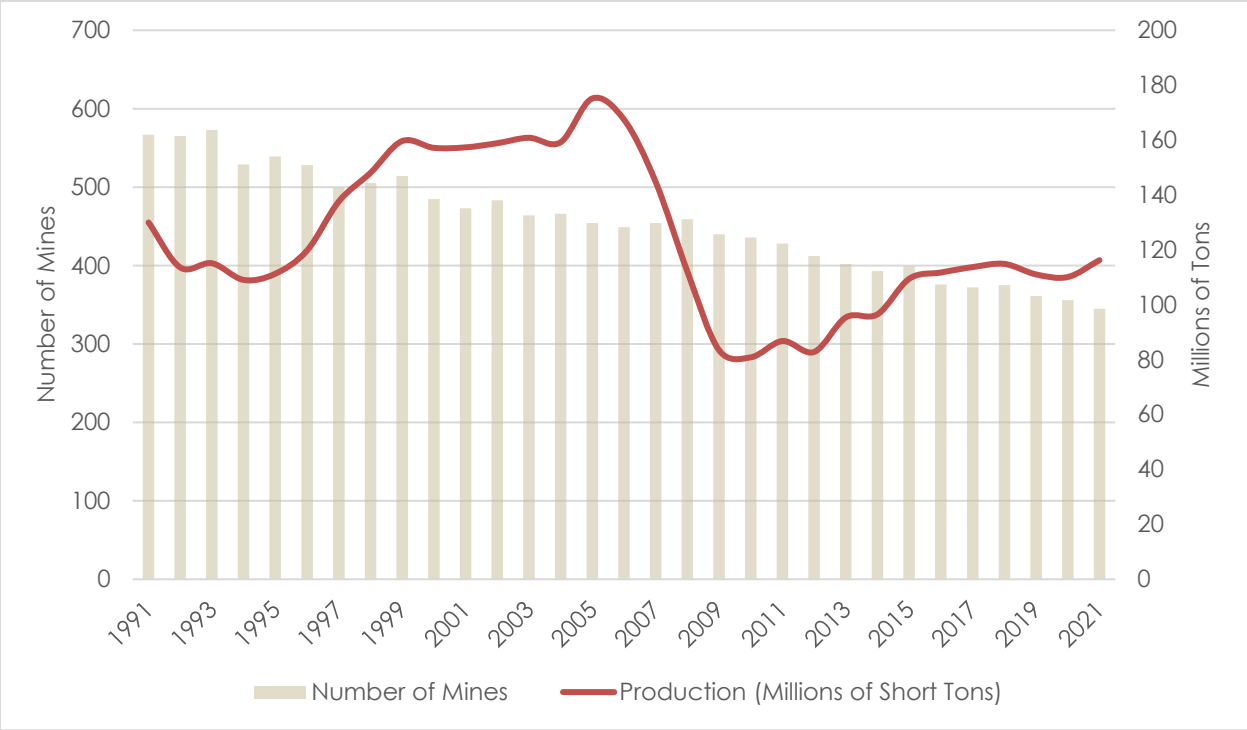

Figure 3. Sand and gravel production from 1991 to 2021

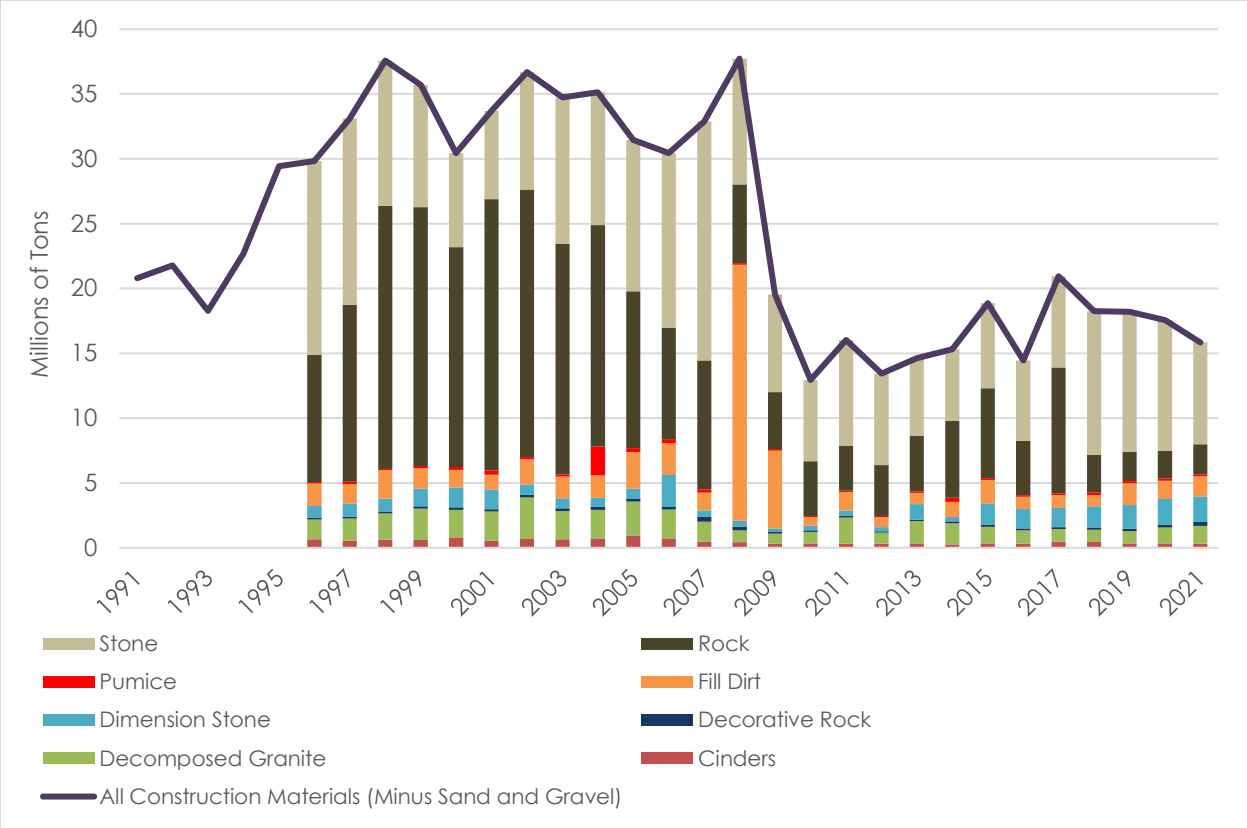

Figure 4. Construction materials (minus sand and gravel) production from 1991-2021

Industrial and Chemical Mineral Materials

In 2021, industrial and chemical mineral materials included 18 commodities produced by 113 mines. Table 2 summarizes these commodities and the associated production. Attachment 3 shows the location of producers.

Table 2. Industrial and chemical materials 2021 production summary

Commodity	Number of Mines	Production (short tons)
Abrasives	2	W
Borates	2	W
Clay	29	780,674
Diatomite	3	388,673
Dolomite	3	W
Feldspar	1	W
Gypsum	5	1,274,910
Kyanite	1	W
Lime	1	W
Limestone	27	18,809,221
Perlite	1	W
Saline Compounds	3	1,033,891
Salt	3	349,164
Shale	17	444,523
Silica	4	577,928
Specialty Sand	7	1,027,634
Talc	1	W
Zeolites	3	19,468

W = Production withheld to protect proprietary information

Limestone production was 18.8 million short tons from 27 mines. Most of the limestone produced in California is used for the manufacture of cement, with the remainder produced as crushed rock (a construction material) and as specialty products.

The amount of limestone used to manufacture cement is not reported to the DMR; however, according to USGS industry surveys, California portland cement production was 10.3 million short tons (USGS, 2022b). The value of portland cement was approximately $1.11 billion (USGS, 2022b). Figure 5 shows limestone production from 1991 to 2021.

Gypsum production was 1.27 short tons from five mines. The value of gypsum was approximately $17.6 million (USGS, 2022b). Figure 6 shows gypsum production from 1991 to 2021. Gypsum is most commonly used for wallboard, agriculture (as a soil amendment), and in the manufacture of portland cement.

Clay production was 781 thousand short tons from 29 mines. Clay uses include ceramics, cement production, absorbents, drilling fluid components, landfill liners, and others. Figure 7 shows clay production from 1991 to 2021.

Specialty sand production was 1.03 million short tons from seven mines. Specialty sands are used for applications other than aggregate, including golf course sand traps, beach volleyball courts, and many others. Figure 8 shows specialty sand production from 1991 to 2021.

