



California
**Department of
Conservation**

Aggregate Sustainability

California Geological Survey

Fred W. Gius, CEG
Supervising Engineering Geologist
Mineral Resources Program
fred.gius@conservation.ca.gov
(916) 322-2719

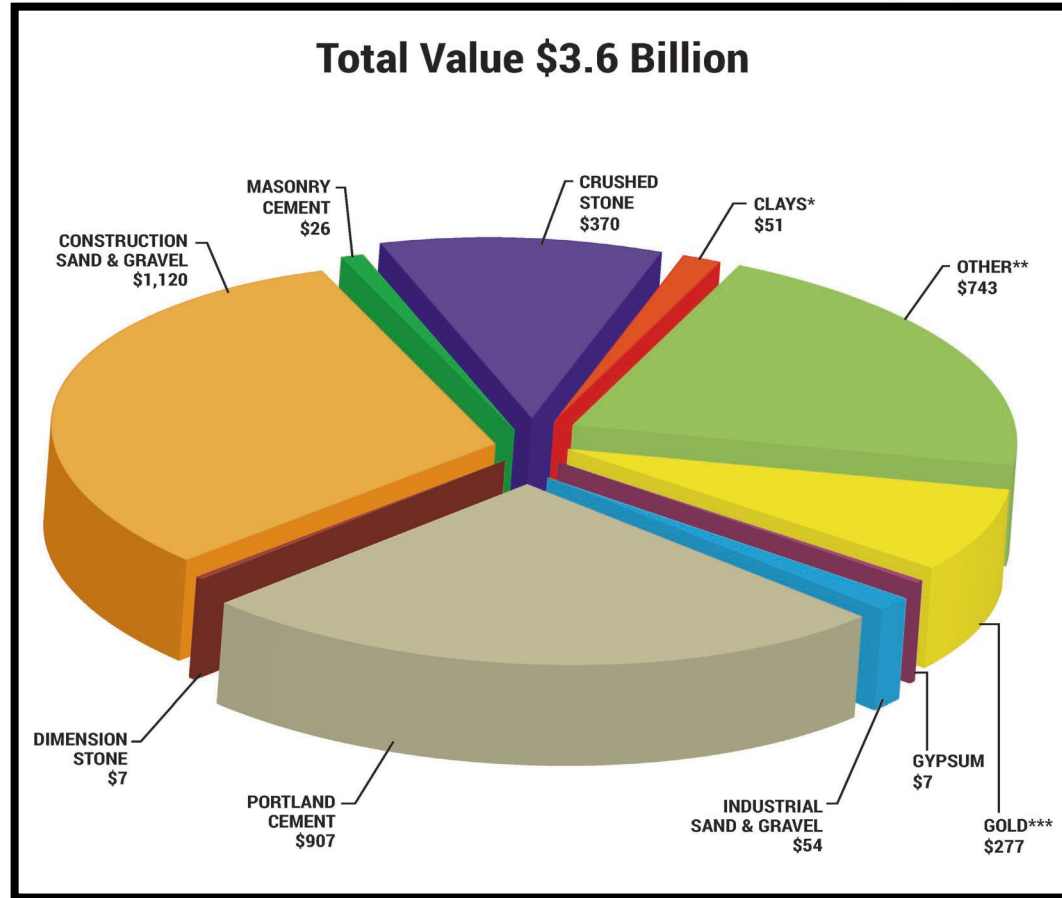
CA NON-FUEL MINERAL PRODUCTION 2017

28 minerals are produced commercially from about 660 actively working mines.

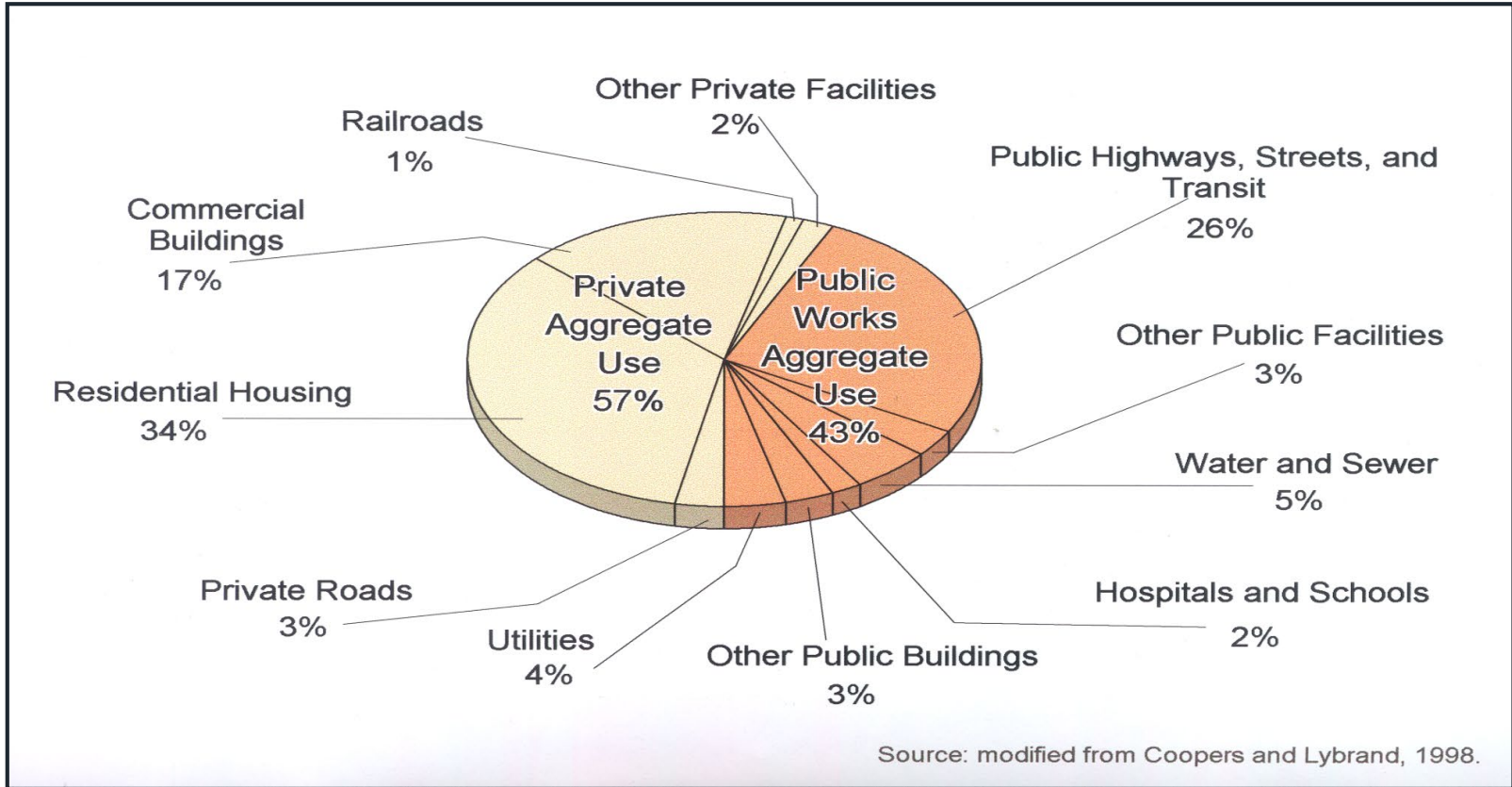
Ranked 5th in Nation in total value.

Led Nation in production of S&G, boron, rare earths, and diatomite.

California produces a greater variety of minerals than any other state.



