

CHERRY HILL - (HOT SPRING GOLD DEPOSIT)

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Chibako - Geological Model.

c.f. Sulphur Creek District, California.
- Cherry Hill deposit (Homestake).

Hg. association (economic in that area).

Features: - Recent sinter deposits in large areas of silicification and argillic alteration.

- Host rocks strongly enriched in Au, Ag, Hg, Sb, Tl, As.

- Thrust faulting important in Cherry Hill camp.

- mineralized systems developed on older strike slip faults related to San Andreas (30my).

- Structures have controlled magma emplacement in Tertiary. (2.2my Clearlake volcanics) → Heat Source.

- Steeply dipping faults. Hot springs close to intersection of regional sets

Mineralization and alteration: -

- Stockworks of dz veinlets. Individual veins up to 10cm

- Breccia zones at fault intersections

- Early adularia veins associated with pervasive sil - not mineralized - 1928
crustiform textures & comb structures.

- Cold deposition associated with silicification & dolomite alteration

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Geochemical signature:-

(Normalized data = Value / value from fresh sample).

- Rock samples - show wide haloes for Hg, Sb
moderate Tl + As.

- restricted Au + Ag.

• Hg, As, Sb clearly outline structures.

Strong spatial association of Au + argillite alteration.

Summary:-

- early adularia - Q_3 event sealed host rocks \rightarrow
ground preparation.

Note: adularia not spatially related to Au!

Au closely related to argillite alt + Hg, As, Tl anomalies.

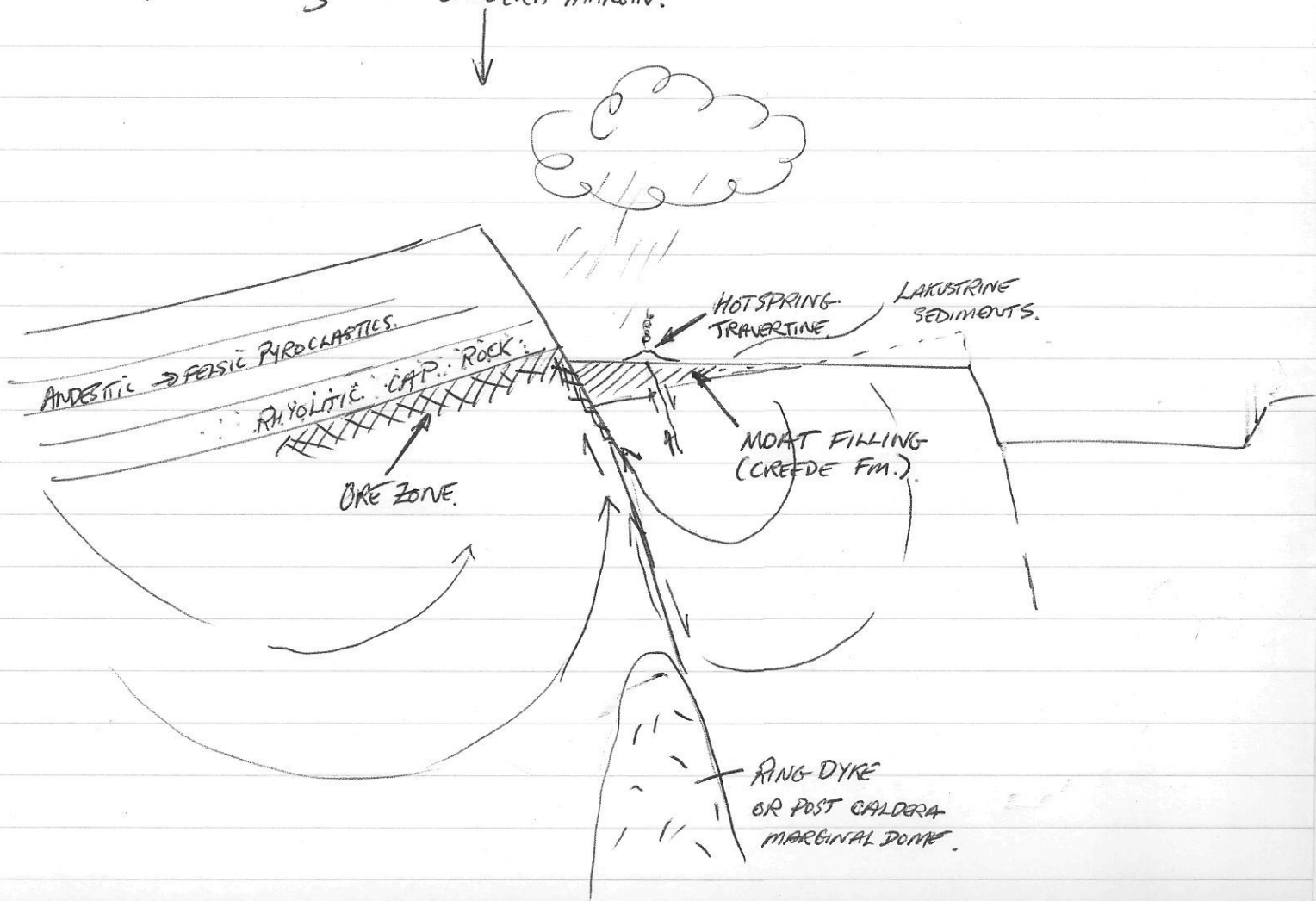
Santiago del Norte: - (Philippines).

