

MTM E14B28 Actopan  
**TECHNICAL REPORT ON THE EL COBRE PROPERTY  
VERACRUZ, MEXICO**

**Prepared For:**  
**Almaden Minerals Ltd.**  
Suite 1103, 750 West Pender St.  
Vancouver, British Columbia, Canada  
V6C 2T8

**Prepared by:**  
**APEX Geoscience Ltd.**  
Suite 410, 800 West Pender St.  
Vancouver, British Columbia, Canada  
V6C 2V6

Kristopher J. Raffle, B.Sc., P. Geo.

November 3, 2014  
Vancouver, British Columbia, Canada

---

## Table of Contents

1	Summary .....	4
2	Introduction .....	6
3	Reliance on Other Experts.....	6
4	Property Description and Location .....	7
5	Accessibility, Climate, Local Resources, Infrastructure and Physiography .....	11
6	History.....	12
7	Geological Setting and Mineralization.....	14
	7.1 Regional Geology (modified from Teliz et al., 2008).....	14
	7.2 Property Geology (modified from Teliz et al., 2008) .....	15
	7.3 Mineralization (modified from Teliz et al., 2008) .....	19
8	Deposit Types.....	20
	8.1 Porphyry Copper-Gold-Molybdenum Deposits .....	20
	8.2 High-sulphidation deposits .....	21
	8.3 Intermediate sulphidation deposits .....	21
9	Exploration.....	22
	9.1 Soil Sampling .....	22
	9.2 Rock Grab Sampling .....	23
	9.3 Stream Sediment Sampling.....	23
	9.4 Geophysics.....	26
	9.4.1 Airborne Magnetics / Radiometrics .....	26
	9.4.2 Ground Geophysics .....	29
10	Drilling.....	43
	10.1 El Porvenir and Los Banos.....	47
	10.1.1 1998 Reverse Circulation (RC) Drilling .....	47
	10.1.2 2002 Diamond Drilling.....	47
	10.1.3 2004 Diamond Drilling (modified from Barham and Noel, 2005) .....	48
	10.1.4 2008 Diamond Drilling.....	48
	10.1.5 2012 – 2013 Diamond Drilling.....	49
	10.2 Norte Zone .....	49
11	Sample Preparation, Analyses and Security .....	53
	11.1 Sample Preparation and Analyses .....	53
	11.1.1 Rock Grab, Soil and Silt Geochemical Samples .....	53
	11.1.2 RC Drilling.....	54
	11.1.3 Diamond Drill Core.....	55
	11.1.4 Author’s Drill Core and Rock Grab Samples.....	56
	11.2 Quality Assurance / Quality Control Procedures .....	56
	11.2.1 Analytical Standards .....	57
	11.2.1 Blanks .....	62
	11.2.2 Duplicates .....	63
12	Data Verification.....	65
13	Adjacent Properties.....	65
14	Other Relevant Data and Information .....	67
15	Interpretation and Conclusions .....	67
16	Recommendations.....	69
17	Date and Signature Page.....	71

18 References .....	72
19 Certificate of Author .....	74
19.1 Kristopher J. Raffle Certificate of Author .....	74
Appendix 1 – El Cobre Property Drill Hole Locations .....	75
Appendix 2 – Author’s 2014 Property Visit Analytical Certificate.....	76

List of Tables

Table 4-1. El Cobre Property Mineral Claims .....	7
Table 4-2. Mining Concession Minimum Expenditure / Production Value Requirements .....	10
Table 9-1. El Cobre 1998 – 2008 Soil Geochemical Sampling Summary Statistics .....	22
Table 9-2. El Cobre Historical Geophysical Surveys .....	26
Table 10-1. El Cobre 1998-2013 Significant Drill Hole Intercepts .....	45
Table 12-1. Authors Independent Drill Core and Rock Grab Sample Assays .....	65
Table 16-1. Proposed 2015 Drilling Budget for El Cobre.....	69