WHO USES CONSTRUCTION AGGREGATE



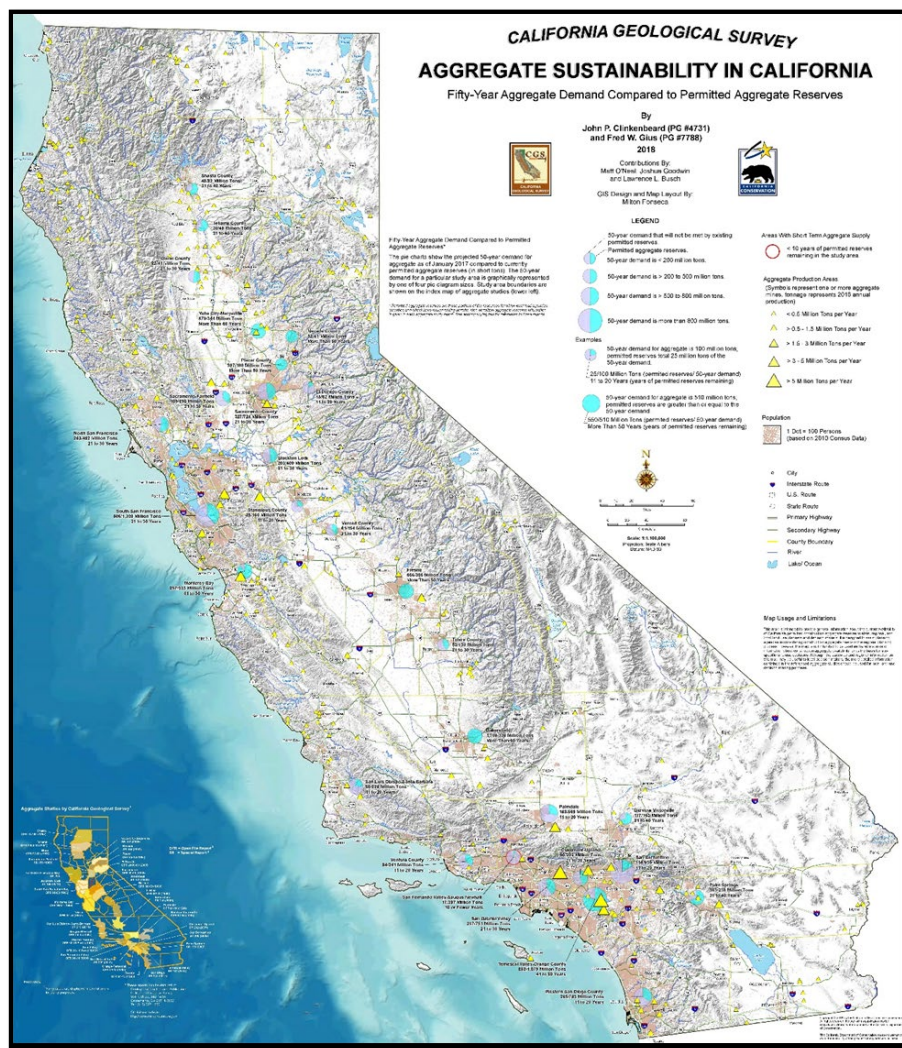
Source: modified from Coopers and Lybrand, 1998.