Vertical extent of veining ~ 230m. - 270m.
Argillite alteration generally above productive veins.

Hydrothermal conduits appear to be controlled by anticlinal
structures in basement rocks.

Similarities of Creede caldera to Clisbako Caldera

- marginal domes with late flows.
- Resurgent doming formed graben structure across caldera.
 - steep dipping faults are locus of epithermal activity
- Low lying structural moat at rim of caldera was site of late flow & talus deposition. Also marginal lakes with mineral springs \rightarrow travertine \rightarrow Creede Fm.
- Travertine deposits in marginal basin
- Younger (post dome) faults cut Creede Fm. These are mineralized. CALDERA MARGIN.

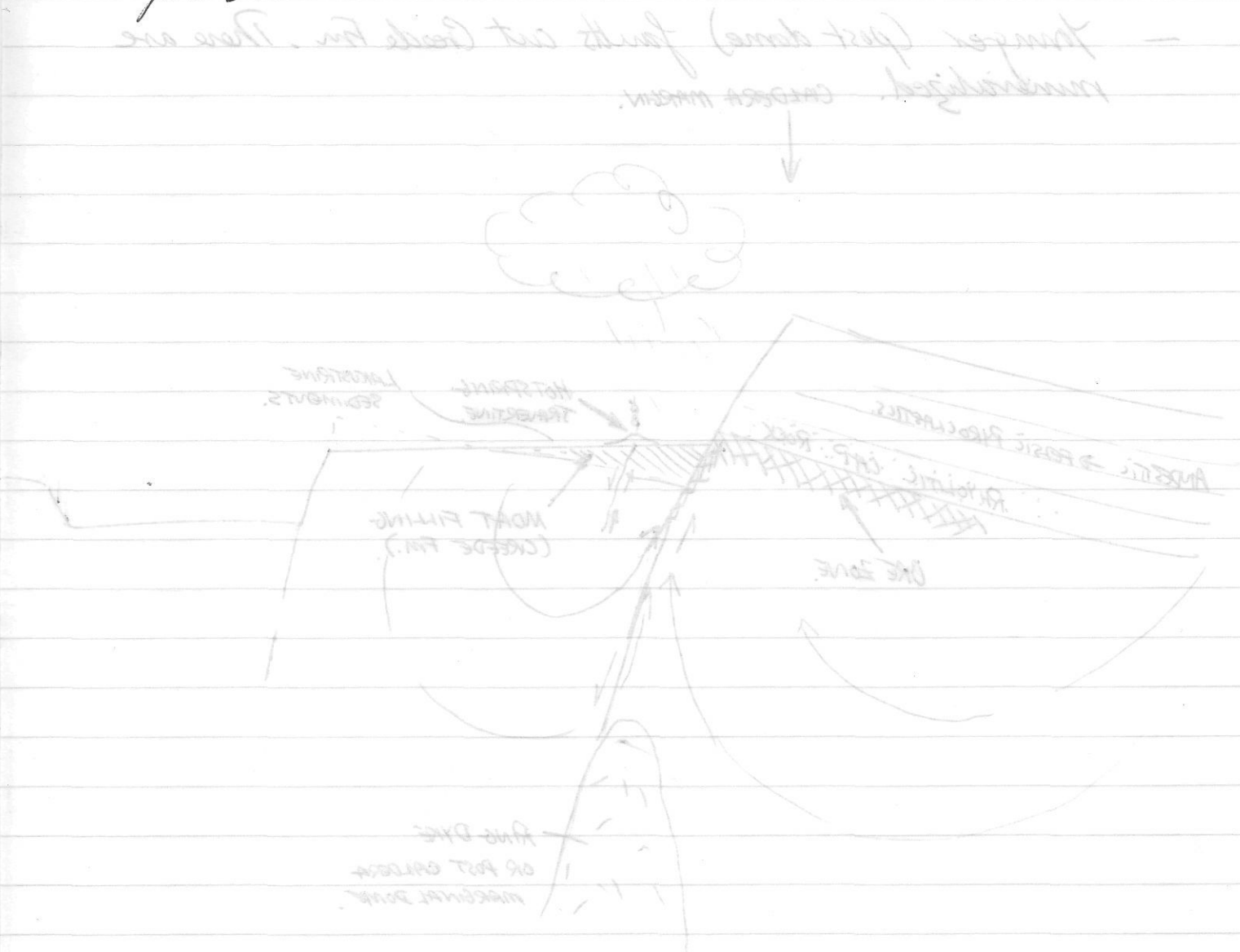


Ore deposited where late fractures cut massive rhyolite unit \Rightarrow cap rock

Ore interpreted to occur ~ 150m below palaeosurface of moat facies.

Deposition at ground water table (or below) - highest in saturated moat facies.

Resurgence caused by emplacement of a late shallow pluton.



SLEEPER

Discovered as a result of prospecting uranium stannate zone.

- delineated a large untested epithermal zone.

- First drillhole intersected 70m of 1.1g/t Au, 23g/t Ag.

Alteration:

- complex zone of brecciation. 100m long x 400m at intersection of two faults. (AGAIN).

- grade into shattered wall rocks.

- pinch out 100m below surface.

- Breccias intensely silicified - form lenticular zones 30m x 100m. which parallel major faults.

- Argillic envelope 2500m x 1500m. - Silicification much more restricted - proximal to structures.

Silicification - complete replacement close to major fault zones. Perovskite zones follow stratigraphy. Veins include banded chalcedony and opal.

Primary rock textures are destroyed by Kaolinite, Montmorillonite & illite assemblage. Alt forms a blanket over the deposit & extends 500m from ore.

Geochemistry:-

Outcrop samples reveal a large geochem anomaly.

- rock samples average 200ppb Au, 200ppm As, 100ppm Sb

Arsenic gives a uniform anomaly around the deposit.

Gold mineralization:

- Concentrated in silicified rocks.
- Values $> 1\text{g/t}$ are closely associated with breccia zones.
- Visible electrum and gold occur in banded veins cutting breccia bodies.