Borates were produced by two mines including U.S. Borax's Boron Pit, the largest open-pit mine in California (U.S. Borax, 2023). The element boron is used in a wide range of products including fiberglass insulation, ceramics, high strength glass, agriculture, fire retardants, detergents, advanced composite materials, and insecticides.

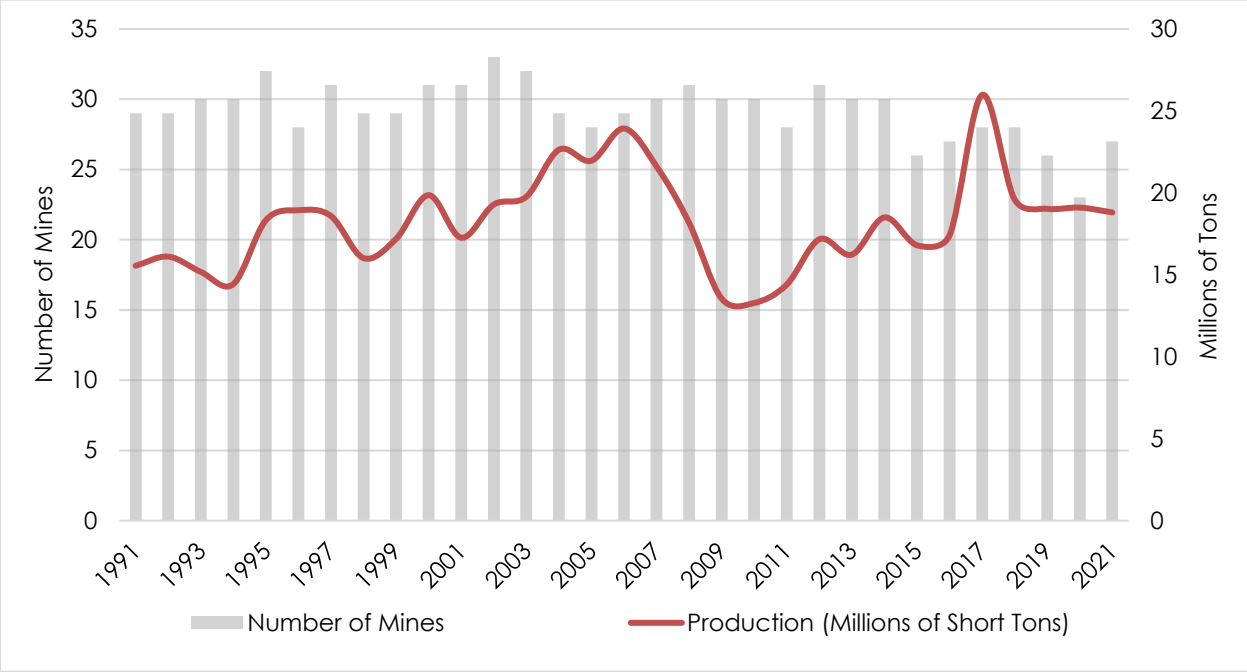

Figure 5. Limestone production from 1991 to 2021

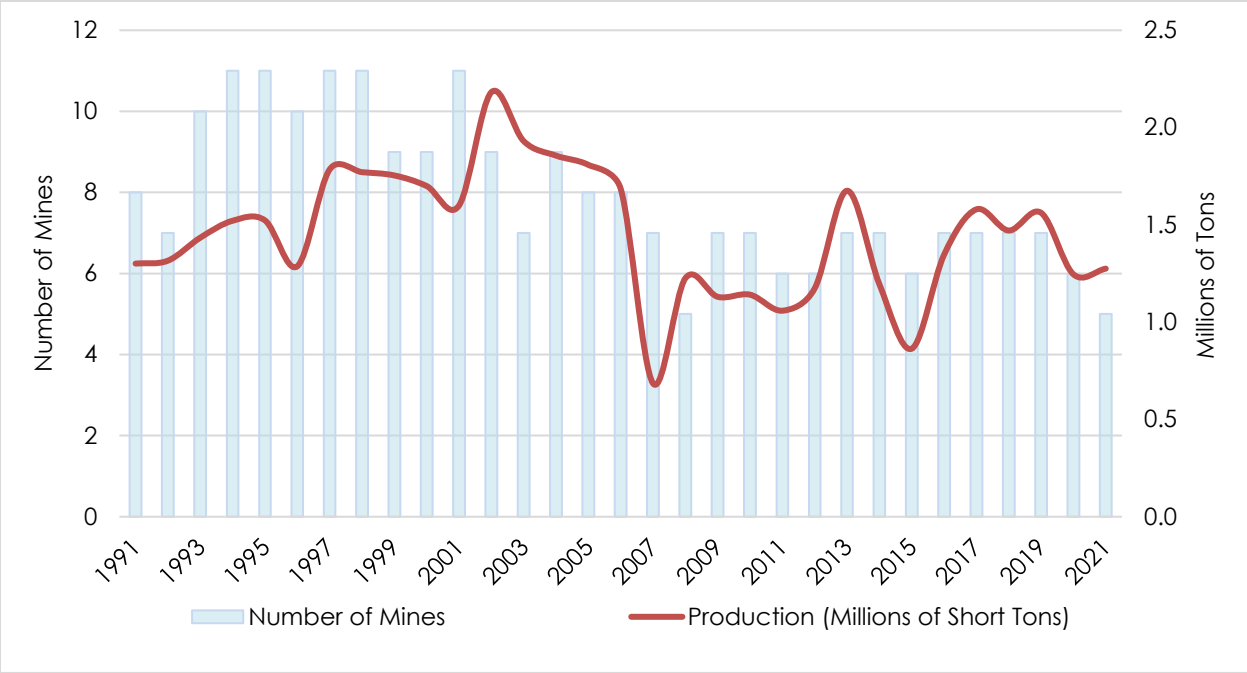

Figure 6. Gypsum production from 1991 to 2021

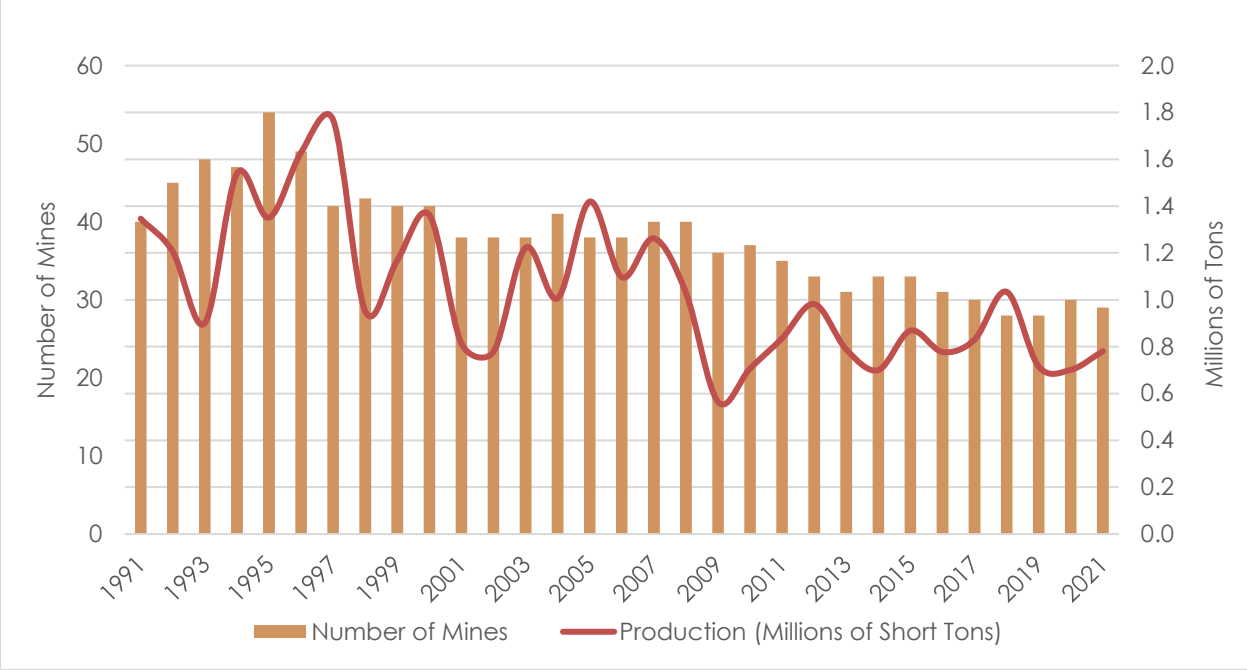

Figure 7. Clay production from 1991 to 2021

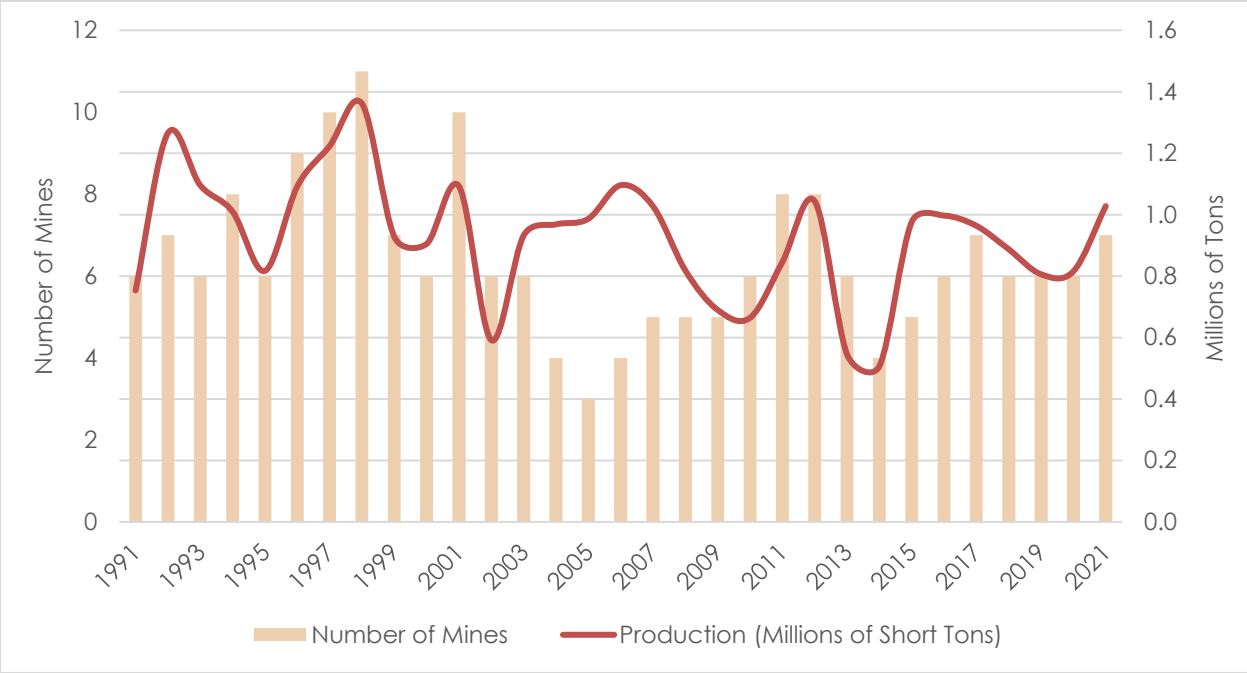

Figure 8. Specialty sand production from 1991 to 2021

Metallic and Rare Minerals

In 2021, metallic and rare minerals included six commodities produced by 39 mines. Table 3 summarizes the commodities and production. Attachment 4 shows the location of producers.

Table 3. Metallic and rare minerals 2021 production summary

Commodity	Number of Mines	Production
Gemstones	1	W
Gold (Lode)	6	212,713 ounces
Gold (Placer)	18	4,747 ounces
Iron Ore	5	313,606 short tons
Rare Earth Elements	1	46,752 short tons*
Silver	8	686,816 ounces

W = Production withheld to protect proprietary information

* Production of rare earth oxides as reported in MP Materials Reports Fourth Quarter and Full Year 2021 Results (MP Materials, 2023)