NOT ALL ROCK IS CREATED EQUAL

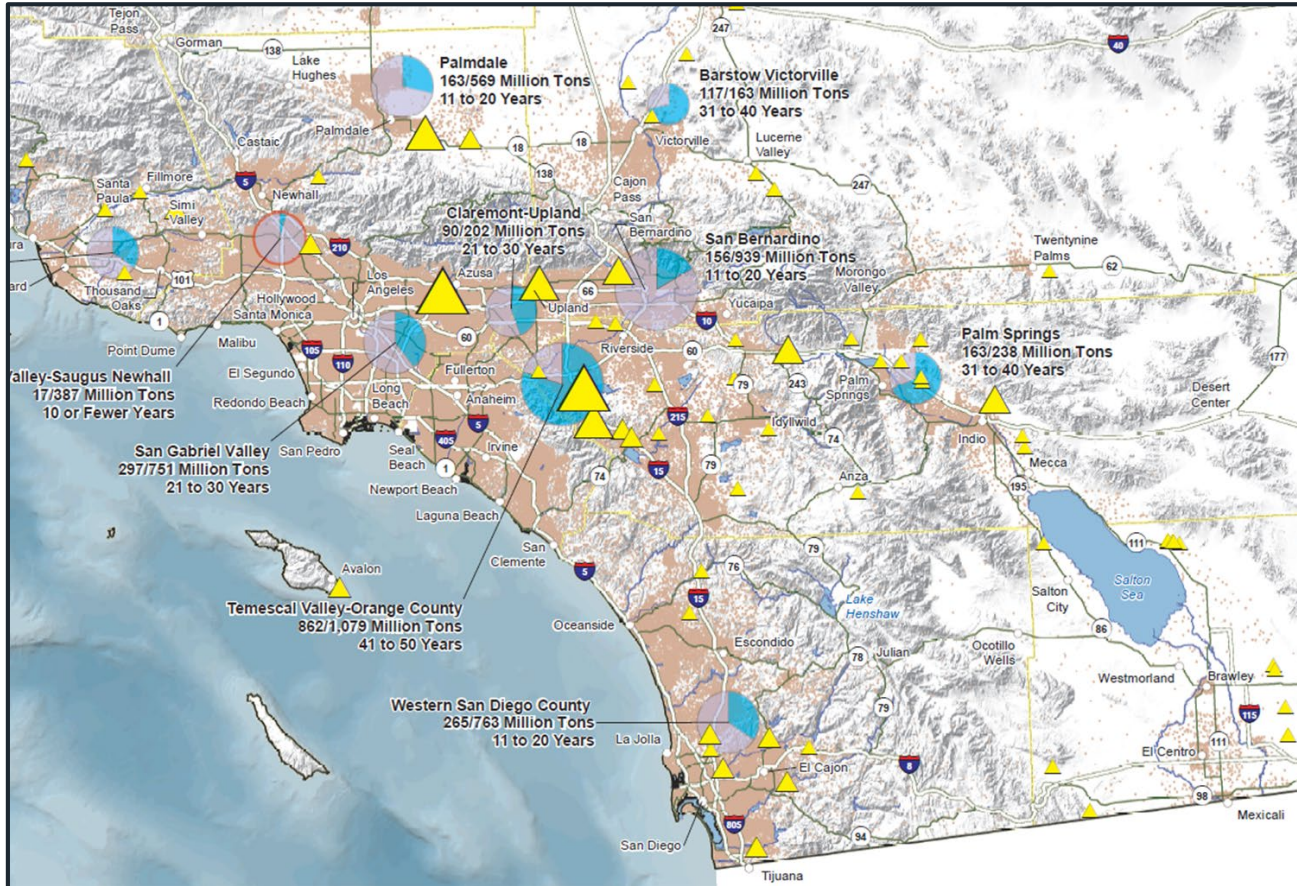


2018 AGGREGATE SUSTAINABILITY MAP

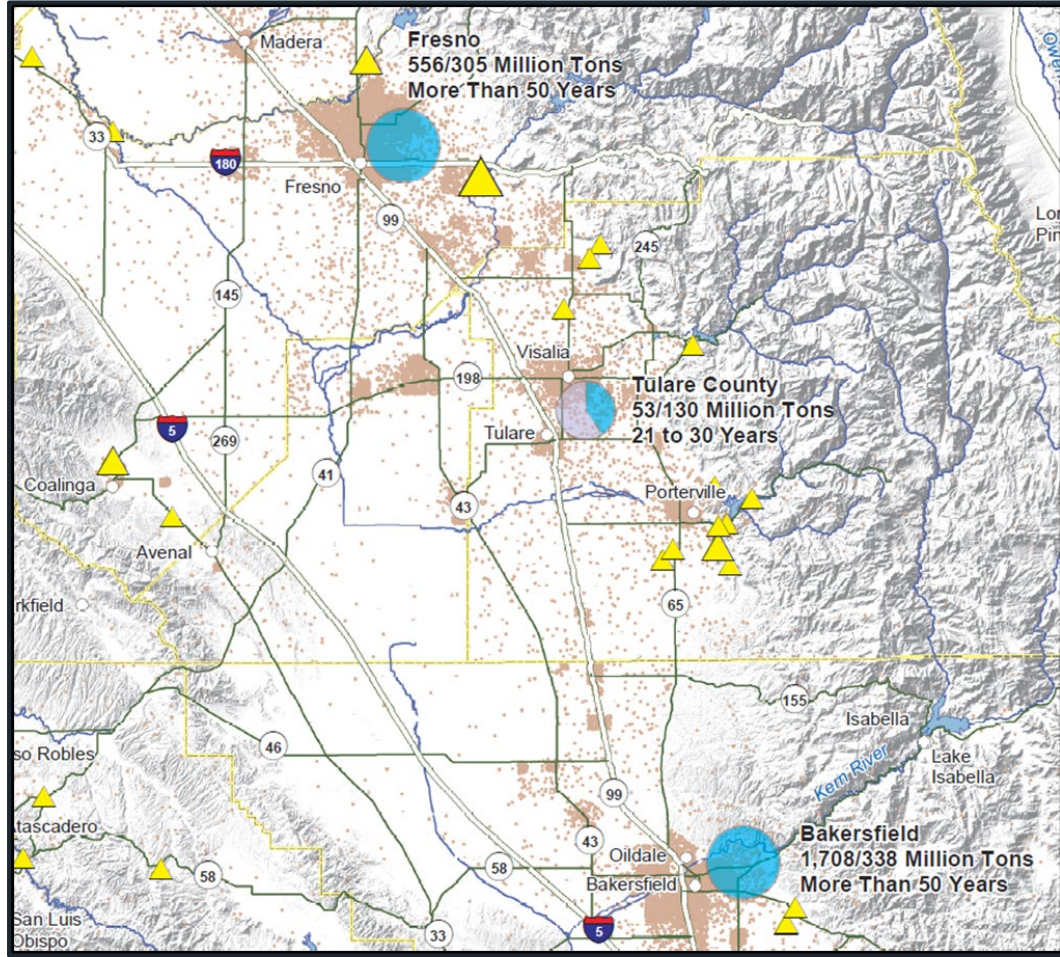
California's New Gold



SOUTHERN CALIFORNIA

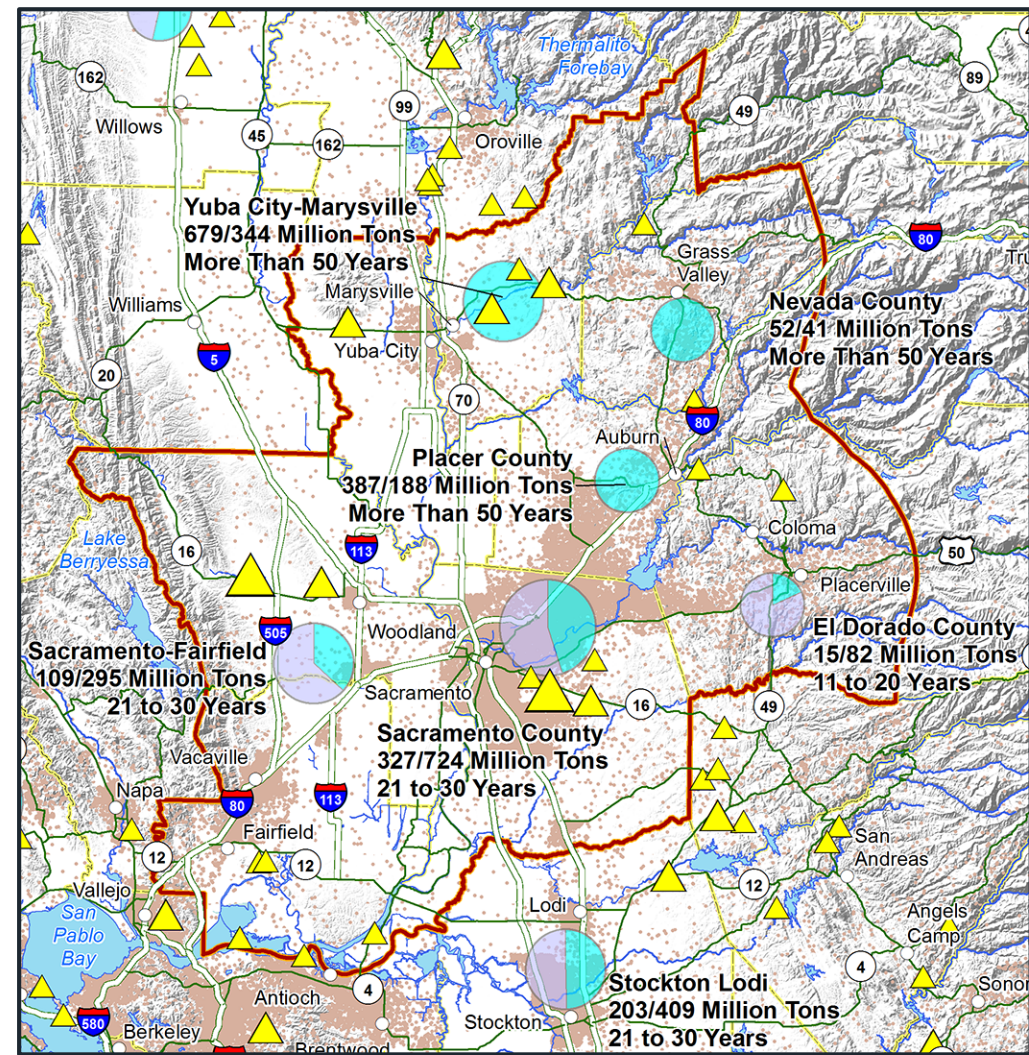


FRESNO BAKERSFIELD



GREATER SACRAMENTO AREA

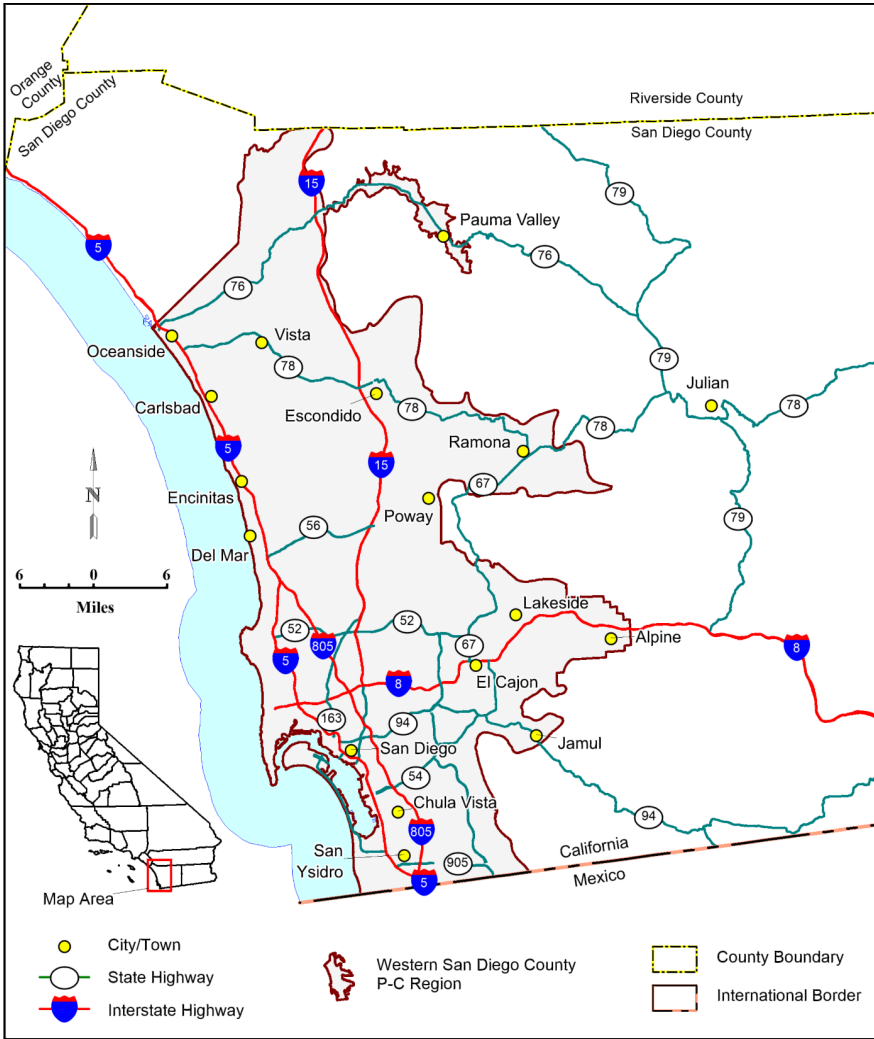
1.5 bt reserves
1.4 bt demand



MS 52 UPDATE COMPARISON

	2002	2006	2012	2018
Permitted Reserves (billion tons)	6.8	4.3	4.1	7.6
50-Year Demand (billion tons)	12	13.5	12	11
Areas with Adequate Reserves	6	1	1	5
Resources (billion tons)	74			

