

Caso de estudio: Almadén, la cuna mundial del mercurio

Pablo Higuera¹, José M. Esbrí², Saturnino Lorenzo¹, Javier Carrasco³,
Angel Hernández³

¹ Instituto de Geología Aplicada, Universidad de Castilla-La Mancha, EIMI Almadén, Pl. Manuel Meca, 1
pablo.higuera@uclm.es; saturnino.lorenzo@uclm.es.

² Departamento de Mineralogía y Petrología, Facultad de Ciencias Geológicas, Universidad Complutense de Madrid.
jesbri@ucm.es

³ Minas de Almadén y Arrayanes S.A. Cerco de San Teodoro s/n, Almadén. fcojavier.carrasco@mayasa.es;
ahsobrino@gmail.com

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Almadén – The Mine

- Al maden means the mine in arab (and also in Turkish)



Almadén – The Mine

- Almadén is the only mine in the world having produced some one third of one element: mercury (Rytuba, 2003)

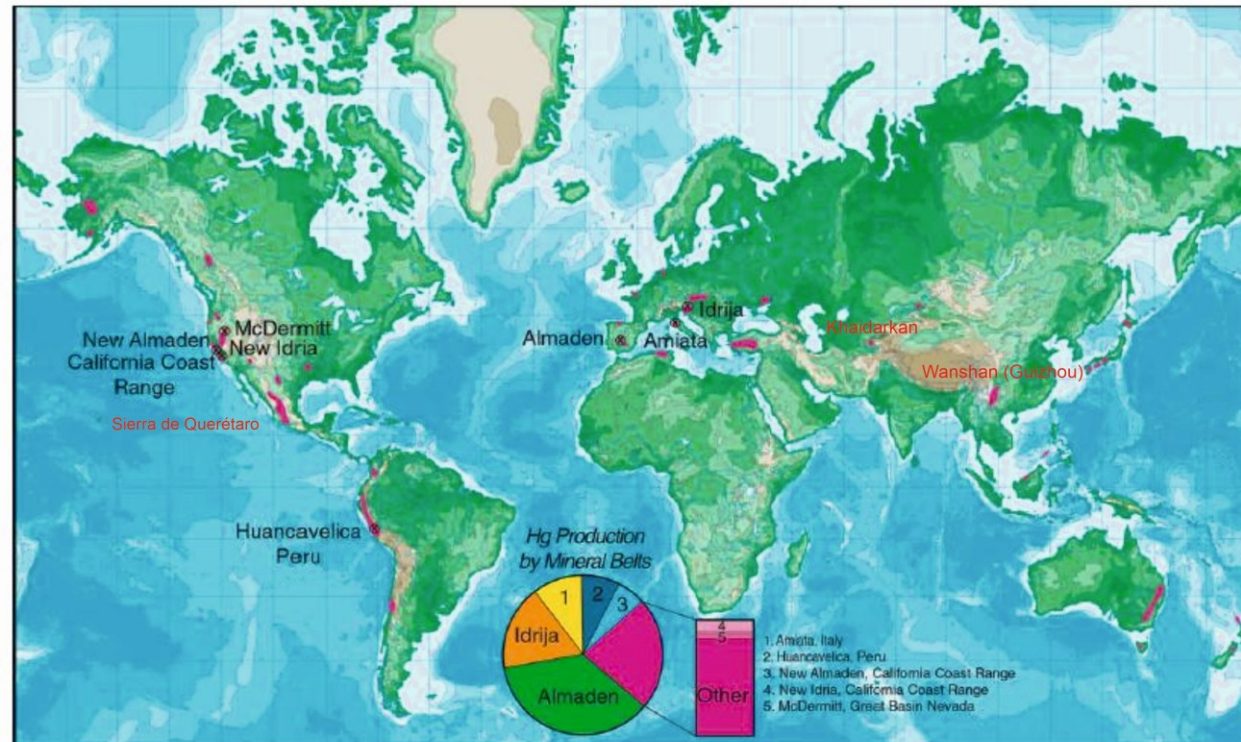


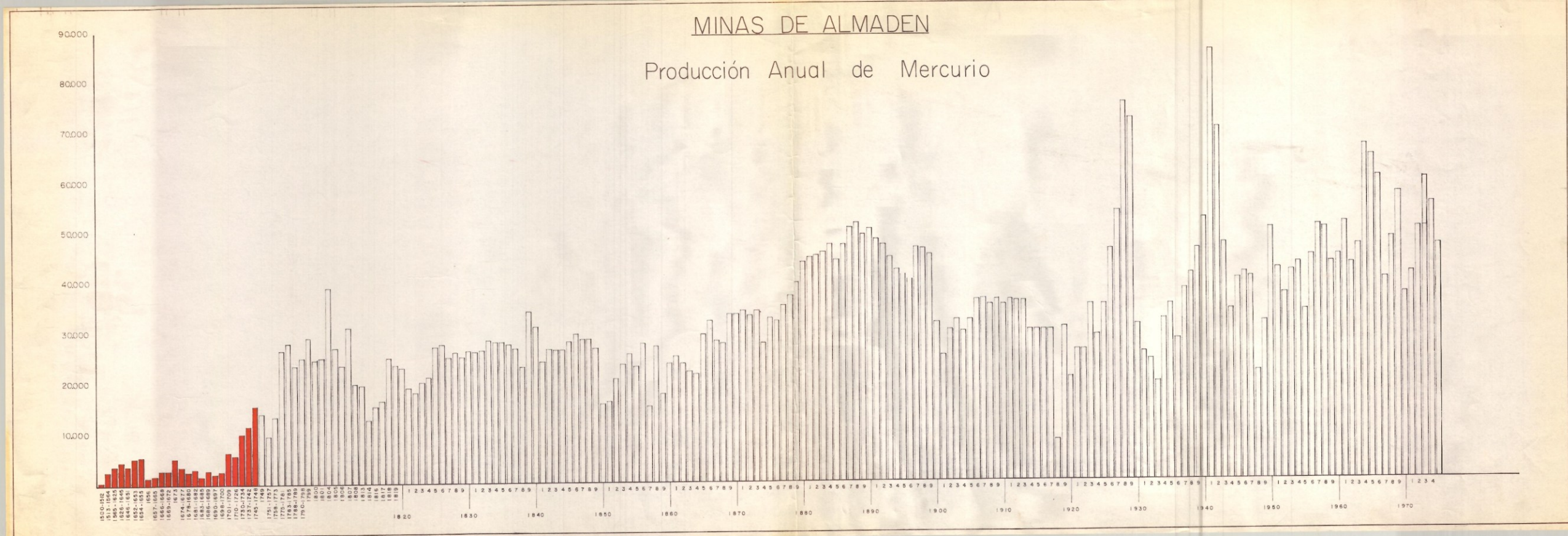
Fig. 1
The distribution of mercury mineral belts with significant mercury production (in red) occur in a relatively few areas of the globe. Three-fourths of the global mercury production has come from five mercury mineral belts (listed in decreasing mercury production): Almadén, Idrija, Amiata (1), Huancavelica (2), and the California Coast Range (3), which contains the New Almadén and New Idria deposits. Modified from Bailey and others (1973)