List of Figures

Figure 4-1. El Cobre Property Location .....	8
Figure 4-2. El Cobre Property Claims.....	9
Figure 7-1. Regional Geology (modified from Ferrari et. al., 2005 ) .....	16
Figure 7-2. El Cobre Property Geology .....	18
Figure 8-1. Styles of Intermediate Sulphidation, High-Sulphidation Gold, Silver, and Copper Mineralization in Porphyry and Epithermal Environments. (Modified from Sillitoe, R. H., 2010) .....	20
Figure 9-1. El Cobre Soil, Stream and Rock Geochemistry – Gold.....	24
Figure 9-2. El Cobre Soil, Stream and Rock Geochemistry - Copper.....	25
Figure 9-3. El Cobre Airborne Magnetics .....	27
Figure 9-4. El Cobre Airborne Magnetics – Central Grid Zone.....	28
Figure 9-5. El Cobre Airborne Radiometrics – Central Grid Zone .....	30
Figure 9-6. El Cobre IP / Resistivity – 200 m Chargeability Depth Slice .....	32
Figure 9-7. El Cobre IP / Resistivity – 200 m Resistivity Depth Slice .....	33
Figure 9-8. El Cobre Geophysics and Soil Samples – Los Banos Zone.....	34
Figure 9-9. El Cobre Geophysics and Soil Samples – El Porvenir Zone .....	35
Figure 9-10. El Cobre Geophysics and Soil Samples – Norte Zone.....	36
Figure 9-11. El Cobre Titan-24 Survey – Inverted Chargeability 0 m & -600 m ASL.....	38
Figure 9-12. El Cobre Titan-24 Survey – Inverted Resistivity 0 m & -600 m ASL.....	39
Figure 9-13. El Cobre Titan-24 DCIP Survey – Los Banos Zone .....	40
Figure 9-14. El Cobre Titan-24 DCIP Survey – El Porvenir Zone.....	41
Figure 9-15. El Cobre Titan-24 DCIP Survey – Norte Zone .....	42
Figure 10-1. El Cobre Drill Plan.....	46
Figure 10-2. Los Banos Zone Drill Cross Section .....	50
Figure 10-3. El Porvenir Drill Cross Section .....	51
Figure 10-4. Norte Zone Drill Cross Section.....	52
Figure 11-1. QA/QC Analytical Standards (Cu – Au) .....	59
Figure 11-2. QA/QC Analytical Standards (Mo) .....	61
Figure 11-3. QA/QC Blanks.....	62

Figure 11-4. QA/QC Duplicates..... 64  
Figure 16-1. El Cobre Proposed 2015 Drill Holes ..... 70

## 1 Summary

This Technical Report (the “Report”) is written for the El Cobre Property (the “Property”), which is held 100 percent (%) by Minera Gavilán S.A. de C.V. (“Minera Gavilán”), a wholly owned subsidiary of Almaden Minerals Ltd. (“Almaden”). The El Cobre Property has a total area of 7,456.4 hectares (ha) and is located 75 kilometres (km) northwest of Veracruz, Mexico. During 2014, Almaden retained APEX Geoscience Ltd. (“APEX”) to complete an independent Canadian National Instrument (NI) 43-101 Technical Report specific to the El Cobre Property. The author of the Report, Mr. Kristopher J. Raffle, P.Geol., Principal of APEX and an independent qualified person as defined by the NI 43-101, conducted a property visit on September 16, 2014.

Between 1998 and 2013 Almaden and partners completed airborne magnetic-radiometric, surface Induced Polarization (IP) / resistivity and Titan-24 DCIP/MT (direct current IP / magnetotelluric) geophysical surveys, in addition to extensive soil geochemistry, geologic mapping, reverse circulation (RC) and diamond drilling at the El Cobre Property. Exploration has resulted in the definition of three areas of porphyry and epithermal copper-gold mineralization known as the Los Banos, El Porvenir and Norte zones over a distance of 5 km.

Surface mapping and soil geochemical surveys over the three zones define copper-gold-molybdenum (Cu-Au-Mo) and lead-zinc-silver-gold (Pb-Zn-Ag-Au) soil anomalies. The Cu-Au-Mo anomalies are associated with porphyritic monzodiorite intrusive rocks showing early potassic (potassium-feldspar ± biotite-magnetite) alteration associated with malachite (thin fractures in surface outcrop), chalcopyrite and traces of bornite (in drill core). Distinct Pb-Zn-Ag-Au soil anomalies are spatially separated from the porphyry zones (defined by Cu-Au-Mo soil anomalies) and may represent a younger mineralization episode (or a higher-level mineral zone). At surface, Pb-Zn-Ag-Au anomalies are associated with broad areas of quartz vein float hosted within clay and sulphate (acid-sulphate) altered volcanic rocks typical of intermediate sulphidation veins, commonly associated with and adjacent to lithocaps of high-sulphidation deposits.