SPECIAL REPORT 240: MINERAL LAND CLASSIFICATION WESTERN SAN DIEGO COUNTY P-C REGION



MINERAL LAND CLASSIFICATION



The primary goal of Mineral Land Classification is to ensure that the mineral resource potential of lands in California is recognized and considered in the land-use planning process.

AGGREGATE CLASSIFICATION METHODOLOGY

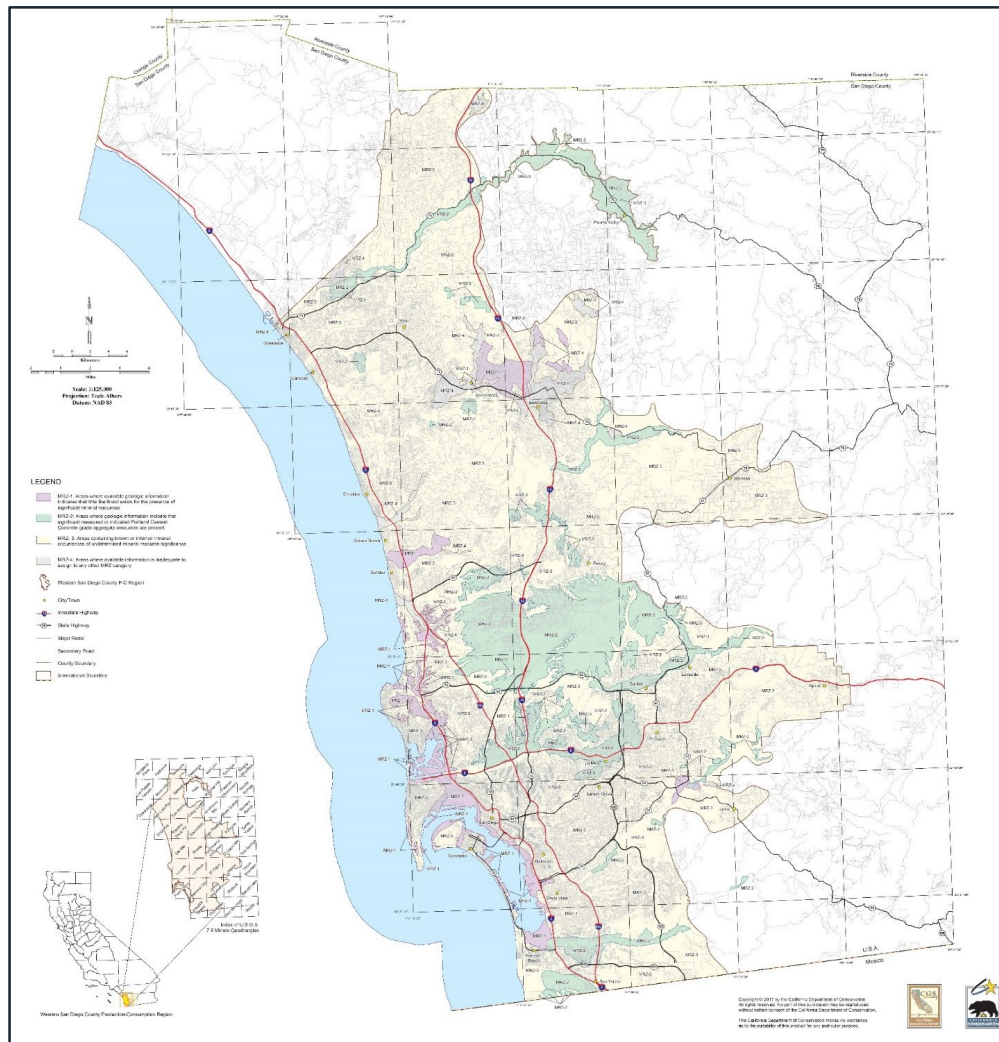


- **Study boundary**
- **Mineral Resource Zones (MRZs)**
- **Resource Sectors**
- **Quantify resources and reserves**
- **Forecast 50-year aggregate needs**
- **Project lifespan of current reserves**