Almadén – The Mine

- Located in south central Spain, in the province of Ciudad Real, Castilla-La Mancha region
- From the geological point of view, hosted in the Iberian Massif, Central Iberian Zone

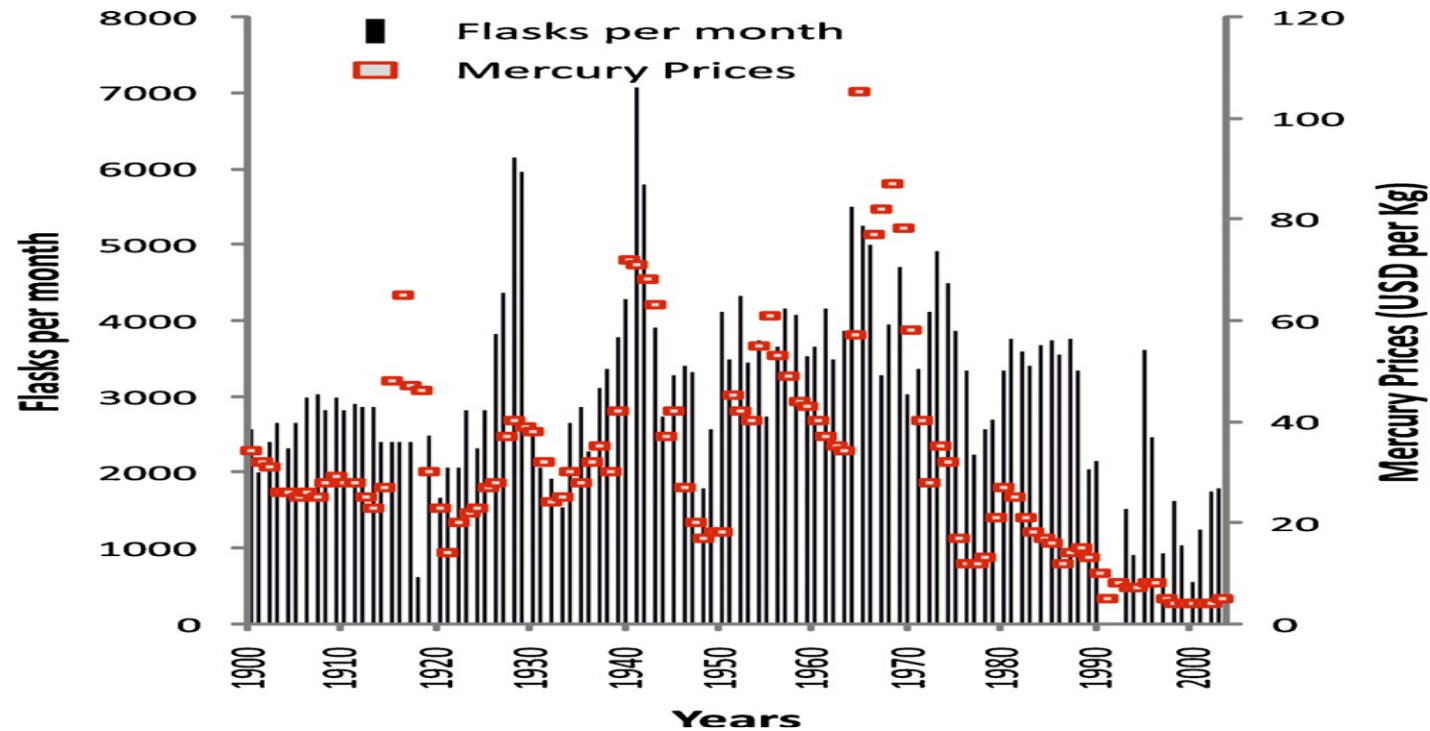


Almadén – The Mine



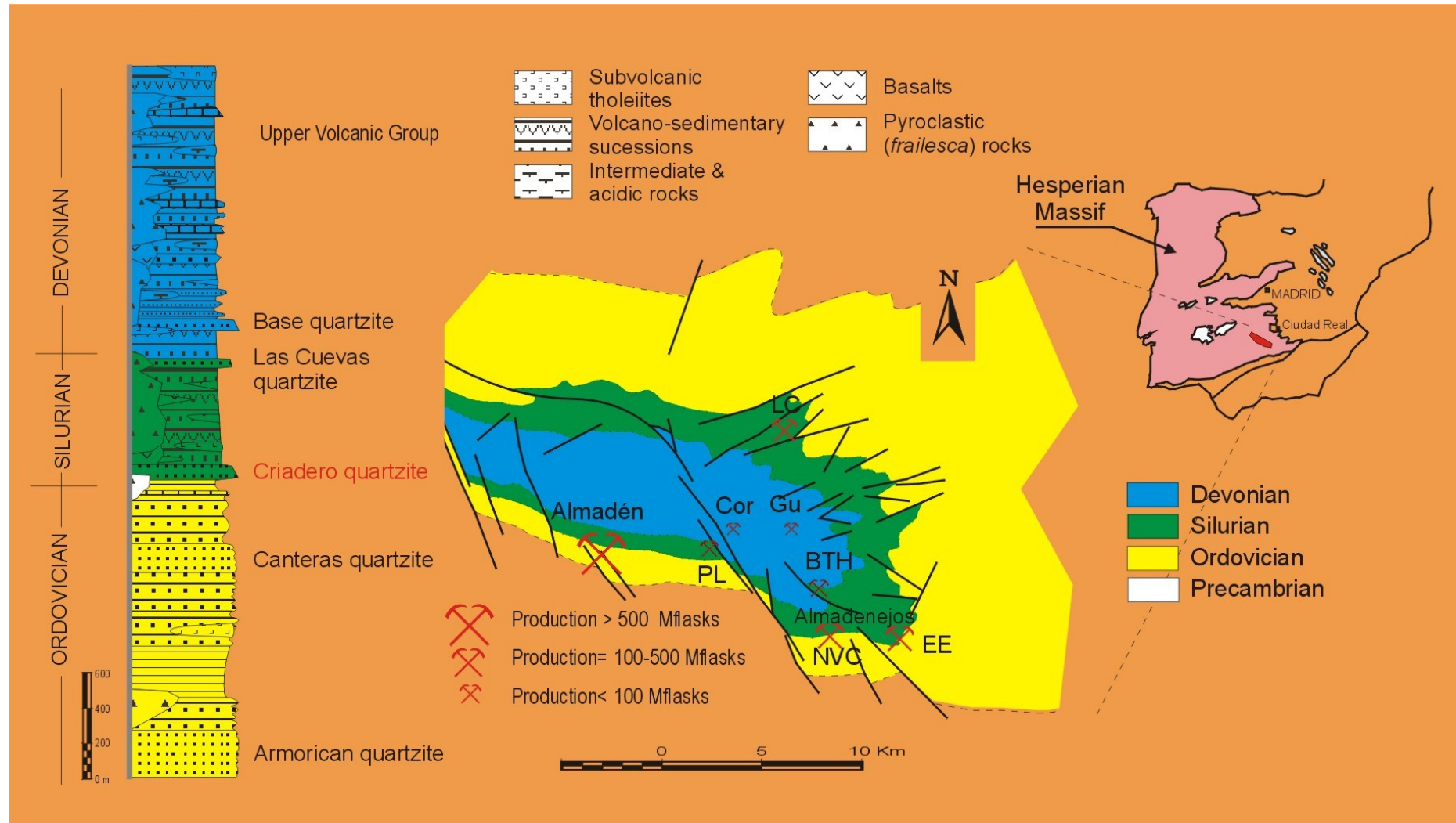
Evolution of Hg production since year 1500 to 1975. Data from local historical museum.

Almadén – The Mine



Evolution of production and mercury prices during the twentieth century. Production data are from local historical museum. Prices are from Swain et al. (2007)

Almadén – The Mine – The Almadén syncline



The Almadén mercury mining district

- Mercury mineralizations / mines: two major types
 - **Almadén type:** Stratabound mineralizations, hosted in “Criadero Quartzite”
 - **Las Cuevas type:** Epigenetic mineralizations, of different typology in the detail:
 - Vein guided replacements in magmatic rocks (Las Cuevas)
 - Veins in quartzite rocks (Pilar de la Legua)