The Los Banos, El Porvenir and Norte zones are associated with prominent airborne magnetic and IP chargeability anomalies. Limited RC and diamond drill testing has returned wide intercepts of porphyry copper-gold; and narrow zones of epithermal gold-silver mineralization. At El Porvenir, 7 holes intersected mineralized porphyry zones averaging greater than 0.10% Cu and 0.10 grams-per-tonne (g/t) Au over 130 metres (m). Hole EC-13-004 intersected 0.23% Cu and 0.36 g/t Au over 106 m, to a depth of 504 m, indicating significant mineralization at depth in the El Porvenir Zone. In the Los Banos Zone, hole CB5 intersected a zone of significant clay alteration, quartz veining and silicification grading 1.63 g/t Au and 0.12% Cu over 15 m. All five drill holes in the Norte Zone intersected porphyry-style mineralization. Hole 08-CBCN-022, one of the deepest holes drilled at Norte, returned values of 0.14% Cu with 0.19 g/t Au over 259 m and 08-CBCN-19 intersected 41.15 meters averaging 0.42 g/t gold and 0.27% copper to the end of the hole. All of the zones remain open along strike and at depth, with numerous drill holes terminating in mineralization.

The IP data indicate that the majority of the strongly chargeable zones have significant depth. 3D inversions suggest that the anomalies associated with each of the mineralized zones at El Cobre extend below the depth tested by the current drilling. Results from the Titan-24 survey reaffirm this interpretation. Chargeabilities in excess of 80 milliradians (mrad) are observed in coincidence with low resistivity areas in the Los Banos, El Porvenir, and Villa Rica zones. A weaker chargeability response associated with moderate to high resistivity is observed in the Norte Zone.

Several anomalous areas remain untested by drilling, including the Villa Rica Zone that is defined by a strong north-northwest trending magnetic-chargeability high and associated copper-gold soil geochemical anomaly. A gold in soil anomaly is centred approximately 1200 m west-southwest of the Norte Zone. This area is referred to as the Cerro Marin Zone and is coincident with a significant magnetic low. Approximately one kilometre west-southwest of the Los Banos Zone, a discrete sub-vertical chargeability high occurs, which lacks a significant magnetic anomaly. The anomaly is associated with an approximately 600 x 600 m copper-gold soil geochemical anomaly. At the north end of the Los Banos zone a significant copper-gold soil geochemical anomaly lies at the north end of a northeast trending linear magnetic anomaly tested in part at its south end by drill hole CB5, which intersected significant copper-gold mineralization.

Based on the presence of porphyry copper-gold and epithermal gold mineralization exposed at surface and intersected by RC and diamond drill holes, favourable geology, and high priority coincident magnetic-chargeability geophysical, copper and gold in soil geochemical anomalies; the El Cobre Property is of a high priority for follow-up exploration. The 2015 exploration program should include but not be limited to: diamond drilling of approximately 9 holes totalling 7,000 m designed to test combined magnetic and IP chargeability plus copper-gold soil geochemical anomalies at El Cobre. Specifically, drilling should be carried out in two phases. The Phase 2 exploration is contingent on the results of Phase 1 exploration. Phase 1 drilling should include diamond drilling of an initial 4 holes totalling 3,000 m followed by Phase 2 drilling of an additional 5 holes totalling 4,000 m. The estimated cost to complete Phase 1 and Phase 2 drilling is \$770,000.00.

More specifically, the Phase 1 and Phase 2 exploration should include: 1) Two (2) holes totalling 2,000 m designed to target untested magnetic-chargeability geophysical and coincident copper-gold soil geochemical anomalies at the Villa Rica Zone. 2) Two (2) holes totalling 1,200 m designed to test the Norte Zone chargeability anomaly at depth where previous diamond drill holes 08-CBCN-19, 08-CBCN-22 and 08-CBCN-42 ended in porphyry copper-gold mineralization. 3) One (1) drill hole totalling approximately 700 m designed to target the untested chargeability and copper-gold soil anomaly located 1 km west of the Los Banos Zone. 4) Four (4) holes totalling approximately 3,100 m designed to test at depth a significant chargeability anomaly at the Los Banos zone and confirm previous RC drill hole results from CB5, CB12 and CB13 that ended in mineralization.

## 2 Introduction

This Technical Report (the “Report”) is written for the El Cobre Property (the “Property”), which is held 100 percent (%) by Minera Gavilán S.A. de C.V. (“Minera Gavilán”), a wholly owned subsidiary of Almaden Minerals Ltd. (“Almaden”). The El Cobre Property has a total area of 7,456.4 hectares (ha) and is located 75 kilometres (km) northwest of Veracruz, Mexico (Figure 4-1).

During 2014, Almaden retained APEX Geoscience Ltd. (“APEX”) to complete an independent Canadian National Instrument (NI) 43-101 Technical Report specific to the El Cobre Property. The author of the Report, Mr. Kristopher J. Raffle, P.Geo., Principal of APEX and an independent qualified person as defined by the NI 43-101, conducted a property visit on September 16, 2014.