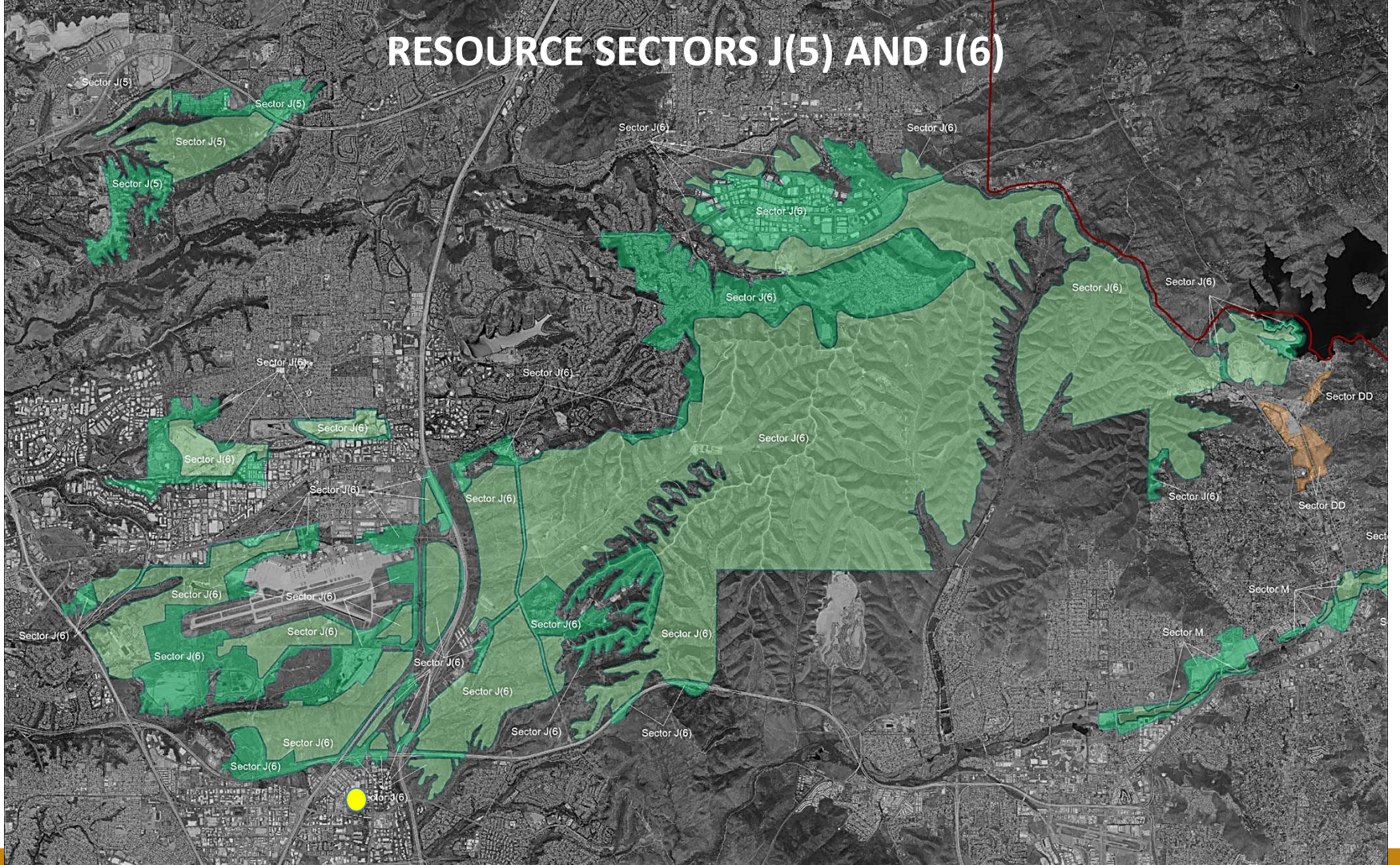
CLASSIFICATION CATEGORIES - SIMPLIFIED

MRZ- 1	No Resource
MRZ- 2	Resource
MRZ- 3	Suspected Resource
MRZ- 4	Unknown

MINERAL RESOURCE ZONES



RESOURCE SECTORS J(5) AND J(6)