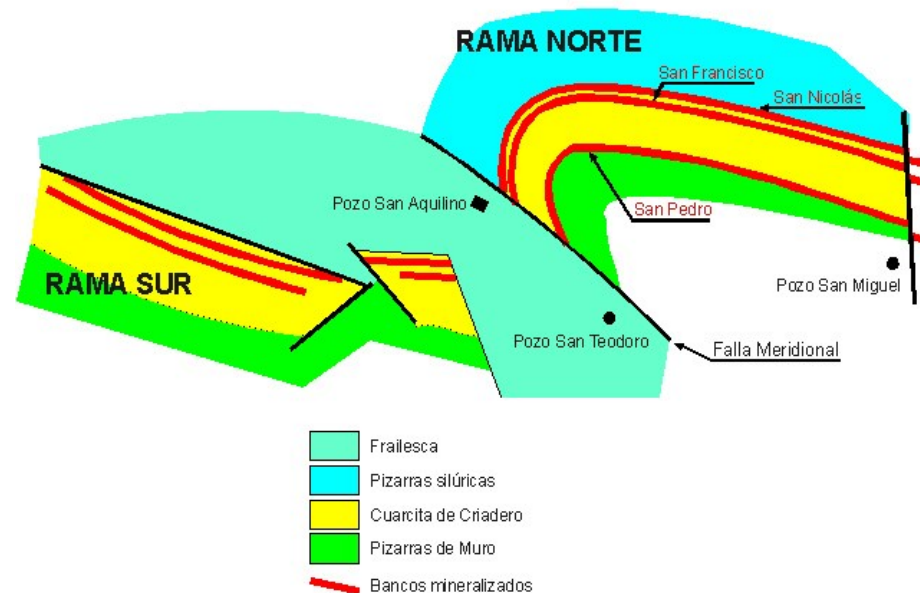
The Almadén Mine

- Active since more than 2.000 years
- Non-stop historic activity

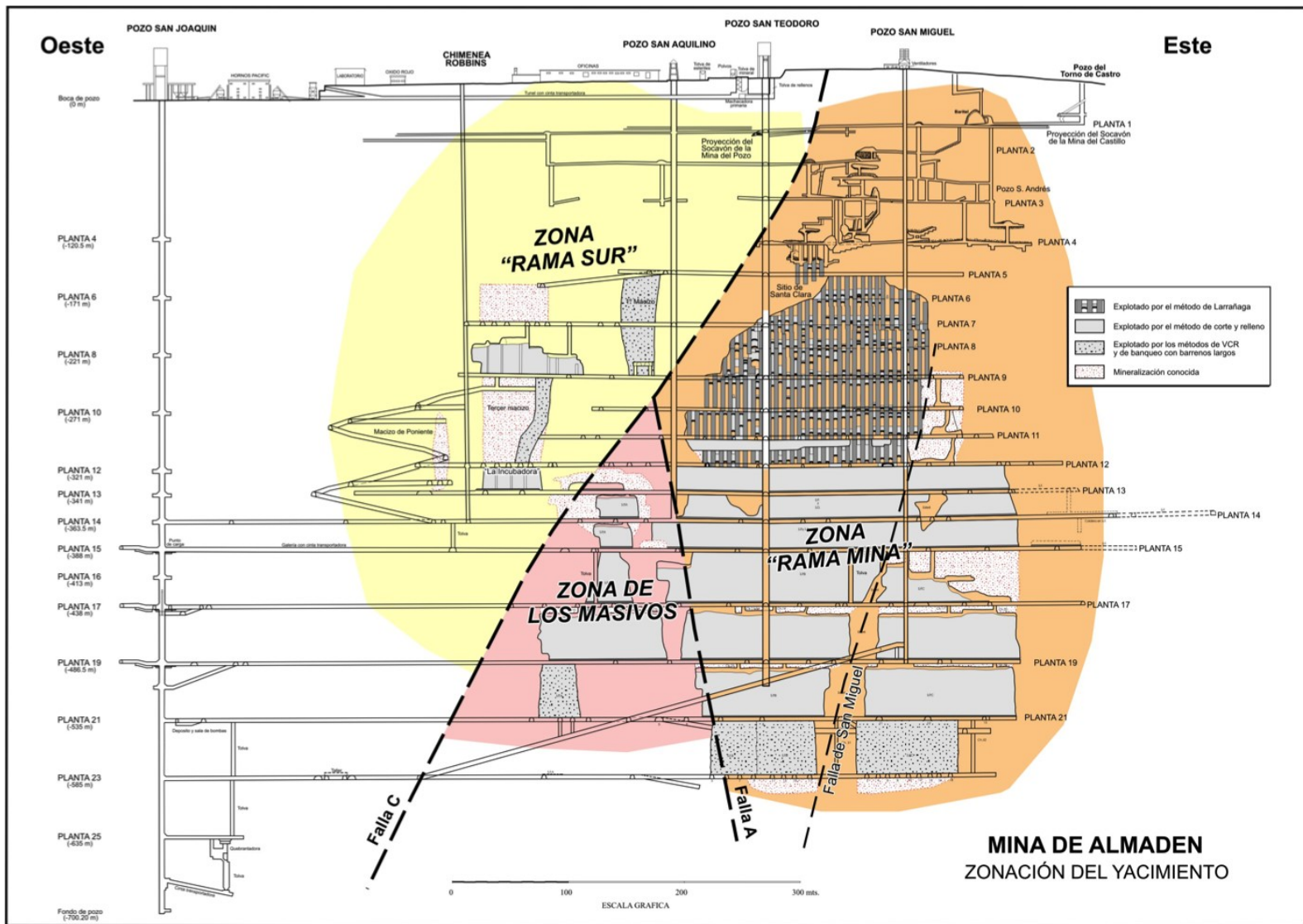


The Almadén Mine

- Two branches (ramas):
 - Rama Sur: the first in activity, closed from 18 Century to the 80s, active again until May 2002
 - Rama Norte: discovered in 1700, in activity until 1992