Gold production (lode and placer) was 217 thousand troy ounces (ounces) from 24 mines, representing an 11.7 percent production increase from 2020. The estimated value was $392 million based on an average price of $1,801 per ounce (USGS, 2023). The Western Mesquite Mine, an open-pit heap-leach mine in Imperial County, led California in gold production with 137,467 ounces (Equinox Gold Corp., 2023). In addition to the nine mines (six lode and three placer) that reported gold as a primary commodity, 15 construction materials mines produced gold as a secondary commodity. Those mines accounted for 1.8 percent of gold production. Figure 9 shows gold production from 1991 to 2021.

Silver production was 687 thousand ounces from eight mines, representing a 2.08 percent decrease from 2020. The estimated value was $17.3 million, based on an average price of $25.23 per ounce (USGS, 2023). All mines that reported silver production also reported gold production. Figure 10 shows silver production from 1991 to 2021.

Iron ore production was 314 thousand short tons from five mines. Iron ore produced in California is predominantly used in the manufacture of cement.

Rare earth elements were produced at the Mountain Pass Mine in San Bernardino County. The mining company, MP Materials, reported production of 46,752 short tons of rare earth oxides with product sales of $332 million in 2021 (MP Materials, 2023). Rare earth elements are a group of 15 individual metallic elements that are critical to modern technologies, including high-powered magnets, lasers, and solar panels.

