The Balboa Discovery, Cobre Panama

PDAC - Toronto  5 March 2014

Colin Burge
**Location**

**Cobre Panama**

**Access:**
4hrs by road from Panama City
Geology - Panama

Porphyries become older as you move to the east

- Cerro Colorado: 3 - 5 Ma
- Cobre Panama: 30 Ma
- Rio Pito: 48 Ma
Project Description

2.1Bt @ 0.41% Copper *

**MINE:**
5 large open pits
Strip ratio average 0.7:1

**MILL:**
70Mtpa increasing to 100Mtpa Yr10
Conventional flotation

**PORT** Facility and
300MW Coal-fired power plant

* NI 43-101 Proven and Probable Reserve, May 2010
Regional Geology

Large Oligocene batholith
Andesite volcanics
Porphyries on margin are associated with ore
Batholith younging south
Fossil dates 40-34Ma
Shallow marine setting

U-Pb dates courtesy Codes/Amira
Fossil study – Smithsonian Tropical Institute.
Factors affecting Exploration

- Thick jungle cover
- Saprolite clays average 20 meters
- Climate 4 meter rainfall/yr
- Poor access
- Steep incised terrain

Saprolite oxidized Range 0-50 meters
Residual soil
Sap rock
Fresh rock

Photo courtesy Henry Awmaek
Exploration History - Cristobal Colon 1503

Reports of gold and a strait to another ocean
Columbus lands at Rio Belen
Four phases of Exploration activity

Copper Price/lb


Program

UN  JP  CDN JV  MPSA
AZUERO PENINSULA SURVEY

Evaluated 17,000 km²
Stream sediment discovery
26,000 samples collected in survey

Drilling leads to discovery of Botija East and significant mineralization at Colina and Vega

Jussi Huhta Finnish geologist and UN Project Manager at Botija discovery outcrop

Bell 47 slinging supplies at Botija
Stream Sed anomalies led to discovery

Silts- Cu ppm
- >500
- 300-500
- 100-300
- <100
Adrian/Inmet/Teck 1990-1997

Soil sampling and Magnetics
Drilling 563 holes - 111,000m

discovery of Botija west starter pit and Valle Grande
identify significant mineral at Brazo - BotijaAbajo

A few holes in Cuatra Crestas prospect
Soil Anomalies

Copper

Soil - Cu ppm
- 400-1,000
- 200-400
- 100-200
- <100

Molybdenum

Soil – Mo ppm
- >50
- 20-50
- <20
**MPSA FEED Study  2007-2010**

- 390 holes  92,000 meters HQ drilling
- Botija, Colina, Valle Grande drilled to reserve status
- extensive Metallurgy and Comminution testing
- Brazo and Botija Abajo established as resources
Balboa Discovery
Exploration Targets 2010

Cuatro Crestas

0.70%/57m

0.23%/227m

0.91%/104m

0.16%/180m

0.54%/125m

0.62%/311m
MPSA Exploration Program

- **Objective:** to locate higher than average Cobre Panama grades
- **Exploration drilling** began in Brazo area with widely spaced deep holes looking for enrichment blanket
- **Decision taken** to fly EM in order to cover difficult terrain rapidly

Sillitoe, R.H. 2010, Porphyry Copper Systems, Economic Geology V105
ZTEM Survey

- Geotech Ltd mobed to site late August 2010
- Concession covered on 300m line spacings with Magnetics and ZTEM
- ZTEM is a passive EM technique utilizes Earth’s natural Electric field as a transmitter (generated by distant lightning strikes)
- Frequencies are read in the audio range from 28 to 2800 Hz
ZTEM Results

System appears to be mapping near surface sulphides
Large untested anomaly northwest of Cuatra Crestas prospect
Deep response also present at known deep sulphides at Botija
Reduced to Pole Magnetics

1995 and 2010 surveys show similar patterns - Andesite highs
Known deposits represented by demagnetized areas - phyllic?
Balboa is a positive magnetic anomaly
4 holes on 400m step-outs were proposed

Hole #1 intersected 0.28% Cu / 209m and 60m below 2.9% Cu / 2.0g/t Au / 6.4m in sheeted quartz-chalcopyrite-bornite veins

Hole #2 hit 0.60% Cu, 0.21 g/t Au / 240m including 0.92% Cu, 0.42 g/t Au / 114m.
Resource drilling

By December 2010 it was evident a significant discovery had been made...

**NOW THE WORK BEGINS**

Over the next 18 months 94 holes were drilled on 100 meter centers to depths of up to 700m
Section Viewing NE  Geology

<table>
<thead>
<tr>
<th>Depth (m)</th>
<th>Width (m)</th>
</tr>
</thead>
<tbody>
<tr>
<td>188.3</td>
<td>0.77-0.29</td>
</tr>
<tr>
<td>138.0</td>
<td>0.57-0.15</td>
</tr>
<tr>
<td>125.4</td>
<td>0.56-0.18</td>
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<tr>
<td>240.6</td>
<td>0.85-0.26</td>
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</tbody>
</table>
Section Viewing ENE Sulphide minerals

- Pyrite > 2%
- Pyrite shell
- Chalcopyrite
- Chalcopyrite shell
- Cu > 0.4%
- Grade Shell
- Bornite > 0.2%
- Saprolite
- Cu > 0.4%
- Grade Shell
SECTION Viewing NE ZTEM anomalies

SHALLOW 360Hz Anomaly location

DEEP 45Hz Anomaly location

Cu ppm

- > 0.9
- > 0.7
- > 0.5
- > 0.3
- > 0.15

Grade Shells

Cu > 0.4%

Cu > 0.15%

500m
Conclusions

• A significant porphyry copper deposit was discovered beneath cover at Cobre Panama after many exploration and drilling campaigns

• ZTEM appears to map sulphide deposits in the tropical environment at Cobre Panama

• Conventional soil sampling failed to clearly identify Balboa

• Magnetics provided an unexpected signature
Important aspects of this discovery are:

- Application of deep penetrating airborne EM technique
- Integrating both geochemistry and geophysics
- Systematic application of surveys
- Willingness to apply new methods
- Management support providing sustained drill budgets
- Optimism and hard work on behalf of all those on the team
Discovery Team

Canada

Colin Burge        Frank Balint        Gary Wells
Inmet Exploration  -  Los Tres Amigos

Contractors : Geotech Limited, Toronto
Jean Legault, Harish Kumar
Paolo Beradelli

Consultants        Mike Zang

Panama

MPSA Site Geology - El Equipo Puede Hacer
Martin Clark        Aurelio Fernandez
Jacinto Cabrera     Efrain Pascual
Claudio Gonzalez    Mario Arancibia

Contractors - Cabo Drilling Panama
Herb Butler and Pat Klezli
Heliflight Panama

Consultants - Dr. David Love
ProAv Aviation, John Issenman