The Almadén Mine



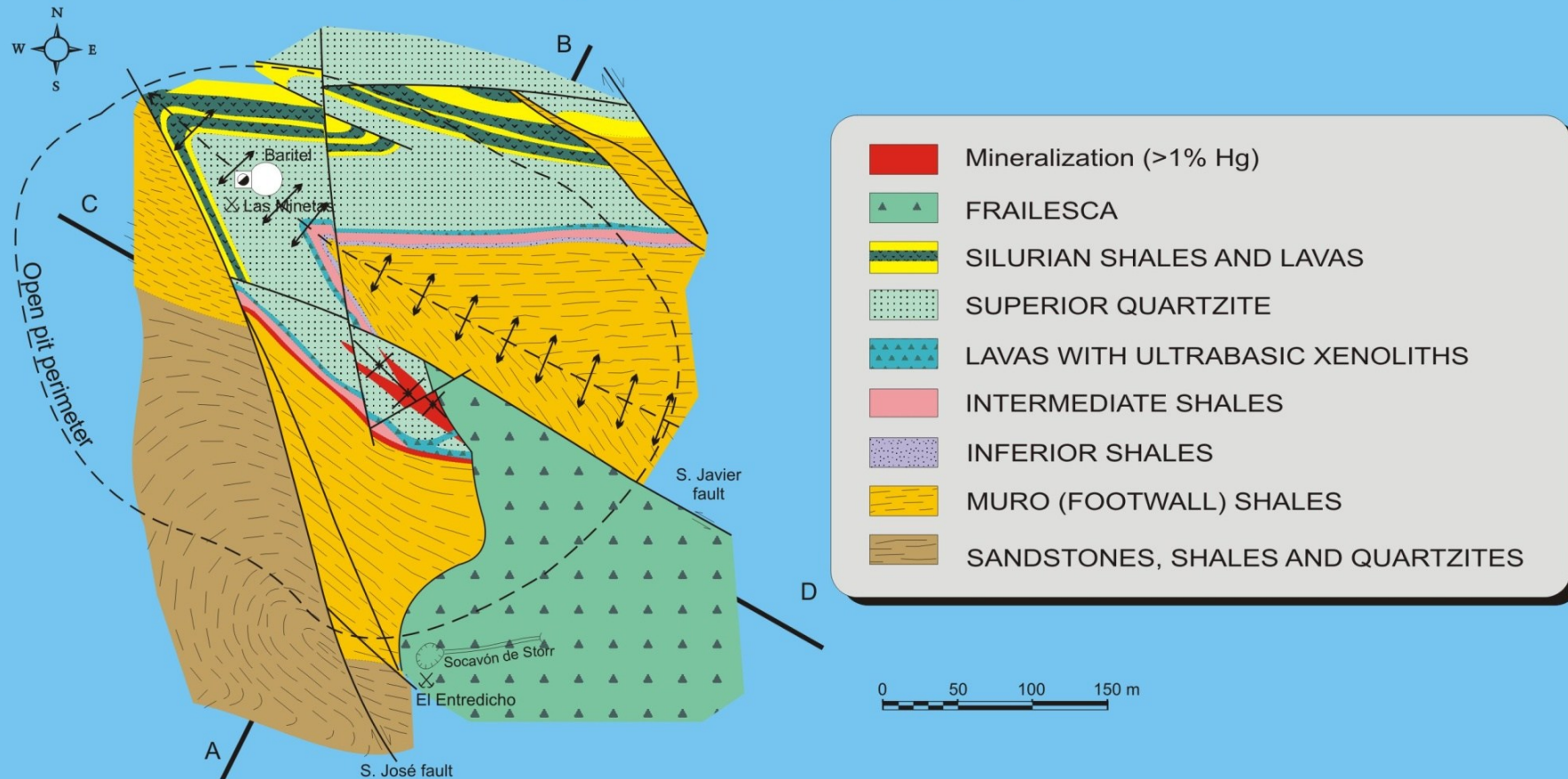
El Entredicho Mine (open pit)

- Discovered in 1982
- Works begun 1986
- Closure: Sept. 1997
- 250 m. diameter by 150 m. high
- Mine ratio: 10:1
- Originals reserves: 350.000 flasks