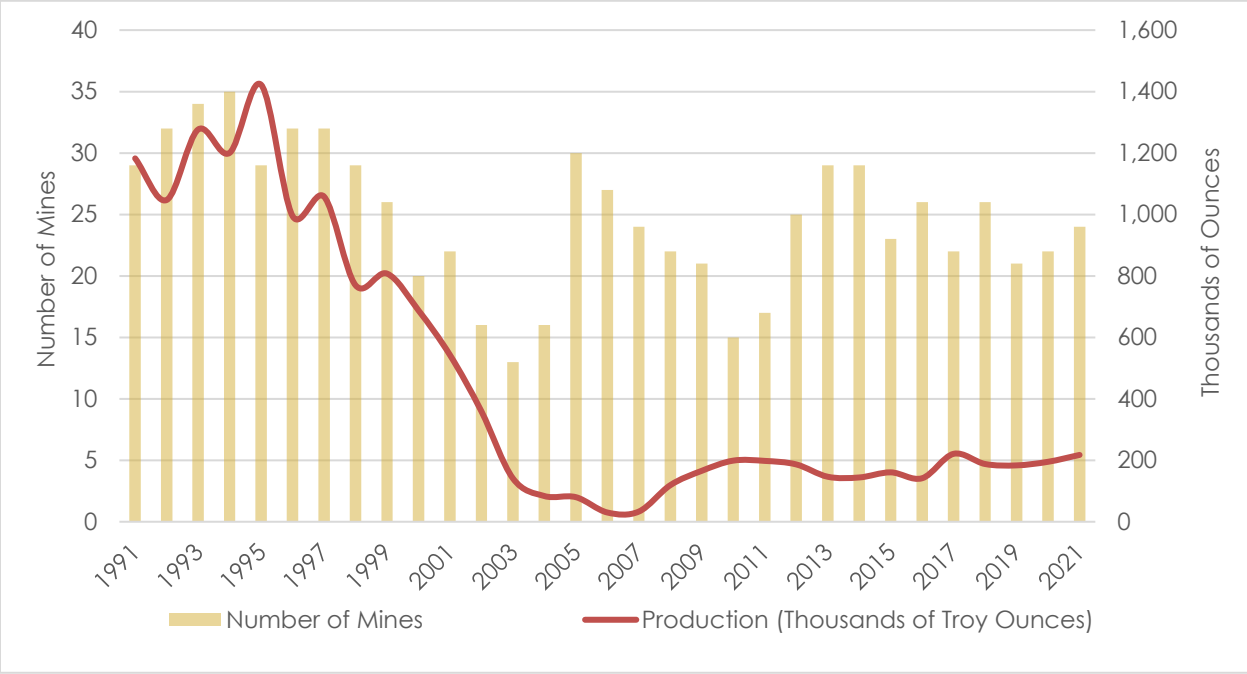

Figure 9. Gold production from 1991 to 2021

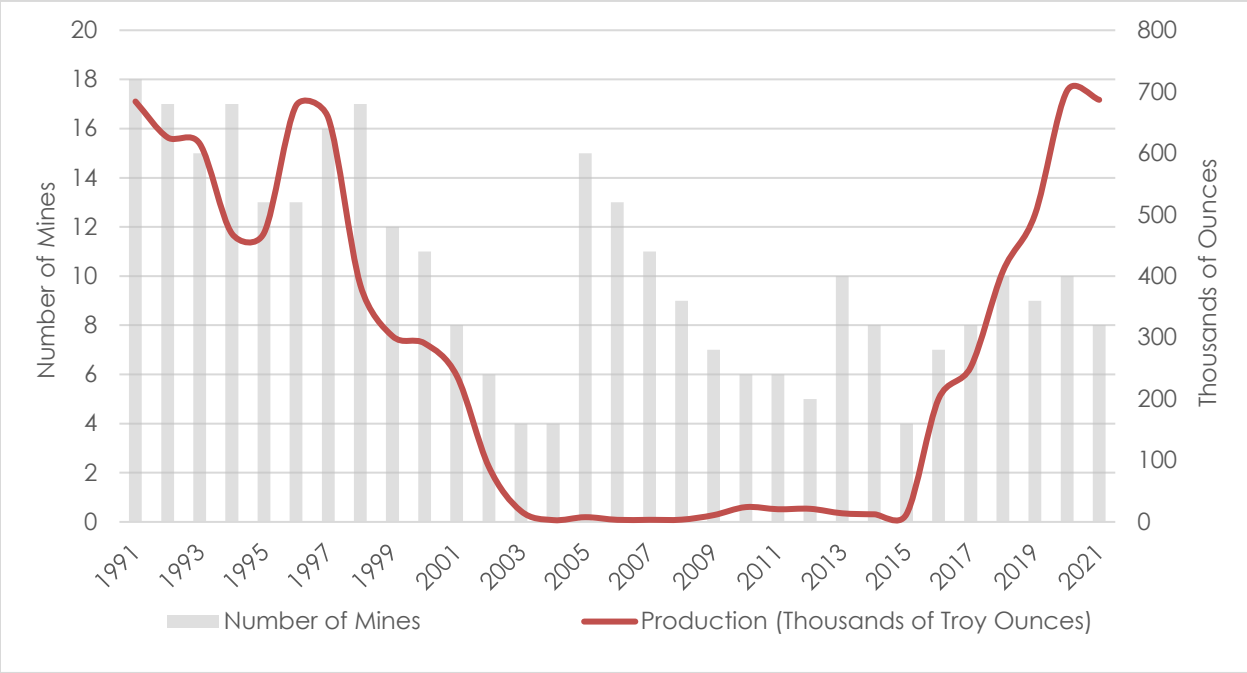

Figure 10. Silver production from 1991 to 2021

CURRENT EXPLORATION

As of September 2023, a search of mining publications indicates there are mineral exploration efforts underway for base metals (including copper and zinc), gold and silver, and lithium. Attachment 5 shows the location of the exploration efforts listed below.

Base Metals

The Blue Moon Project is a proposed zinc-silver mine in Mariposa County, 22 miles northeast of Merced. The project contains a massive sulfide deposit that would likely be mined underground. Inferred resource estimates were prepared based on a 2018 drilling program. Results from a 2021 drilling program were released in March, 2022 (Blue Moon Metals, 2023).

The US Copper Corp. Moonlight-Superior and Engels Project is a proposed copper mine in Plumas County. The project includes previously mined areas of Lights Creek. Results from a recent 15-hole drilling program were released in September. The indicated resource is 1.3 billion pounds of copper (U.S. Copper Corp., 2023).

Gold and Silver

The Apollo Calico Silver Project is a proposed area of silver mining in San Bernardino County. The project consists of the Waterloo and Langtry properties located in the Calico mining district. Measured and indicated silver reserves of 110 million ounces have been reported for the Waterloo property. Additional inferred reserves have been reported for the Waterloo property and Langtry properties (Apollo Silver, 2023).

The Gold Discovery Group, LLC is planning to conduct exploration for gold within their existing claims in Kern and San Bernardino Counties. The project area is located in the Fremont-Kramer Area of Critical Environmental Concern, north of Johannesburg. The Bureau of Land Management (BLM) approved a drilling project that allows for up to 293 shallow holes (BLM, 2023).

The Kore Mining Imperial Project consists of a 31,000 acre exploration area including a proposed open-pit heap-leach gold mine in Imperial County. The conceptual pit has indicated reserves of 900,000 ounces. The company has conducted field studies including assaying and is working towards permitting a drilling program (Kore Mining, 2023a).

The Kore Mining Long Valley Project is a proposed open-pit heap-leach gold and silver mine in Mono County. The project consists of a large, shallow epithermal gold and silver deposit. The project is based on existing drilling data completed before 1997. Permitting has been approved for a drilling program with up to 36 holes from 12 drill pads. (Kore Mining, 2023b).

The K2 Mojave Project is an area of proposed drilling targets for gold exploration in Inyo County. The project area is located south to southeast of the historical Cerro Gordo mine and ghost town. The project area also contains zones of anomalous base metals

and copper. K2 has submitted a modified plan of operations for their proposed "Phase II Drill Program" to the BLM (K2 Gold, 2023).

The Rise Gold Idaho-Maryland Mine Project is the proposed reopening of the historical Idaho-Maryland gold mine in Nevada County. The proposed project would be underground-only and include gravity/flotation processing of ore. Rise Gold submitted a vested rights petition to Nevada County (Rise Gold, 2023).

The Southern Empire Oro Cruz Project is an area of gold exploration in Imperial County. The project area covers historical open-pit mines in the Cargo Muchacho Mountains including the American Girl Mine, American Boy Mine, and the Padre y Madre Mine. The BLM has approved drilling for up to 65 holes within target areas (Southern Empire, 2023).

The Stratabound Minerals Fremont Project is a proposed open-pit gold mine in Mariposa County. The project area includes the historical Pine Tree-Josephine Mine. The indicated resource is 1,163,000 ounces based on data from 162 drill holes completed between 2013 to 2016 (Stratabound Minerals, 2023).

Lithium

Berkshire Hathaway Energy Renewables (BHE Renewables), which operates 10 of the 11 geothermal plants near the Salton Sea, is working toward a demonstration project to produce lithium carbonate from its geothermal brines (BHE Renewables, 2023).

Controlled Thermal Resources (CTR) is developing a lithium-bearing geothermal brine project in Imperial County (CTR, 2023). Stellantis, a multinational automotive manufacturer, announced an investment of more than $100 million into CTR's Hell's Kitchen project near the Salton Sea (Stellantis, 2023).

EnergySource, which owns and operates one of the 11 geothermal powerplants near the Salton Sea in Imperial County, is working towards extracting lithium from its geothermal brines (CNBC, 2022; EnergySource Minerals, 2023).

Multiple companies are developing technologies for extraction of lithium from geothermal brines, most commonly involving a membrane filtration process.

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APPENDIX

The following tables represent the data used to generate the report production figures.

Data for Figure 1. Number of producing mines from 1991 to 2021

Year	Number of Mines
1991	888
1992	922
1993	938
1994	924
1995	954
1996	939
1997	915
1998	906
1999	912
2000	871
2001	859
2002	867
2003	843
2004	825
2005	810
2006	801
2007	798
2008	782
2009	757
2010	743
2011	750
2012	745
2013	739
2014	727
2015	729
2016	696
2017	688
2018	675
2019	658
2020	653
2021	627

Data for Figure 3. Sand and gravel from 1991 to 2021

Year	Number of Mines	Production (short tons)
1991	567	129,968,983
1992	565	113,570,056
1993	573	115,120,753
1994	529	109,045,312
1995	539	111,303,604
1996	528	119,755,283
1997	499	137,593,428
1998	505	148,040,277
1999	514	159,634,531
2000	485	157,167,215
2001	473	157,335,506
2002	483	158,854,129
2003	464	160,822,204
2004	466	159,187,913
2005	454	175,151,644
2006	449	167,464,187
2007	454	144,746,154
2008	459	112,078,343
2009	440	83,437,525
2010	436	80,837,158
2011	428	86,789,328
2012	412	82,813,351
2013	402	95,404,209
2014	393	96,534,589
2015	399	109,474,469
2016	376	111,758,055
2017	372	113,722,181
2018	375	114,884,368
2019	361	111,054,131
2020	356	110,101,484
2021	345	116,228,059

Data for Figure 4. Construction materials (minus sand and gravel) production from 1991 to 2021

The data for Figure 4 is divided into two tables below (A and B). The value for each mineral (and the total of all construction materials) is the production in millions of short tons.

