Geologic Overview of the Yanacocha Mining District
Cajamarca, Northern Peru

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Outline

• Introduction
• Regional Geology
• District Geology
• Deposit examples
Location and Ownership

- Newmont: 51.35%
- Buenaventura: 43.65%
- IFC: 5%

Map showing the location of Yanacocha and Lima in South America.
Reserves

Reserve Million oz

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Million oz | 4.0 | 4.9 | 6.1 | 13.9 | 20.6 | 32.9 | 36.6 | 34.2 | 32.6 | 31.7 | 32.2 | 32.6 | 29.3 | 27.6 | 24.8 | 22.3

Gold price ($) | 400 | 400 | 400 | 400 | 350 | 325 | 300 | 300 | 300 | 325 | 375 | 400 | 500 | 575 | 725 | 800
History

- **Pre-Inca mining (mercury)**
- **1968**  
  Nippon Mining - 13 holes (Cu)
- **1969 - 1971**  
  BGS regional stream sediment survey
- **1981**  
  Cedimin (BRGM) follow-up of BGS Pb and Ag anomalies
- **1983**  
  Newmont visited the area for first time
- **1984**  
  Joint Venture signed with Cedimin / Buenaventura
- **1985**  
  Drilling - low grade Ag resource + narrow Au
- **1986 - 1995**  
  Discovery of Yanacocha Sur + Norte, Carachugo, Maqui Maqui, San José, Encajon, Cerro Quilish and Cerro Negro.
- **1993**  
  Carachugo production
- **1996 - 1998**  
  Discovery of La Quinua, El Tapado and Chaquicocha Sur Deposits
- **1999 - 2000**  
  Discovery of Corimayo (blind oxide) Deposit
- **2000**  
  Begin Exploration of District-Scale Au-Cu Sulfide Potential
- **2001-2003**  
  New models of Exploration, discovery of Chaquicocha Alta, and Antonio.
- **2004**  
  Discovery of Cerro Negro Deep Oxide and Giuliana Deposits
- **2005**  
  Focus in Chaquicocha high grade sulfide
- **2006**  
  Focus in Yanacocha verde, Au-Cu sulfide mineralization.
- **2008 - 2009**  
  Discovery of Crater (Cu-Au mineralization), re-assessment gravel deposits.
Regional Geology

Compilation
Geology

Quaternary
Intrusive
Volcanic
Sedimentary
Metamorphic

Au-Cu Porphyry deposits
Au HS deposits
Base metal deposits

La Zanja
Cerro Corona
Tantahuatay
Yanacocha District
Sipan
Galeno
Conga
Michiquillay
District Geology - Alteration

Legend
- Opaline
- Granular Silica
- Vuggy Silica
- Massive Silica
- Alunite Quartz
- Silica Clay
- Clay
- Propylitic
- Fresh Rock
- Marble
- Sericite/Illite-Pyrite
- Skarn

Locations:
- Cerro Quilish
- La Quinua Complex
- Yanacocha
- Chaquicocha
- Maqui Maqui
District Geology
Au Contours Surface Geochemistry - Structures

GEOCHEM Au
- < 0.100
- 0.100 - 0.350
- 0.035 - 1.000
- 1.000 - 2.500
- 2.500 - 5.00
- > 5.00

+90,000 samples
Deposit Examples

Exploration Concepts

• Favorable pyroclastic unit.
• Multi-events of breccia and intrusions.
• Structural Traps Beneath and Marginal to: Flow Dome Complexes; Diatremes; Late-stage, High-level Intrusives.
• Mineralization beneath fresh Andesite Cap Unit.
• Potential Au-Cu sulfide mineralization below oxides.
• Examples:
  Corimayo
  Antonio
  Cerro Yanacocha
Deposit Examples

Corimayo Deposit – Schematic Section 25250

Deposit Examples

Corimayo Deposit – Schematic Section 25250
Deposit Examples
Antonio Deposit

Andesitic dome

Fresh upper andesite unit

Discovery outcrop, massive and vuggy silica with barite
Deposit Examples
Antonio Deposit - Section 30500N

EXPLANATION
- Coberture
- Dome
- Dike
- Upper Andesite
- Maqui Maqui Ignimbrite
- Lower Andesite
- Faults

Au (g/t)
- 0.20 - 2.00
- >2.00

Deposit Examples
Antonio Deposit - Section 30500N

ANT-009
ANT-029
ANT-033
ANT-047
ANT-058
ANT-069
ANT-071
ANT-073
ANT-074
ANT-075
ANT-077
ANT-078
ANT-080

EXPLANATION
- BARITINA FAULT
- YA FUISTE FAULT
- AGUILA FAULT
- SULFIDE GOLD SHAPE >2g/t

Single Hole Details
ANT-071
20m / 2.97 g/t Au / 94-114m Sf
20m / 12.66 g/t Au / 122-142 m Sf

ANT-069
51.3m / 7.53 g/t Au / 26m to 77.3m Sf
Deposit Examples

Cerro Yanacocha Deposit
Deposit Examples
Cerro Yanacocha Deposit - Lithology

Geology Bench 3802

Legend
- Cover
- Dacite Porphyry
- Dacitic Breccia
- Andesite
- Hydrothermal Breccia
- Phreatic Breccia
- Diatreme
- Lithic Tuff
- Crystal Tuff
- Ultimate Pit
Legend
- Hydrothermal Breccia
- Phreatic Breccia
- Diatreme
- Dacitic Breccia
- Dacite Porphyry
- Lower Andesite
- Lithic Tuff
- Crystal Tuff
- Andesite
- Faults
- Ultimate Pit
- Cu Shape >0.3%

Deposit Examples
Cerro Yanacocha Deposit
Deposit Examples
Cerro Yanacocha Deposit - Alteration

Legend
Granular Silica
Vuggy Silica
Massive Silica
Alunite Quartz
Clay
Propylitic
Fresh Rock
Ultimate Pit
Deposit Examples
Cerro Yanacocha Deposit – Alteration Schematic Section

Legend
- Massive Silica
- Alunite Quartz
- Argillic
- Diaspore
- Pyrophyllite
- Ultimate Pit

Cu Shape >0.3%

Deposit Examples
Cerro Yanacocha Deposit – Alteration Schematic Section

Legend
- Massive Silica
- Alunite Quartz
- Argillic
- Diaspore
- Pyrophyllite
- Ultimate Pit

Cu Shape >0.3%
Deposit Examples
Cerro Yanacocha Deposit – Cu Mineralization

Legend
- Green: Shape Cu 0.3%
- Orange: Shape Cu 0.5%
- Purple: Shape Cu 1.0%
- Black: Ultimate Pit

Deposit Examples
Cerro Yanacocha Deposit – Cu Mineralization
• At Regional scale, the Yanacocha District located in the intersection of NE structural corridor and the NW Andean trend.

• At District scale: 1) the presence of favorable permeable rocks (Yanacocha pyroclastic rocks) that favor the fluid flow and mineralization, 2) the multiple events of breccias and high level intrusions, and 3) the structural setting, were key to the formation of multiple high sulfidation centers with several overprinted events of mineralization.

• At deposit scale, feeders conduct the fluids along the favorable horizons (Antonio), the border of dome and diatremes serves as traps for high grade mineralization (Corimayo), multiple breccia events and intrusion favor a long-lived system where cohesive Cu-Au mineralization in sulfides occur below the oxides (Cerro Yanacocha).