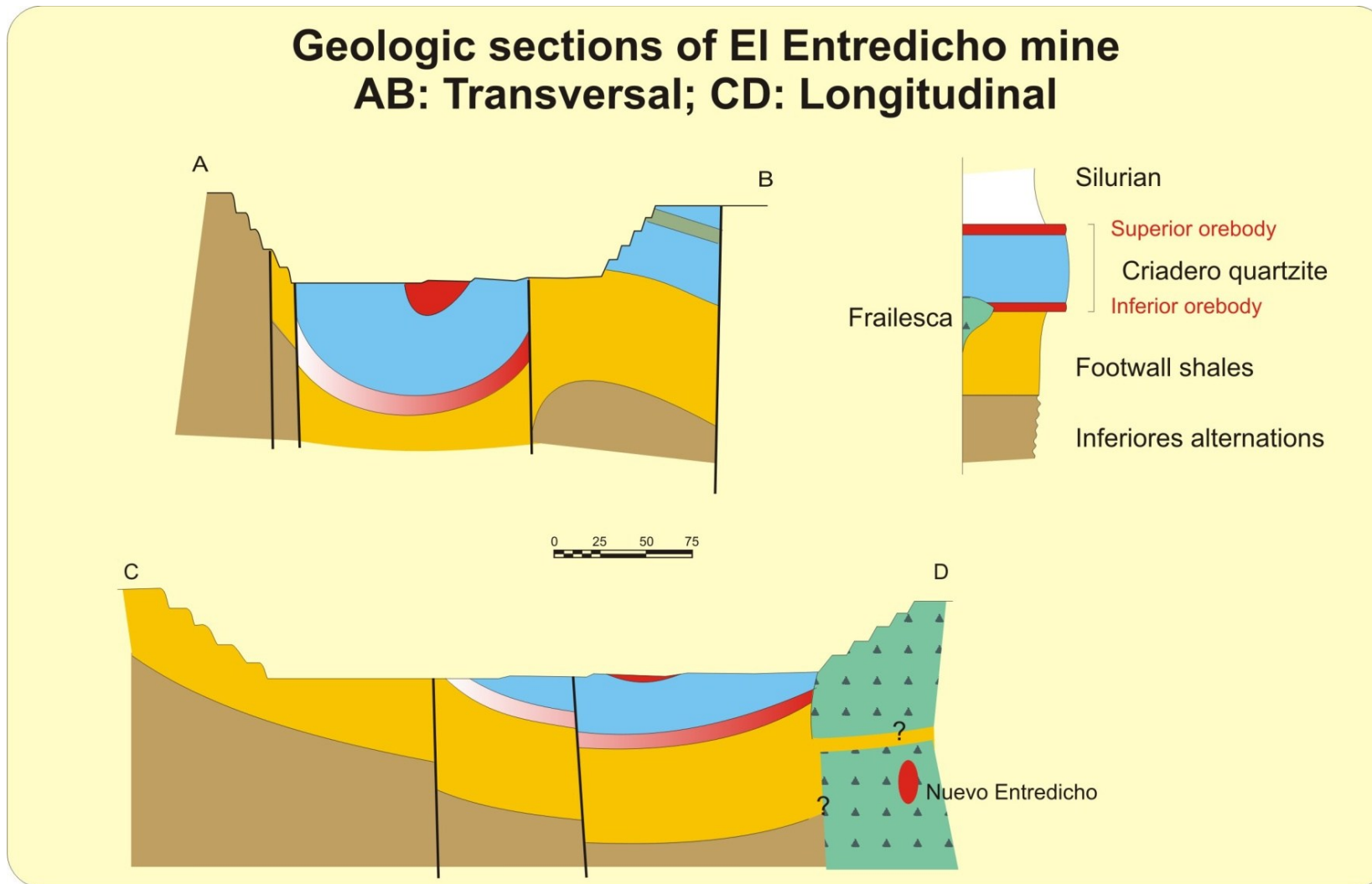


El Entredicho Mine (open pit)

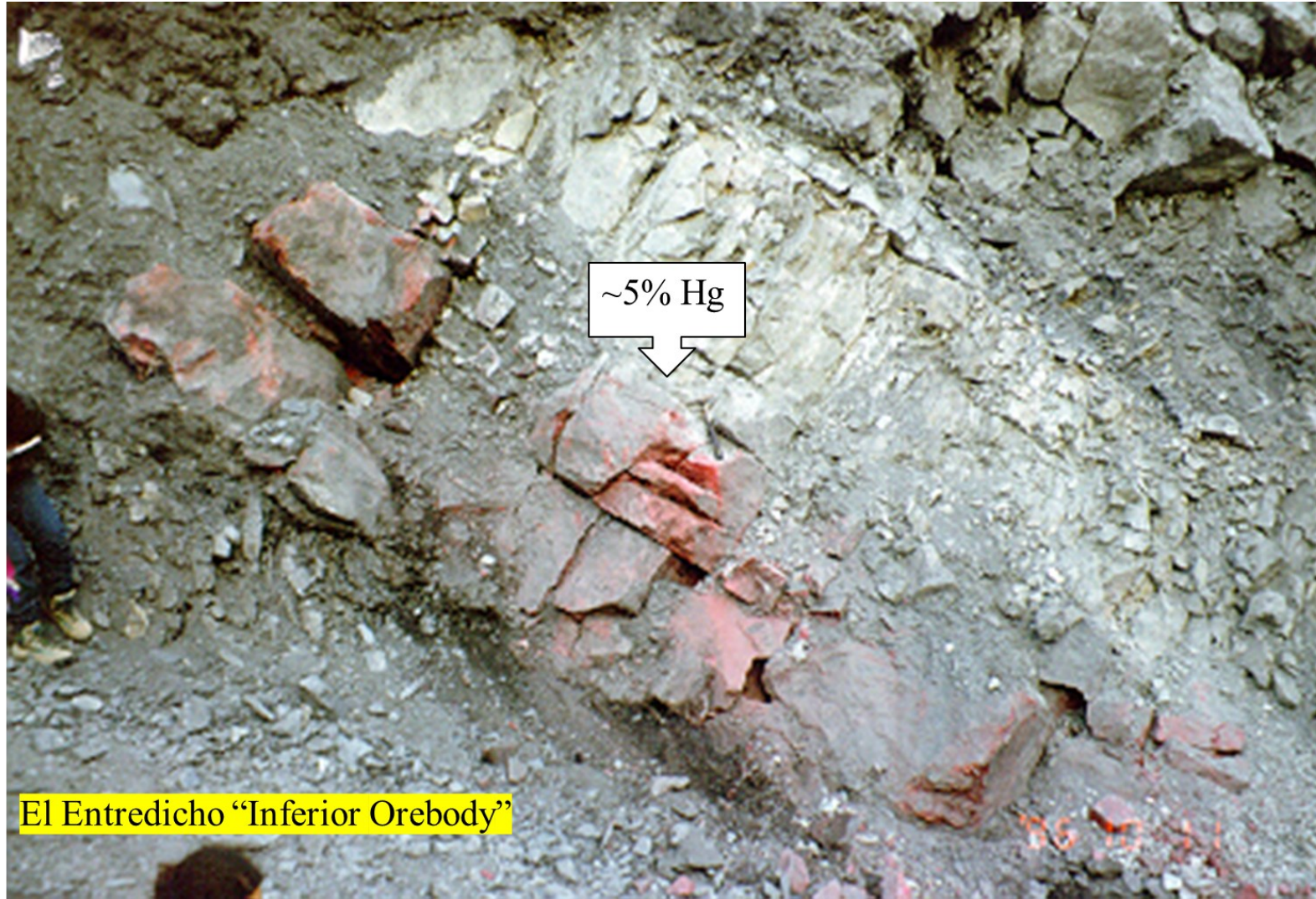
Geologic scheme of El Entredicho mine
(after Hernández, 1983)



El Entredicho Mine (open pit)



El Entredicho Mine (open pit)