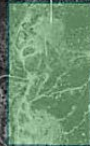


RESOURCE SECTORS BB AND CC

Sector BB



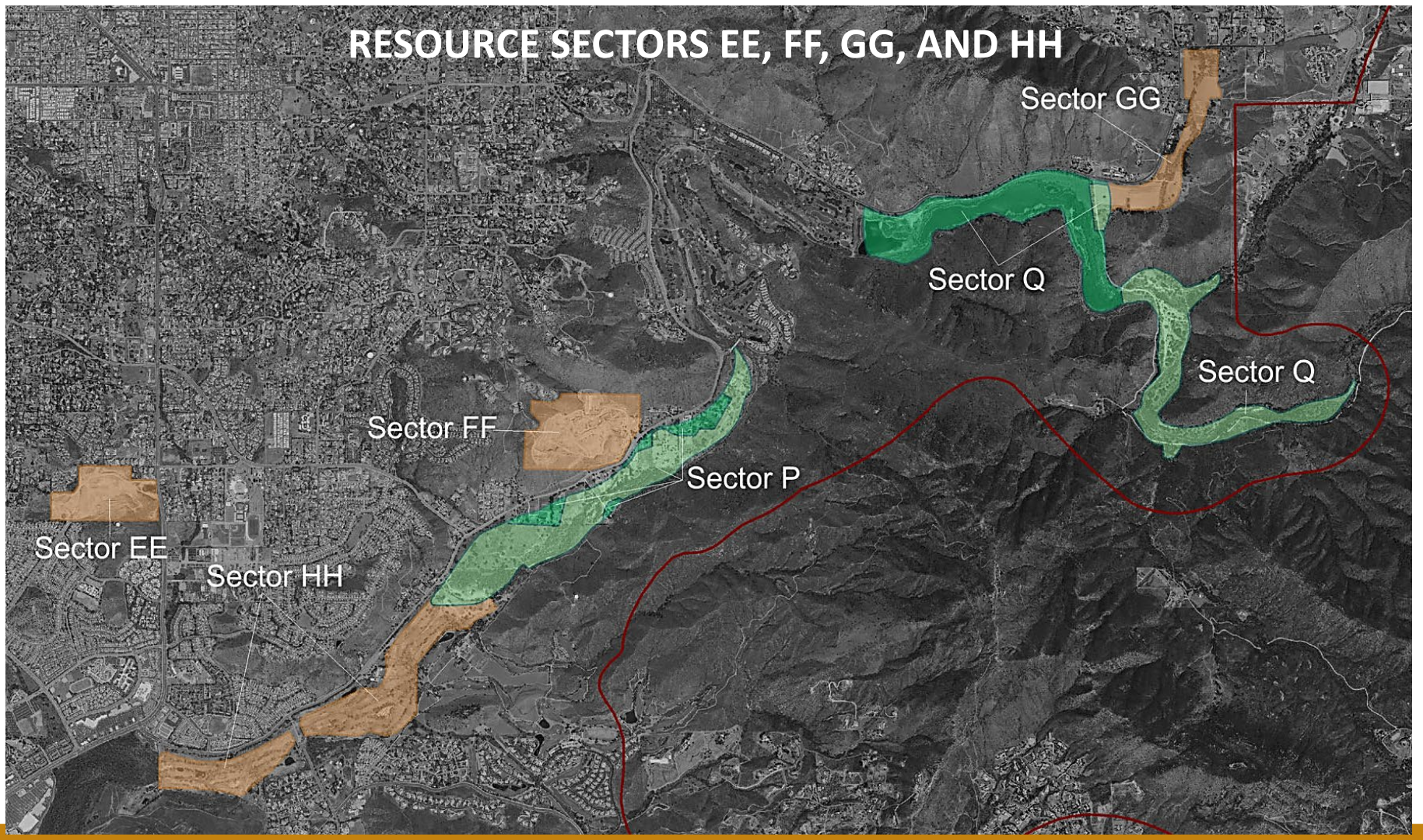
Sector H



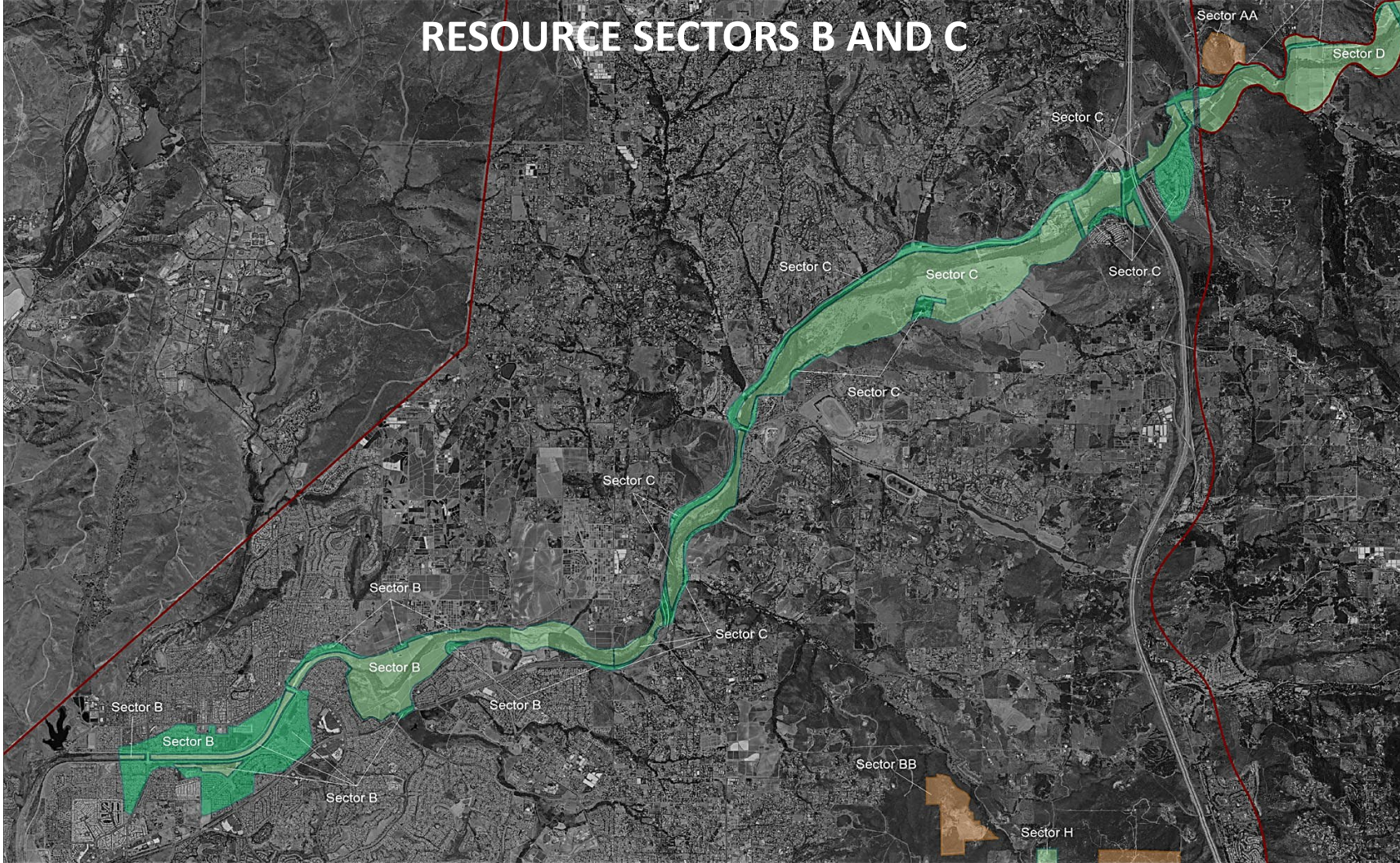
Sector CC



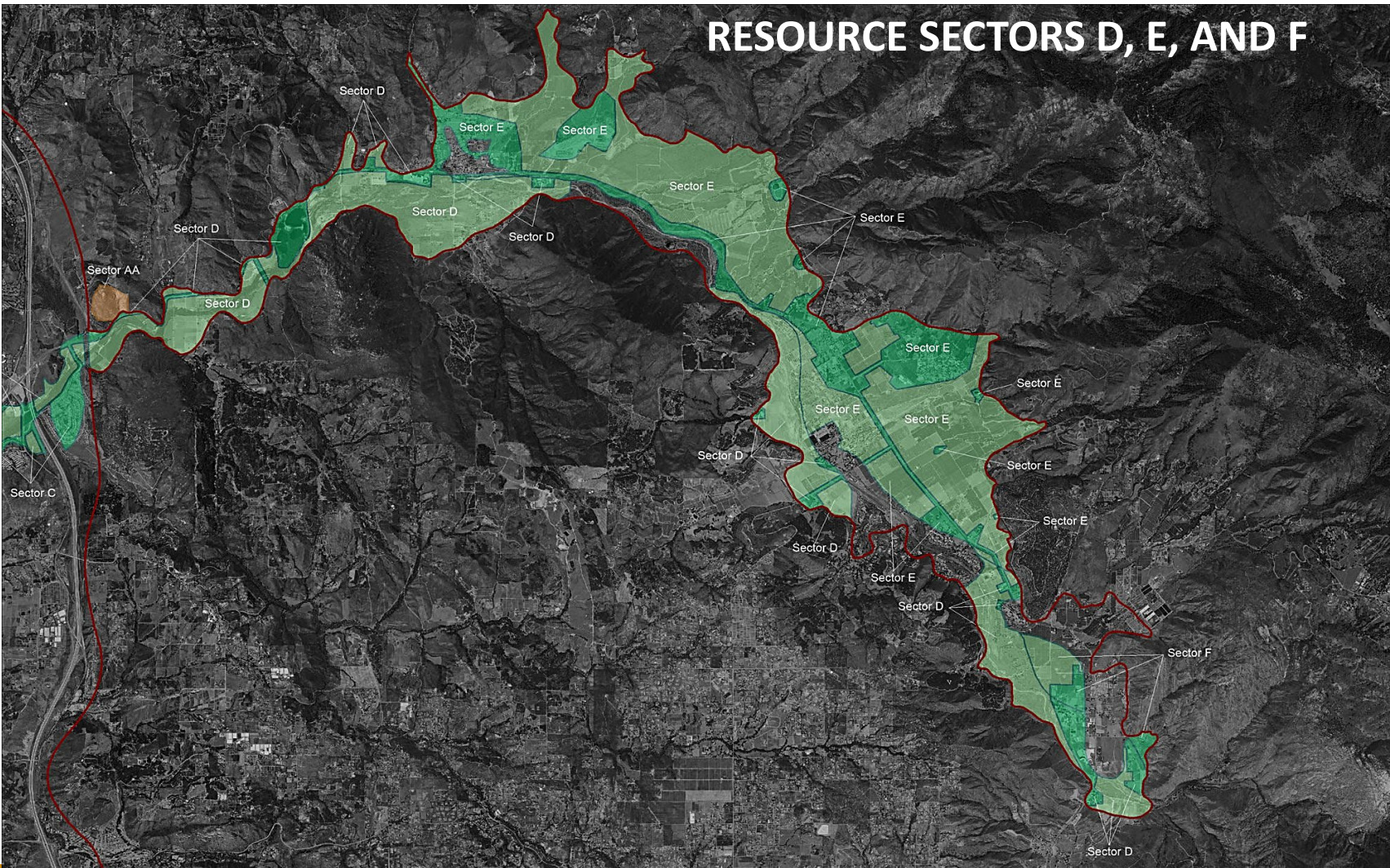
RESOURCE SECTORS EE, FF, GG, AND HH



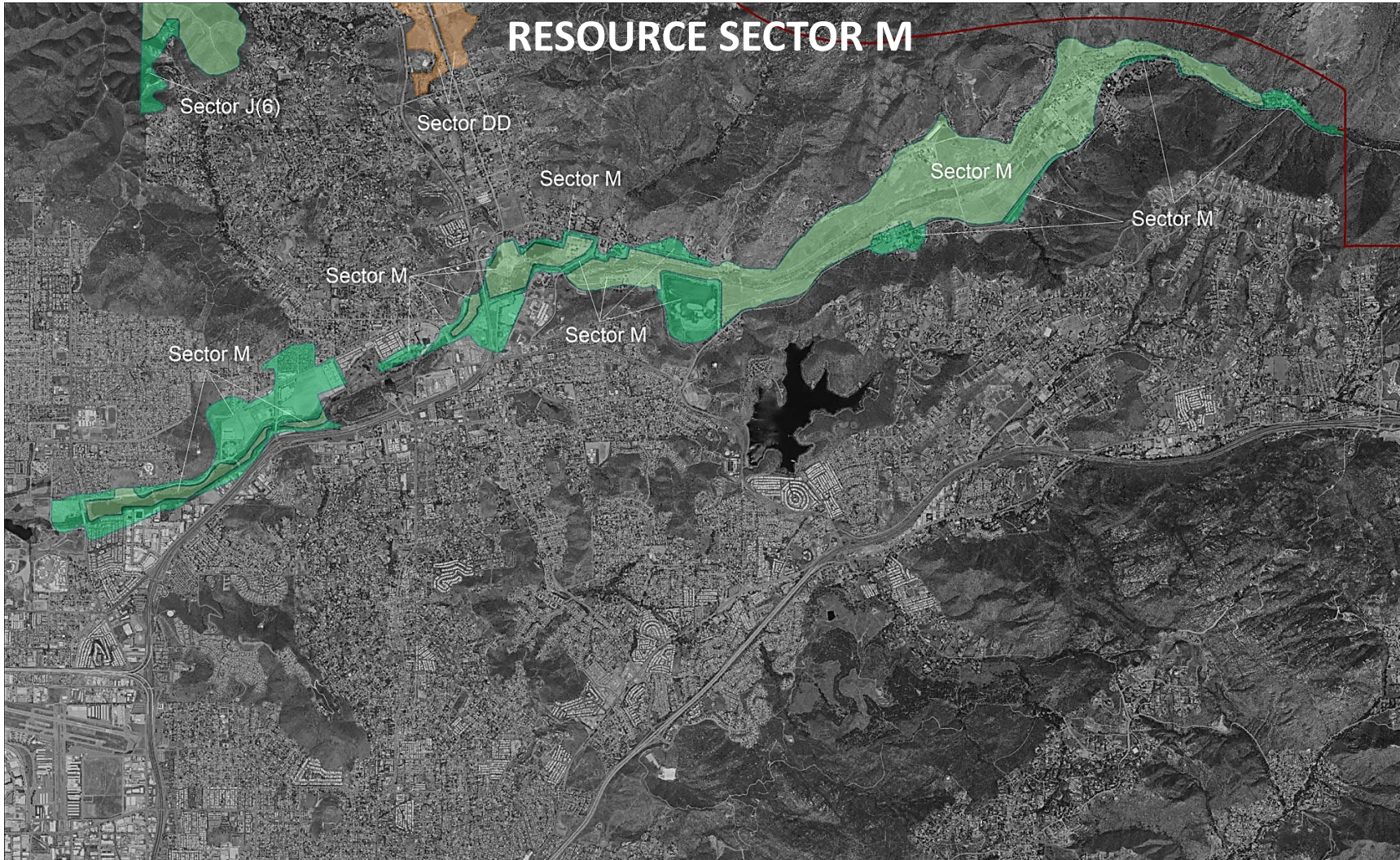
RESOURCE SECTORS B AND C



RESOURCE SECTORS D, E, AND F



RESOURCE SECTOR M



Sector J(6)

Sector DD

Sector M

Sector M

Sector M

Sector M

Sector M

Sector M

RESOURCE SECTOR J(1)



PER-CAPITA CONSTRUCTION AGGREGATE DEMAND PROJECTION