Table A

Year	Cinders	Decomposed Granite	Decorative Rock	Dimension Stone	Fill Dirt
1991	W	W	W	W	W
1992	W	W	W	W	W
1993	W	W	W	W	W
1994	W	W	W	W	W
1995	W	W	W	W	W
1996	642,048	1,538,246	151,835	899,340	1,736,086
1997	542,698	1,702,521	153,182	1,030,120	1,469,812
1998	625,045	2,017,775	163,232	985,734	2,198,925
1999	614,380	2,403,999	166,557	1,372,744	1,562,211
2000	803,015	2,117,677	189,704	1,538,246	1,355,734
2001	559,590	2,245,864	164,060	1,520,993	1,148,461
2002	682,577	3,207,990	190,617	784,520	1,950,578
2003	644,084	2,185,386	205,970	784,277	1,667,418
2004	665,206	2,264,334	236,989	690,677	1,740,773
2005	951,470	2,623,963	196,688	768,860	2,837,913
2006	671,109	2,285,075	181,747	2,470,431	2,483,011
2007	453,661	1,557,910	365,471	499,480	1,386,823
2008	432,709	919,516	259,714	484,039	19,740,872
2009	311,362	773,939	127,363	287,253	5,997,165
2010	341,561	889,545	109,938	366,544	676,066
2011	312,888	2,030,012	114,621	404,469	1,441,497
2012	315,409	851,268	96,631	338,653	756,990
2013	332,476	1,721,557	109,696	1,211,882	856,521
2014	262,822	1,623,313	151,116	351,681	1,159,274
2015	328,703	1,294,045	176,295	1,621,296	1,804,117
2016	313,419	1,027,995	160,861	1,490,367	941,535
2017	483,313	947,927	148,264	1,484,504	993,250
2018	446,361	957,889	173,034	1,622,603	858,130
2019	323,385	962,550	171,547	1,830,949	1,695,665
2020	326,250	1,249,020	177,973	1,998,763	1,423,862
2021	313,304	1,379,536	280,886	1,981,584	1,550,535

W = Production withheld to protect proprietary information or to match the data presented in Figure 4

Table B

Year	Pumice	Rock	Stone	All Construction Materials (Minus Sand and Gravel)
1991	W	W	W	20,797,337
1992	W	W	W	21,770,506
1993	W	W	W	18,263,983
1994	W	W	W	22,685,538
1995	W	W	W	29,441,687
1996	97,653	9,834,717	14,934,207	29,834,132
1997	187,448	13,665,792	14,367,285	33,118,858
1998	94,693	20,281,945	11,200,232	37,567,581
1999	180,359	19,984,176	9,406,094	35,690,520
2000	214,341	16,962,854	7,267,461	30,449,031
2001	320,961	20,933,755	6,805,876	33,699,560
2002	169,725	20,638,573	9,064,616	36,689,195
2003	182,089	17,758,842	11,298,937	34,727,003
2004	2,213,748	17,071,940	10,241,605	35,125,272
2005	315,425	12,090,864	11,671,337	31,456,519
2006	294,884	8,570,580	13,498,027	30,454,864
2007	244,430	9,934,481	18,455,912	32,898,168
2008	125,002	6,067,288	9,701,919	37,731,058
2009	113,871	4,389,586	7,539,796	19,540,336
2010	64,167	4,216,424	6,277,863	12,942,108
2011	92,994	3,494,418	8,131,221	16,022,119
2012	105,248	3,904,232	7,062,051	13,430,481
2013	114,237	4,311,812	5,958,612	14,616,793
2014	325,213	5,917,484	5,522,879	15,313,782
2015	143,608	6,940,622	6,564,417	18,873,103
2016	135,428	4,177,898	6,195,160	14,442,664
2017	150,332	9,709,677	7,025,864	20,943,130
2018	209,899	2,904,000	11,072,853	18,244,768
2019	169,191	2,274,377	10,785,211	18,212,875
2020	156,845	2,133,037	10,105,955	17,571,705
2021	168,653	2,316,686	7,840,473	15,831,658

W = Production withheld to protect proprietary information or to match the data presented in Figure 4

Data for Figure 5. Limestone production from 1991 to 2021

Year	Number of Mines	Production (short tons)
1991	29	15,551,962
1992	29	16,109,249
1993	30	15,178,349
1994	30	14,435,661
1995	32	18,332,982
1996	28	18,939,846
1997	31	18,583,916
1998	29	16,019,172
1999	29	17,193,976
2000	31	19,858,315
2001	31	17,264,262
2002	33	19,287,688
2003	32	19,762,348
2004	29	22,631,166
2005	28	21,961,851
2006	29	23,927,899
2007	30	21,615,823
2008	31	18,172,407
2009	30	13,547,114
2010	30	13,281,545
2011	28	14,402,998
2012	31	17,165,891
2013	30	16,231,253
2014	30	18,501,115
2015	26	16,802,443
2016	27	17,410,435
2017	28	25,974,862
2018	28	19,595,243
2019	26	19,025,675
2020	23	19,100,360
2021	27	18,809,221

Data for Figure 6. Gypsum production from 1991 to 2021

Year	Number of Mines	Production (short tons)
1991	8	1,301,045
1992	7	1,315,942
1993	10	1,434,032
1994	11	1,521,049
1995	11	1,523,018
1996	10	1,287,022
1997	11	1,784,486
1998	11	1,770,807
1999	9	1,753,929
2000	9	1,699,542
2001	11	1,599,047
2002	9	2,181,548
2003	7	1,930,470
2004	9	1,855,849
2005	8	1,808,180
2006	8	1,685,445
2007	7	685,249
2008	5	1,225,550
2009	7	1,130,081
2010	7	1,141,109
2011	6	1,058,766
2012	6	1,173,625
2013	7	1,675,296
2014	7	1,194,710
2015	6	863,564
2016	7	1,346,436
2017	7	1,579,730
2018	7	1,470,963
2019	7	1,561,855
2020	6	1,245,661
2021	5	1,274,910

Data for Figure 7. Clay production from 1991 to 2021

Year	Number of Mines	Production (short tons)
1991	40	1,346,284
1992	45	1,205,461
1993	48	900,621
1994	47	1,538,658
1995	54	1,350,789
1996	49	1,628,641
1997	42	1,767,649
1998	43	951,796
1999	42	1,168,922
2000	42	1,362,020
2001	38	813,733
2002	38	778,387
2003	38	1,222,324
2004	41	1,006,478
2005	38	1,419,411
2006	38	1,096,590
2007	40	1,262,464
2008	40	1,030,008
2009	36	564,550
2010	37	706,625
2011	35	836,042
2012	33	981,822
2013	31	788,011
2014	33	700,151
2015	33	868,413
2016	31	777,395
2017	30	830,169
2018	28	1,034,195
2019	28	714,731
2020	30	701,103
2021	29	780,674