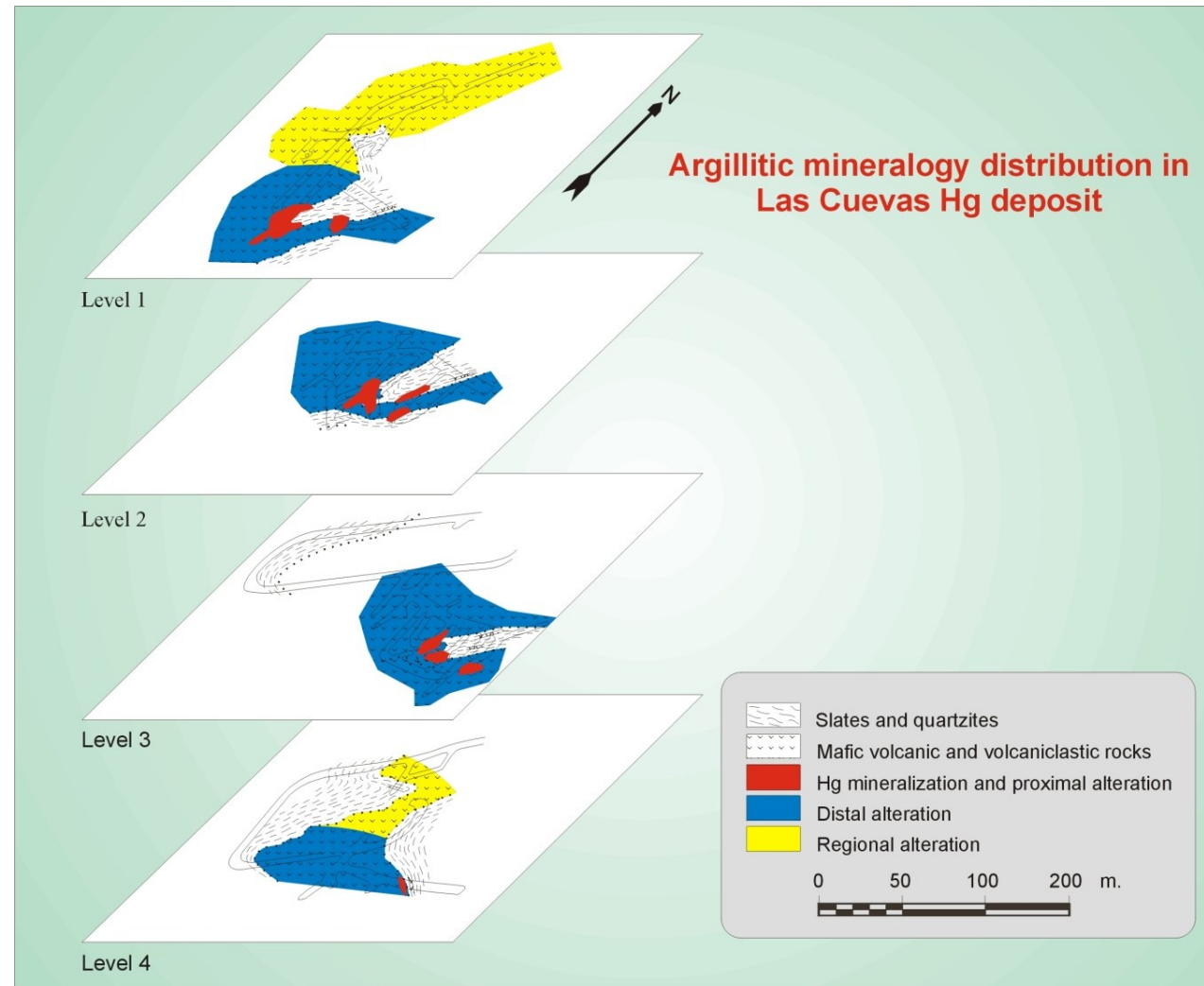


El Entredicho "Inferior Orebody"

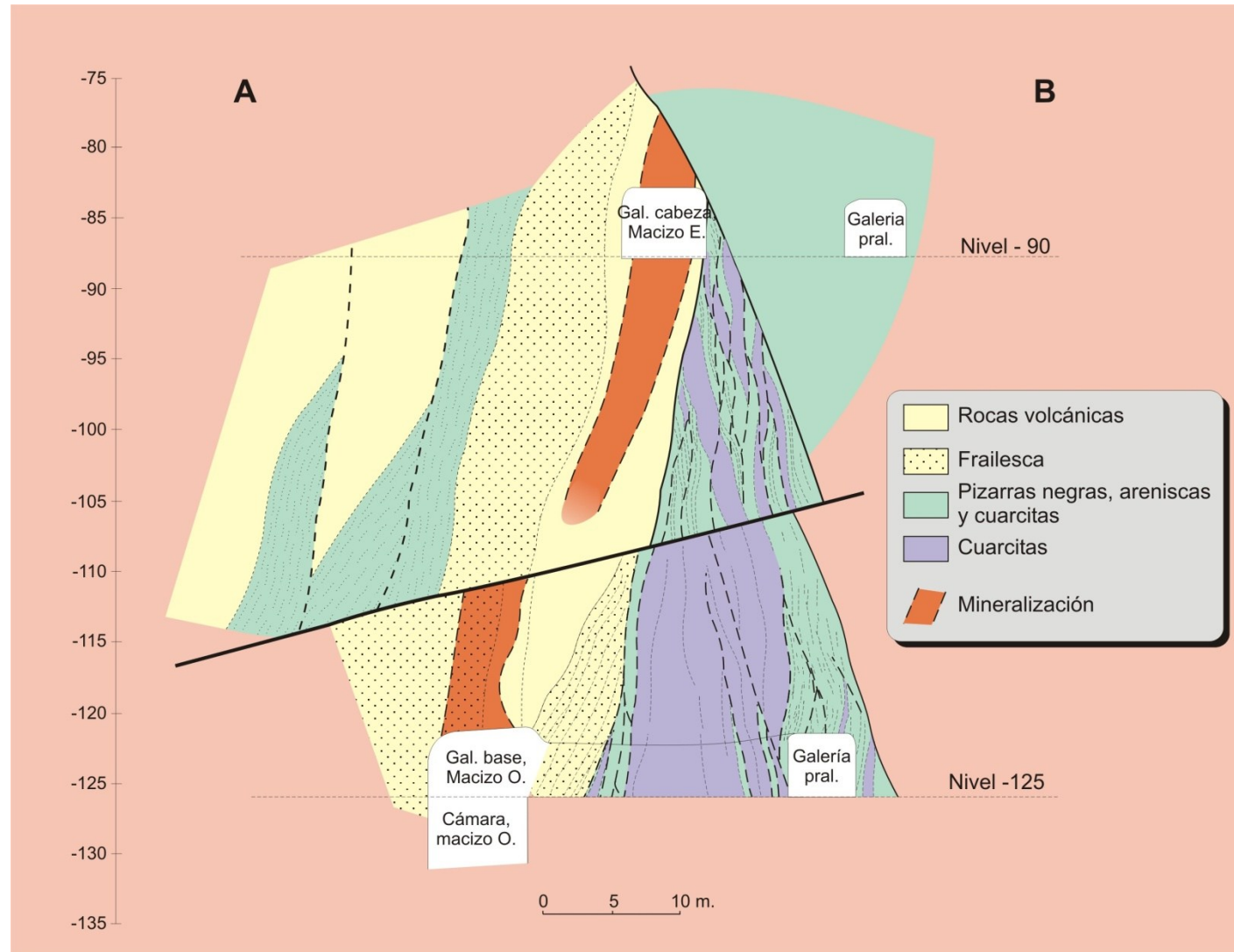
Epigenetic mineralizations – Las Cuevas mine