- Largest Bonanza shoot measures $25\text{m} \times 4\text{m} \times 50\text{m}$. ($> 1000\text{g/t}$).

- Average surface values: - 250 ppb. (20 - 630)

Ag 27 (1.2 - 59)

As 340 (10 - 920)

Sb 130 (19 - 185)

Ba 1100 (48 - 2200)

Cu 360 (5 - 6800)

Pb 7 (2 - 13)

Zn 25 (4 - 260).

Conclusion: - deposit formed in a hot spring reservoir of a geothermal system.

- Range front fault + breccia zones provide permeable horizons
- Occurs at intersection of two major faults.
- Bonanza shoots are late and localized along N trending faults.

Hishikiri:-

Q₃ - adularia system.

An + Ag shows a positive correlation with Al₂O₃ + K₂O.

Association of An with adularia - unlike. Surogo.
of Sleeper. - ~~attracted~~.

Gravity survey important in discovery. Small highs occur over most gold deposits in district.

Over deposit NE trending gravity (4mgal) - also Resistivity low from airborne data.

First drill intercept at 291m. 15cm Q₃ vein averaging 290.3g/t Au + 167g/t Ag. In basement shales.

A zone of Q₃ veins 700m long and 100m deep was defined by subsequent drilling.

System lies at edge of Caldera structure, which lies on a major graben (Intersection of faults again).

Veins coincide with topographic highs in paleo surface.

Discrete ore veins (not stockwork zones) 1-3m in width. Containing bonanza zones at depths of 150-200m depths.

Veins are crustiform banded and symmetric. Evidence of repeated collapse → vugs and breccia veins.

Ag / Ar ratio > 1 in upper levels \rightarrow 0.5 deeper down.
i.e overall decrease in Ag with depth.

Soil gas surveys are effective:- Hg, Rn, CO₂
Other fracture systems are identified.

Geophysics:-

Gravity - Highs reflect areas of elevated basement.
Local doming - veins occur where basement rises to 100m

Resistivity - Hydrothermally altered zones have resistivities of $\sim 20 \text{ ohm-m}$. Background for anderites in area is $\sim 250 \text{ ohm-m}$.

Near surface alteration zones - defined by $< 25 \text{ ohm-m}$

IP surveys may well define pyritic zones.

At Mishikani - apparent resistivity clearly defines the halo ($< 25 \text{ ohm-m}$)

Chargeability high (in MV/V.)

General:-

Bladed Q₃ + Adulana \rightarrow Boiling system