Data for Figure 8. Specialty sand production from 1991 to 2021

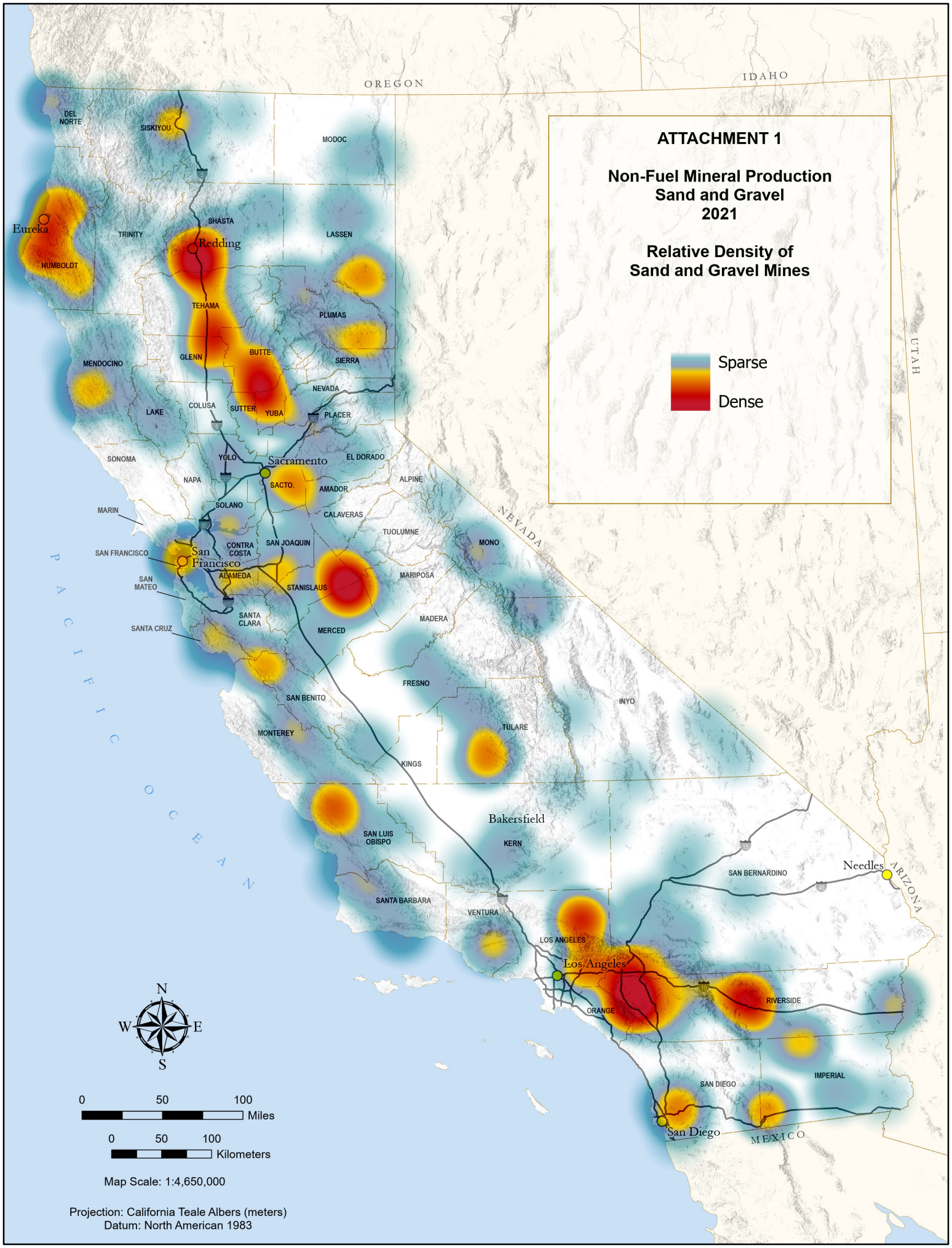
Year	Number of Mines	Production (short tons)
1991	6	753,420
1992	7	1,265,283
1993	6	1,095,358
1994	8	1,009,768
1995	6	816,918
1996	9	1,091,700
1997	10	1,223,179
1998	11	1,361,148
1999	7	927,883
2000	6	904,710
2001	10	1,092,178
2002	6	591,637
2003	6	932,026
2004	4	968,330
2005	3	986,418
2006	4	1,095,792
2007	5	1,027,093
2008	5	818,171
2009	5	689,779
2010	6	664,211
2011	8	845,899
2012	8	1,043,644
2013	6	545,221
2014	4	506,836
2015	5	976,410
2016	6	996,845
2017	7	963,564
2018	6	887,192
2019	6	805,824
2020	6	815,387
2021	7	1,027,634

Data for Figure 9. Gold production from 1991 to 2021

Year	Number of Mines	Production (troy ounces)
1991	29	1,182,567
1992	32	1,047,135
1993	34	1,276,494
1994	35	1,200,469
1995	29	1,422,156
1996	32	994,868
1997	32	1,058,169
1998	29	769,781
1999	26	807,605
2000	20	687,861
2001	22	542,576
2002	16	359,201
2003	13	141,055
2004	16	83,661
2005	30	80,010
2006	27	30,110
2007	24	33,161
2008	22	119,090
2009	21	165,842
2010	15	198,986
2011	17	198,057
2012	25	186,594
2013	29	146,463
2014	29	144,123
2015	23	160,767
2016	26	141,659
2017	22	221,110
2018	26	187,890
2019	21	183,474
2020	22	195,176
2021	24	217,460

Data for Figure 10. Silver production from 1991 to 2021

Year	Number of Mines	Production (troy ounces)
1991	18	684,054
1992	17	625,607
1993	15	615,400
1994	17	469,189
1995	13	469,986
1996	13	677,425
1997	16	657,591
1998	17	385,311
1999	12	302,299
2000	11	290,608
2001	8	237,936
2002	6	89,561
2003	4	17,619
2004	4	2,915
2005	15	7,698
2006	13	3,345
2007	11	3,397
2008	9	3,664
2009	7	11,061
2010	6	24,093
2011	6	20,604
2012	5	21,325
2013	10	13,998
2014	8	12,376
2015	4	12,454
2016	7	200,227
2017	8	251,786
2018	10	407,559
2019	9	500,195
2020	10	701,429
2021	8	686,816


ATTACHMENT 1
Non-Fuel Mineral Production
Sand and Gravel
2021
Relative Density of
Sand and Gravel Mines
Sparse
Dense
OREGON
IDAHO
NEVADA
UTAH
ARIZONA
MEXICO
PACIFIC OCEAN
DEL NORTE
SISKIYOU
MODOC
Eureka
TRINITY
SHASTA
Redding
LASSEN
HUMBOLDT
TEHAMA
PLUMAS
MENDOCINO
GLENN
BUTTE
SIERRA
NEVADA
LAKE
COLUSA
SUTTER
YUBA
PLACER
SONOMA
YOLO
Sacramento
EL DORADO
NAPA
SACTO.
AMADOR
ALPINE
SOLANO
CALAVERAS
MARIN
TUOLUMNE
MONO
SAN FRANCISCO
CONTRA COSTA
SAN JOAQUIN
San Francisco
ALAMEDA
MARIPOSA
SAN MATEO
STANISLAUS
SANTA CLARA
MADERA
SANTA CRUZ
MERCED
FRESNO
SAN BENITO
INYO
MONTEREY
TULARE
KINGS
Bakersfield
SAN LUIS OBISPO
KERN
SAN BERNARDINO
Needles
SANTA BARBARA
VENTURA
LOS ANGELES
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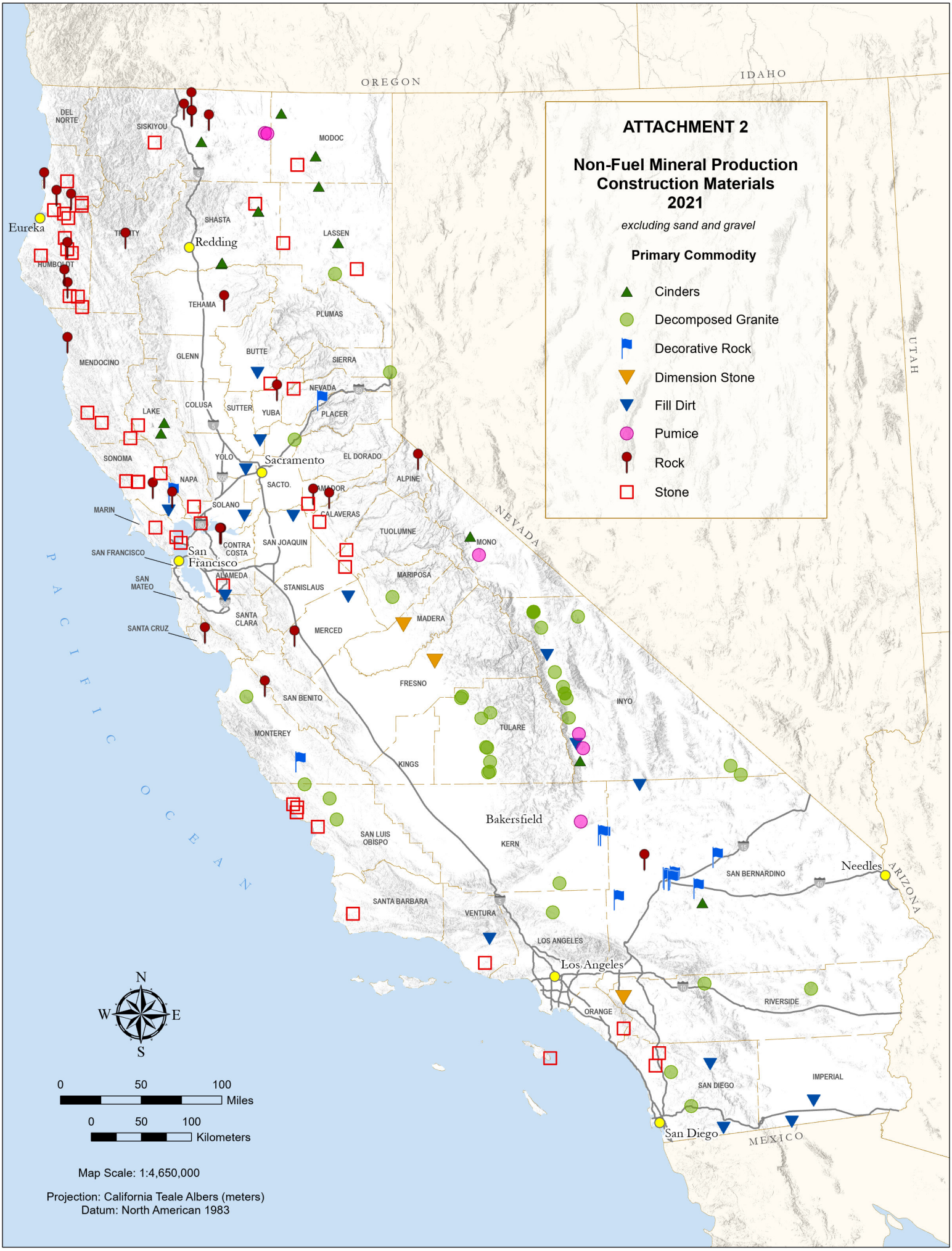
Kilometers
Map Scale: 1:4,650,000
Projection: California Teale Albers (meters)
Datum: North American 1983