- Cinnabar in veins and semi massive replacements
- Cross-cutting the “*frailesca*” rock
- Relationship with a local argillitic alteration
- Pyrite much more common than in stratiform deposits
- Minor size

Epigenetic mineralizations – Las Cuevas mine



Epigenetic mineralizations – Las Cuevas mine



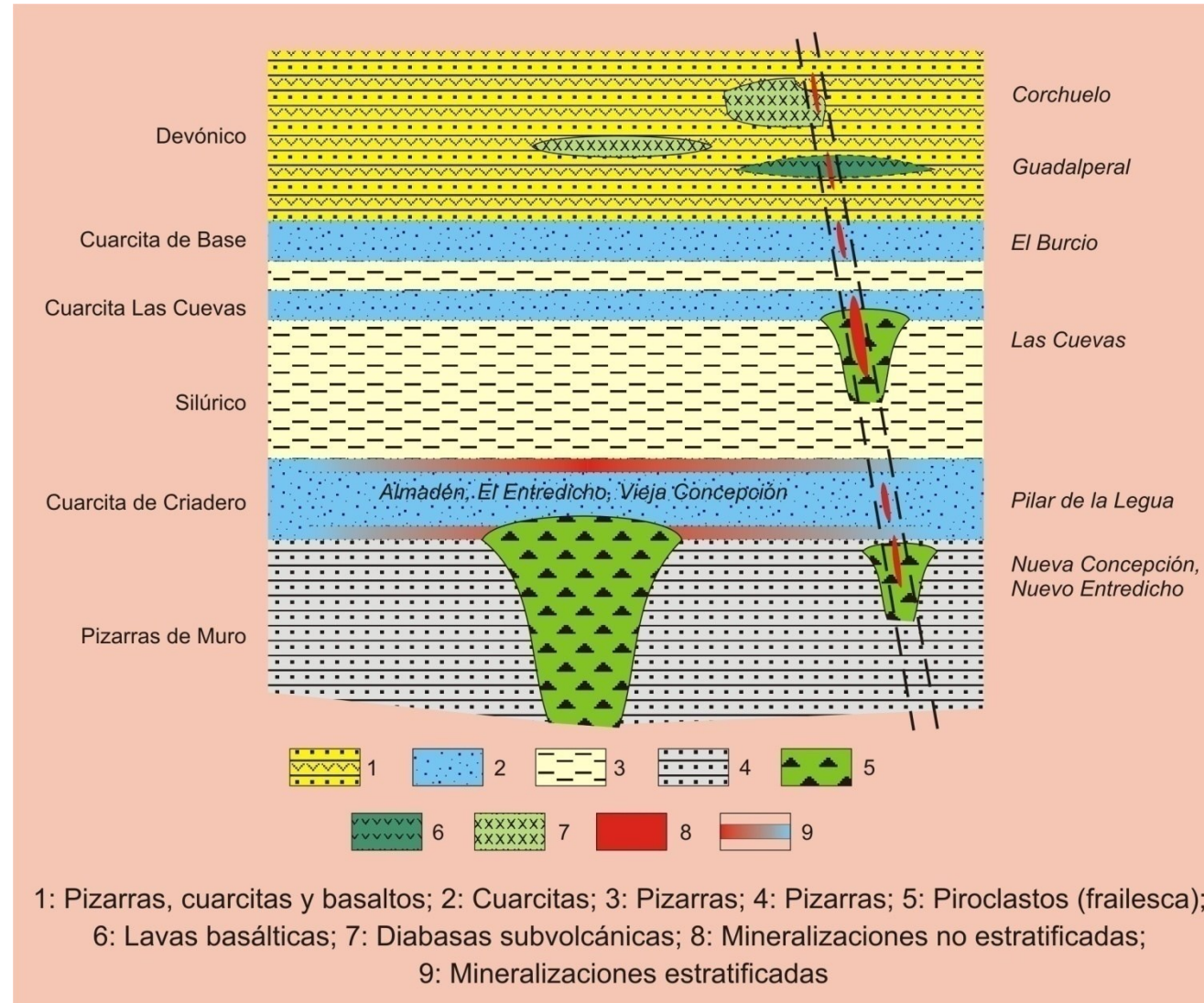
Epigenetic mineralizations – Las Cuevas mine



Epigenetic mineralizations – Las Cuevas mine



Typology and origin of mineralizations



Possible geotectonic setting