Basis for Projection

- Historic Construction aggregate production (consumption)
- Historic population
- $\text{Production} \div \text{Population} = \text{Average Annual Per-Capita consumption}$
- $\text{Population Projection} \times \text{Per-Capita rate} = \text{Demand Projection}$

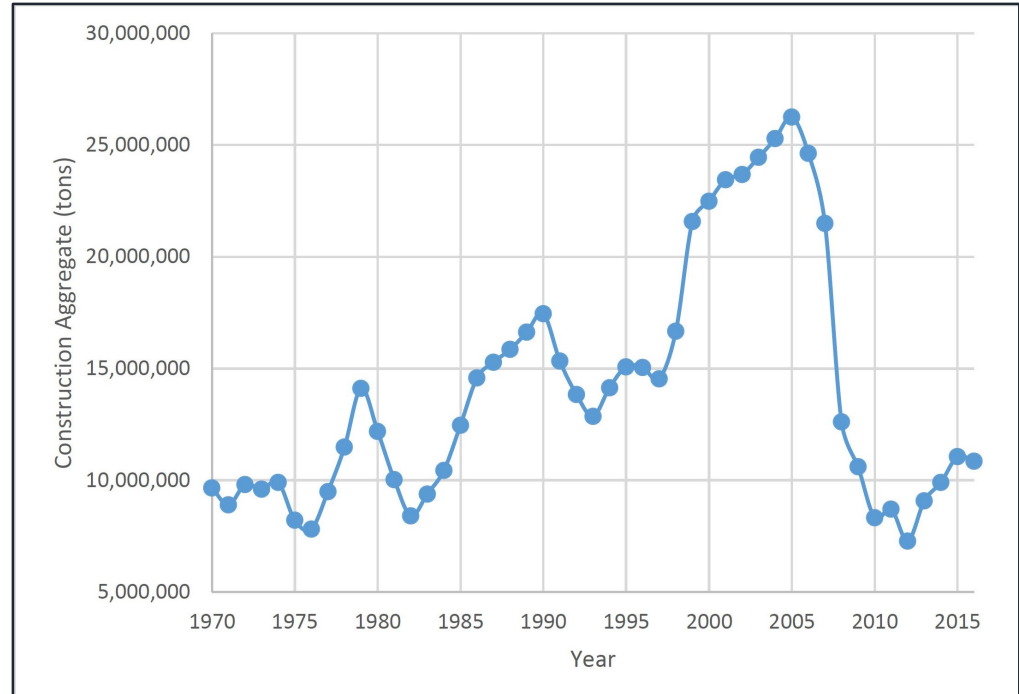
DEMAND PROJECTION INPUT: HISTORIC PRODUCTION

Years 1970 – 1990 Compilation Sources

US Bureau of Mines
Mine Operators
Source Report Files

Years 1990 – 2016 Compilation Sources:

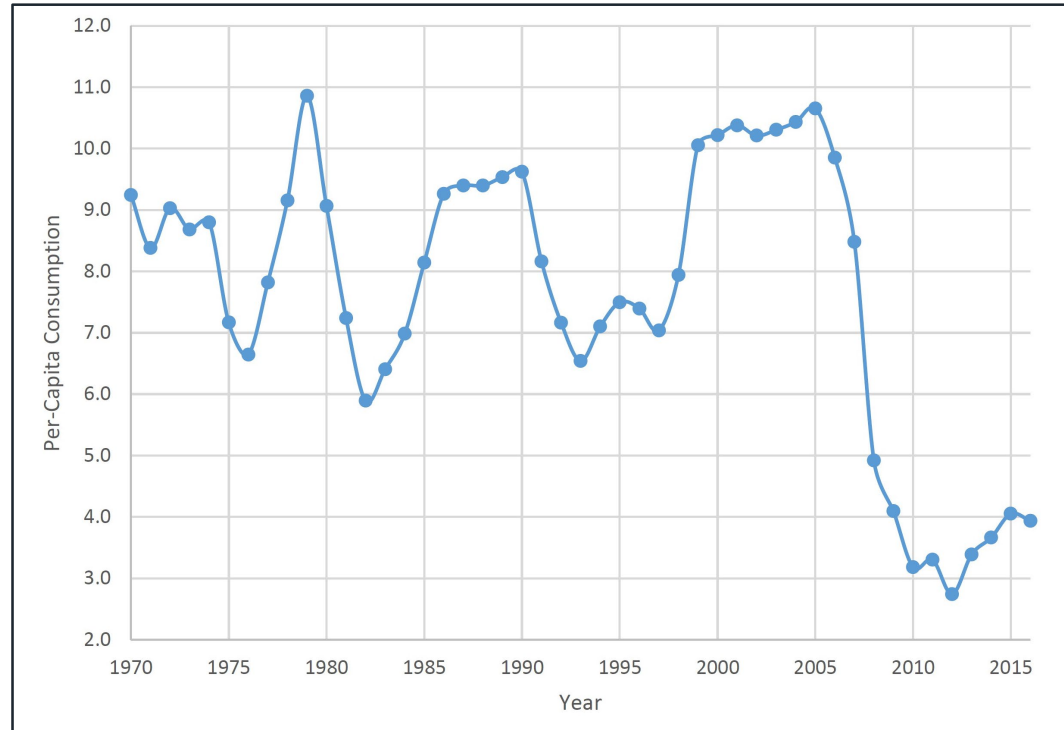
California Division of Mine Reclamation



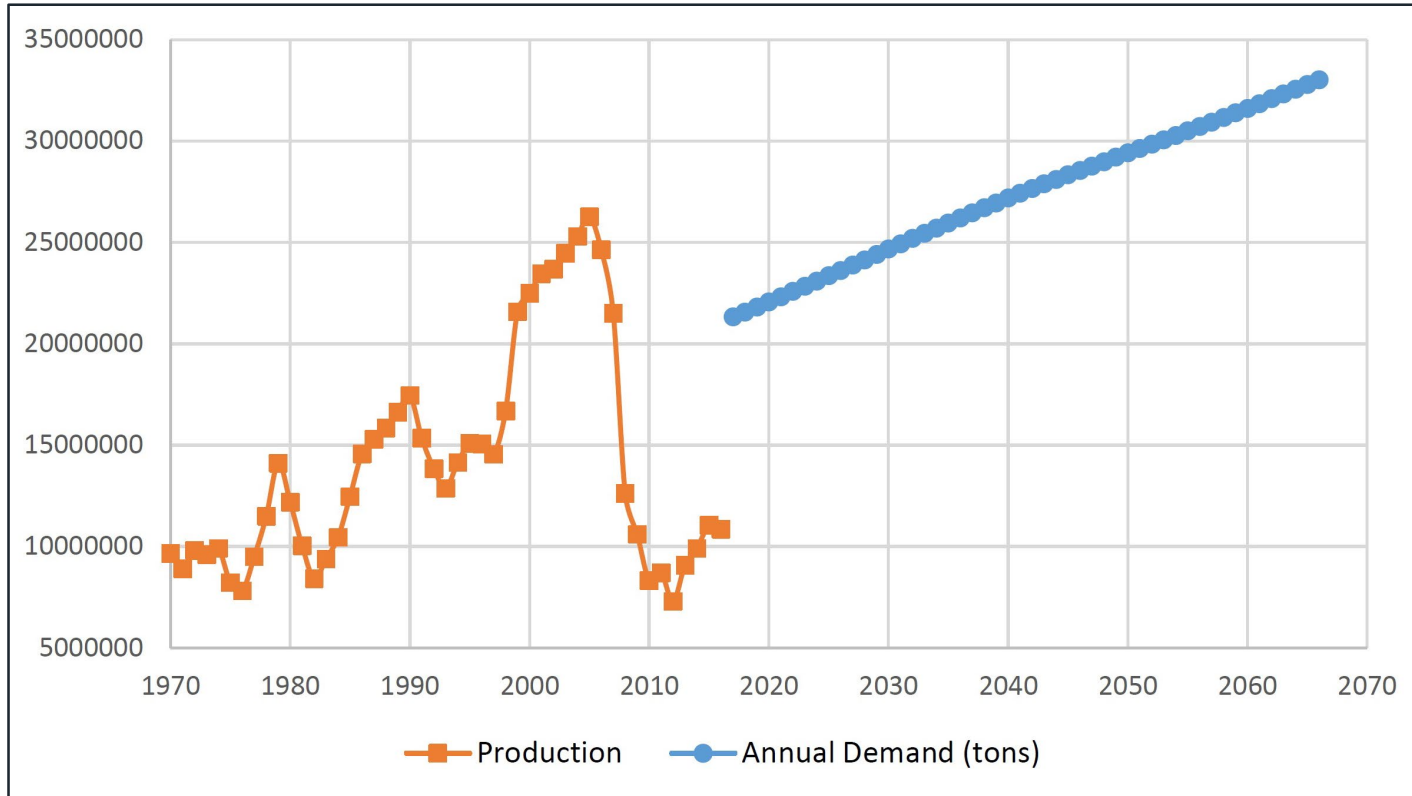
DEMAND PROJECTION INPUT: PER-CAPITA CONSUMPTION

Average Annual Per-Capita Consumption

$$= \text{Production} \div \text{Population}$$



DEMAND PROJECTION AND RESOURCE SUMMARY

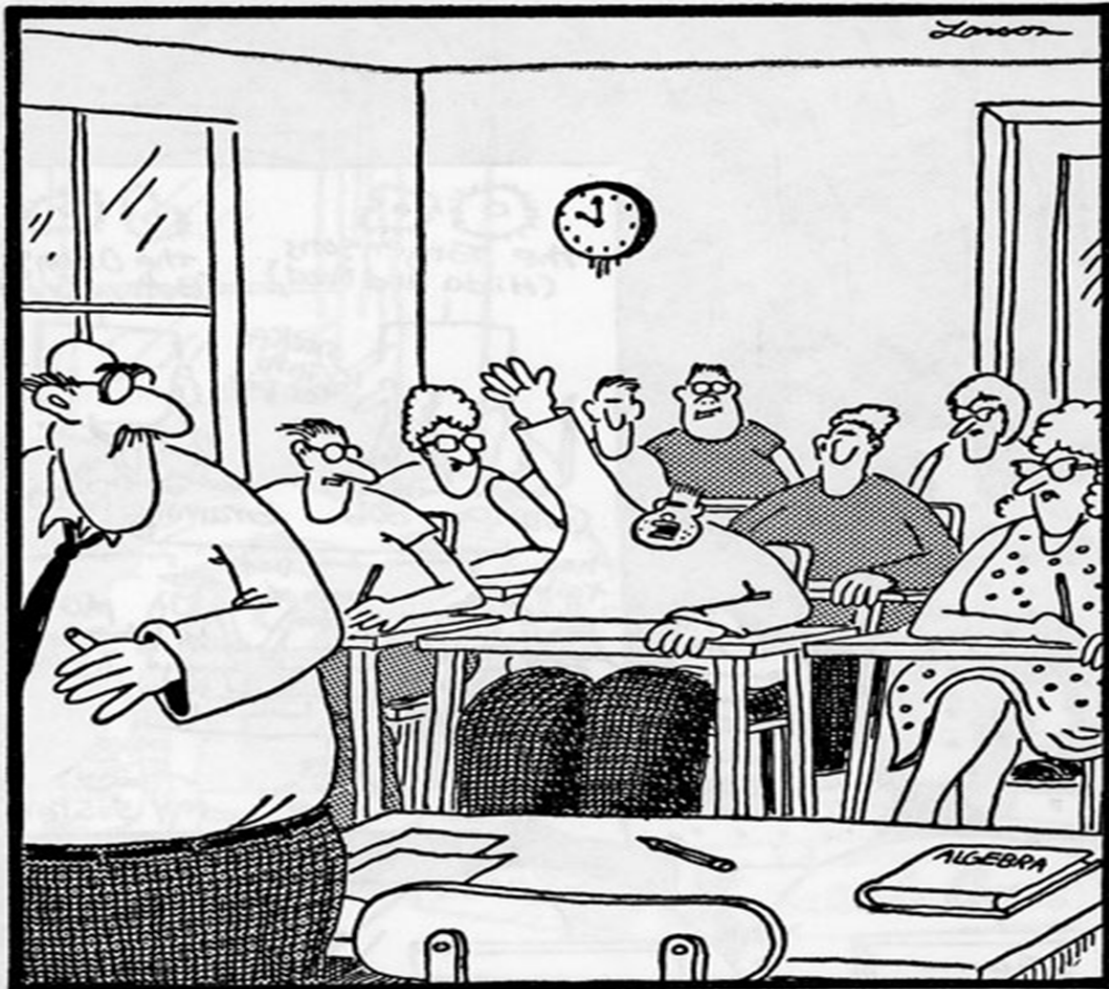


SUMMARY OF WESTERN SAN DIEGO COUNTY RESOURCES



Aggregate Resources (PCC-grade)	5,982 Million Tons
Aggregate Reserves (PCC-grade)	271 Million Tons
Projected 50-Year Aggregate Demand	760 Million Tons
Estimated Depletion Date of Reserves	2035

London



QUESTIONS?

"Mr. Osborne, may I be excused? My brain is full."