ATTACHMENT 2
Non-Fuel Mineral Production
Construction Materials
2021
excluding sand and gravel
Primary Commodity
Cinders
Decomposed Granite
Decorative Rock
Dimension Stone
Fill Dirt
Pumice
Rock
Stone
OREGON
IDAHO
UTAH
NEVADA
ARIZONA
MEXICO
PACIFIC OCEAN
DEL NORTE
SISKIYOU
MODOC
HUMBOLDT
TRINITY
SHASTA
LASSEN
Eureka
Redding
TEHAMA
PLUMAS
MENDOCINO
GLENN
BUTTE
SIERRA
NEVADA
PLACER
LAKE
COLUSA
SUTTER
YUBA
SONOMA
YOLO
Sacramento
EL DORADO
NAPA
SACTO.
AMADOR
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CALAVERAS
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TUOLUMNE
MONO
CONTRA COSTA
SAN JOAQUIN
SAN FRANCISCO
San Francisco
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SAN MATEO
STANISLAUS
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MADERA
SANTA CRUZ
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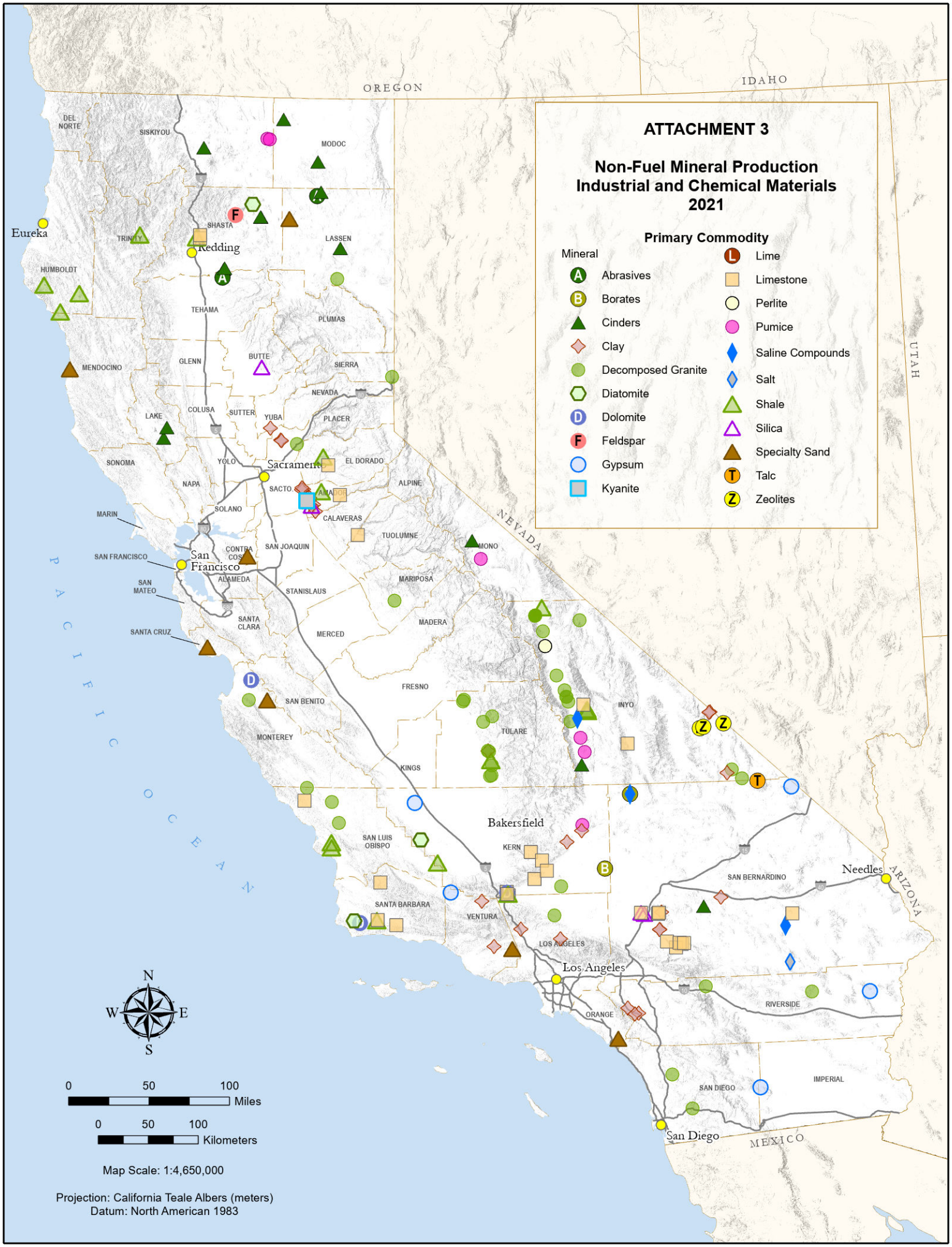
ATTACHMENT 3
Non-Fuel Mineral Production
Industrial and Chemical Materials
2021
Primary Commodity
Mineral
Abrasives
Borates
Cinders
Clay
Decomposed Granite
Diatomite
Dolomite
Feldspar
Gypsum
Kyanite
Lime
Limestone
Perlite
Pumice
Saline Compounds
Salt
Shale
Silica
Specialty Sand
Talc
Zeolites
OREGON
IDAHO
NEVADA
UTAH
ARIZONA
MEXICO
PACIFIC OCEAN
Eureka
Redding
Sacramento
San Francisco
Bakersfield
Needles
Los Angeles
San Diego
DEL NORTE
SISKIYOU
MODOC
HUMBOLDT
TRINITY
SHASTA
LASSEN
TEHAMA
PLUMAS
MENDOCINO
GLENN
BUTTE
SIERRA
NEVADA
LAKE
COLUSA
SUTTER
YUBA
PLACER
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YOLO
EL DORADO
NAPA
SACTO.
AMA.
JOA.
ALPINE
SOLANO
CALAVERAS
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SAN JOAQUIN
SAN MATEO
ALAMEDA
STANISLAUS
MARIPOSA
SANTA CLARA
MADERA
SANTA CRUZ
MERCED
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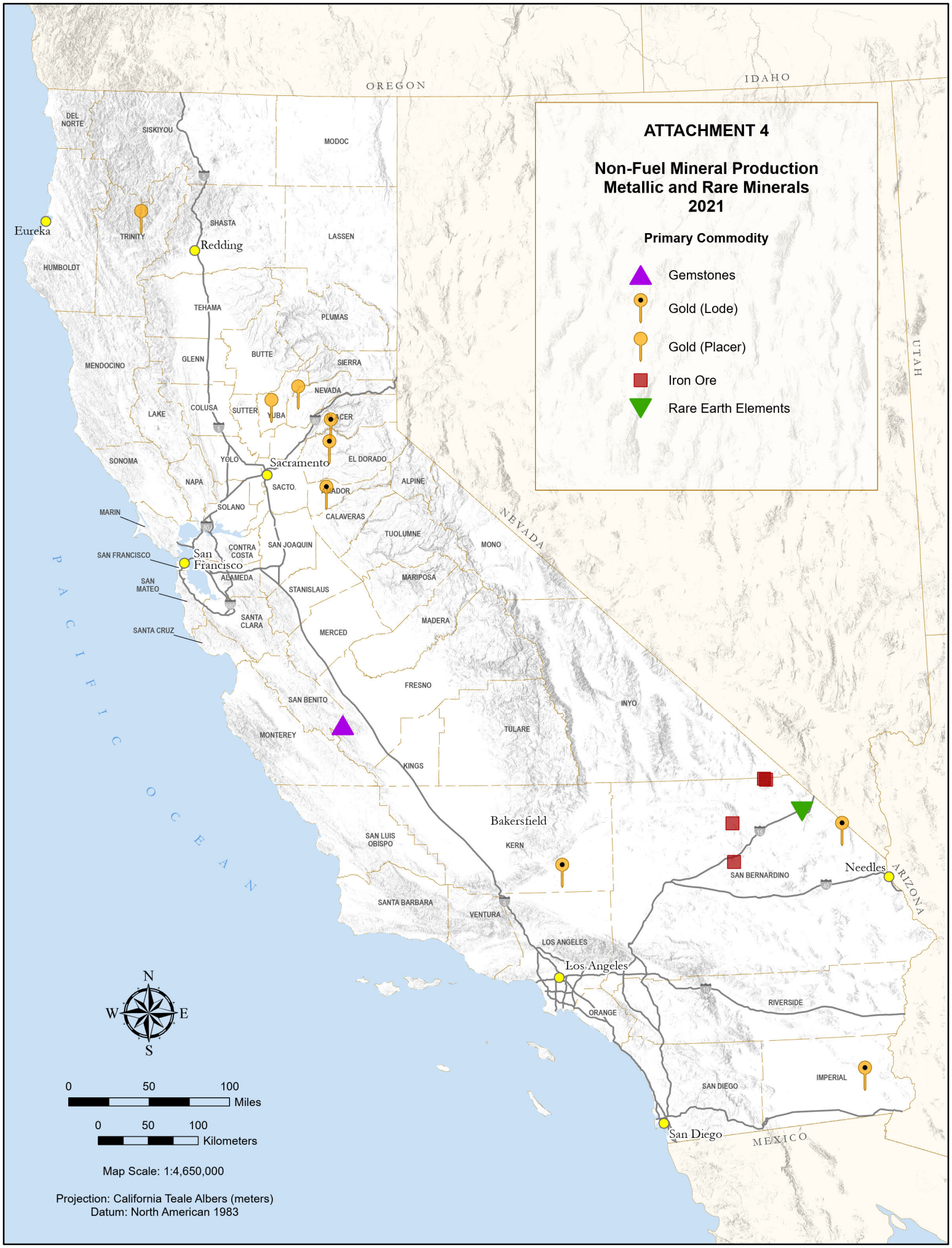
ATTACHMENT 4
Non-Fuel Mineral Production
Metallic and Rare Minerals
2021
Primary Commodity
Gemstones
Gold (Lode)
Gold (Placer)
Iron Ore
Rare Earth Elements
OREGON
IDAHO
NEVADA
UTAH
ARIZONA
MEXICO
PACIFIC OCEAN
DEL NORTE
SISKIYOU
MODOC
HUMBOLDT
TRINITY
SHASTA
LASSEN
Eureka
Redding
TEHAMA
PLUMAS
MENDOCINO
GLENN
BUTTE
SIERRA
NEVADA
LAKE
COLUSA
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MARIN
TUOLUMNE
MONO
SAN FRANCISCO
CONTRA COSTA
SAN JOAQUIN
San Francisco
ALAMEDA
MARIPOSA
SAN MATEO
STANISLAUS
SANTA CLARA
MADERA
SANTA CRUZ
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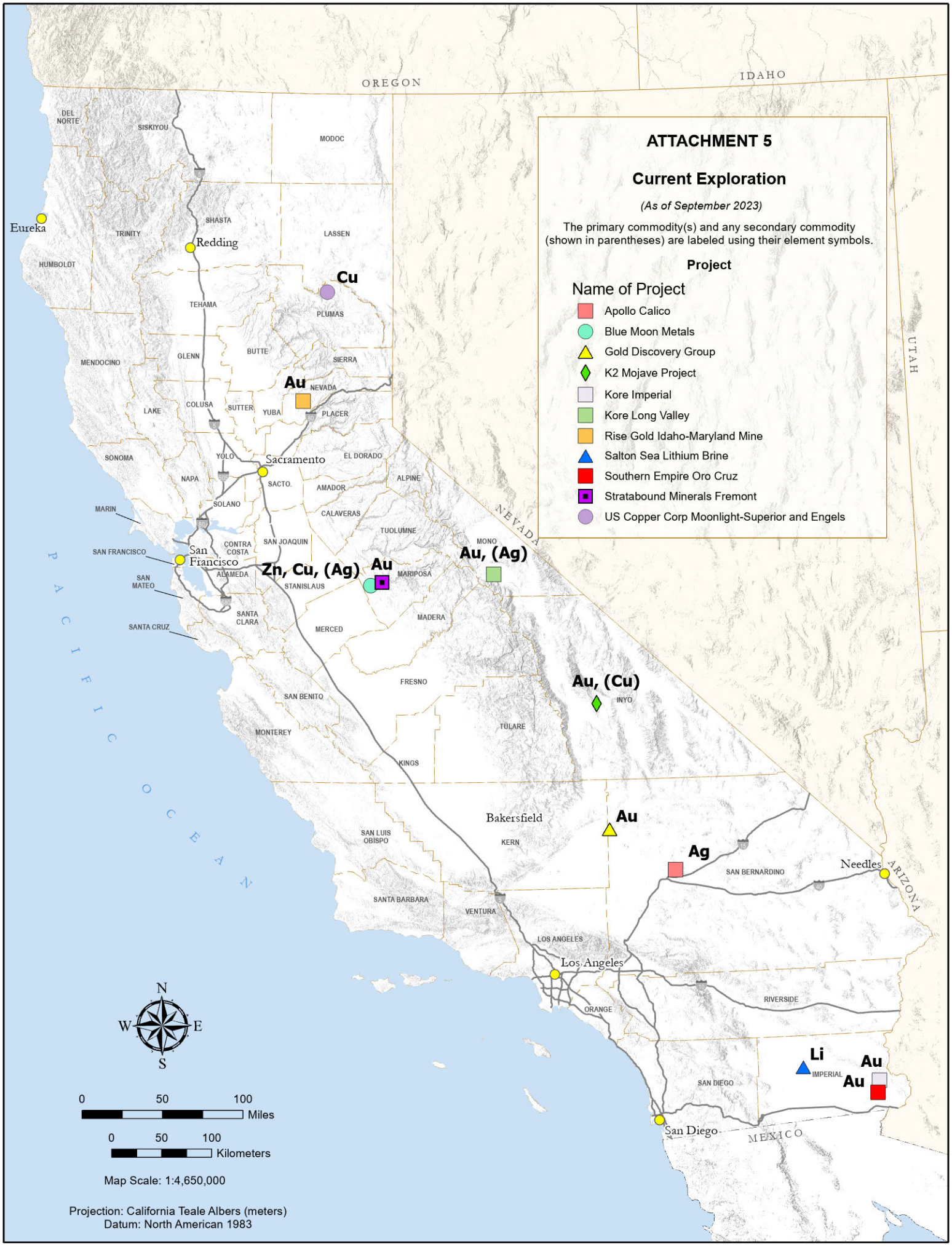
ATTACHMENT 5
Current Exploration
(As of September 2023)
The primary commodity(s) and any secondary commodity (shown in parentheses) are labeled using their element symbols.
Project
Name of Project
Apollo Calico
Blue Moon Metals
Gold Discovery Group
K2 Mojave Project
Kore Imperial
Kore Long Valley
Rise Gold Idaho-Maryland Mine
Salton Sea Lithium Brine
Southern Empire Oro Cruz
Stratabound Minerals Fremont
US Copper Corp Moonlight-Superior and Engels
OREGON
IDAHO
NEVADA
UTAH
ARIZONA
MEXICO
PACIFIC OCEAN
Eureka
Redding
Sacramento
San Francisco
Bakersfield
Needles
Los Angeles
San Diego
Cu
Au
Zn, Cu, (Ag)
Au
Au, (Ag)
Au, (Cu)
Au
Ag
Li
Au
Au
N
W
E
S
0 50 100 Miles
0 50 100 Kilometers
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