This report is written to comply with standards set out in National Instrument (NI) 43-101 developed by the Canadian Securities Administration (CSA), and is a technical summary of available geologic, geophysical, geochemical and diamond drill hole information. The author, in writing this report used sources of information as listed in the references section. Government reports were prepared by qualified persons holding post-secondary geology, or related university degree(s), and are therefore deemed to be accurate. These reports, which were used as background information, are referenced in this Report in the “Geological Setting and Mineralization” section below. Unless otherwise stated, all units used in this report are metric, all dollar amounts (\$) are in Canadian currency, and Universal Transverse Mercator (UTM) coordinates in this report and accompanying illustrations are referenced to the North American Datum 1927 (NAD27) Zone 14.

## 3 Reliance on Other Experts

With respect to legal title to the El Cobre mining claim, the author has relied on the Mexico Secretary of Economy, Integrated System of Mining Administration (SIAM) website (<http://www.economia-dgm.gob.mx/cartografia/>) where as of November 3, 2014 the claims comprising the El Cobre Property are shown as being in good standing and held 100% by Minera Gavilán S.A. de C.V., a wholly owned subsidiary of Almaden; Minera Cardel S.A. de C.V., a wholly owned subsidiary of Goldgroup; and Yolanda Alvarez Gudini, with whom Almaden has executed property agreements.

## 4 Property Description and Location

The El Cobre Property has a total area of 7,456.4 hectares (ha) and is located adjacent to the Gulf of Mexico, about 75 kilometres (km) northwest of the city of Veracruz, within the state of Veracruz, Mexico (Figure 4-1). It is bounded by latitudes 19°35.0' N and 19°41.1' N, and longitudes 96°27.2' W and 96°32.7' W, and is centred at approximately 19°38' N latitude and 96°30' W longitude. The Property is located within the 1:50,000 scale Mexican Topographic Map sheet E14B28 Actopan.

Table 4-1. El Cobre Property Mineral Claims

Claim Number	Claim Name	Title Holder	Acquired
218457	CABALLO BLANCO III	YOLANDA ALVAREZ GUDINI	05/11/2002
218955	CABALLO BLANCO V	YOLANDA ALVAREZ GUDINI	28/01/2003
221152	REYNA NEGRA FRACCION 2	MINERA GAVILAN, S.A. DE C.V.	03/12/2003
223360	CABALLO BLANCO VIII	MINERA GAVILAN, S.A. DE C.V.	03/12/2004
224416	REDUCCION REYNA NEGRA F. 4	MINERA GAVILAN, S.A. DE C.V.	04/05/2005
234279	REY NEGRO	MINERA CARDEL, S.A. DE C.V.	10/06/2009
237440	C. B. X-a	MINERA GAVILAN, S.A. DE C.V.	16/12/2010
240776	CABALLO BLANCO IX FRACCION 1	MINERA GAVILAN, S.A. DE C.V.	28/06/2012

Historically, the El Cobre Property formed part of Almaden's larger Caballo Blanco Property. Pursuant to an agreement between Almaden and Goldgroup Mining Inc. ("Goldgroup") dated February 5, 2010, Goldgroup gained the right to acquire a 70% interest in Almaden's 100% owned Caballo Blanco project under the condition that a portion of the Caballo Blanco Property, the El Cobre Property, be transferred to a new entity, owned 60% by Almaden and 40% by Goldgroup (Cuttle and Giroux, 2012). Subsequently, on October 17, 2011 Almaden closed an agreement with Goldgroup to sell its remaining 30% interest in the Caballo Blanco Property and to acquire 100% interest in the El Cobre Property (Poliquin, 2011).

The El Cobre Property, as defined under the terms of Almaden's agreement with Goldgroup, forms an irregular polygon comprising a portion of eight (8) mineral claims registered to Minera Gavilán S.A. de C.V., a wholly owned subsidiary of Almaden; Minera Cardel S.A. de C.V., a wholly owned subsidiary of Goldgroup; and Yolanda Alvarez Gudini, with whom Almaden has executed a property agreement (Table 4-1; Figure 4-2). According to the property agreement with Yolanda Alvares Gudini, El Cobre is subject to the following sliding scale royalty to be paid to an individual (Charlie Warren):

1. A royalty of 0.625% if obtaining benefit of up to 1,000 tons per day.
2. A royalty of 0.50% if obtaining benefit from 1,001 to 1,500 tons per day.
3. A royalty of 0.375% if obtaining benefit from 1,501 to 10,000 tons per day.
4. A royalty of 0.25% if obtaining benefit from 10,001 tons or more per day.

Figure 4-1. El Cobre Property Location

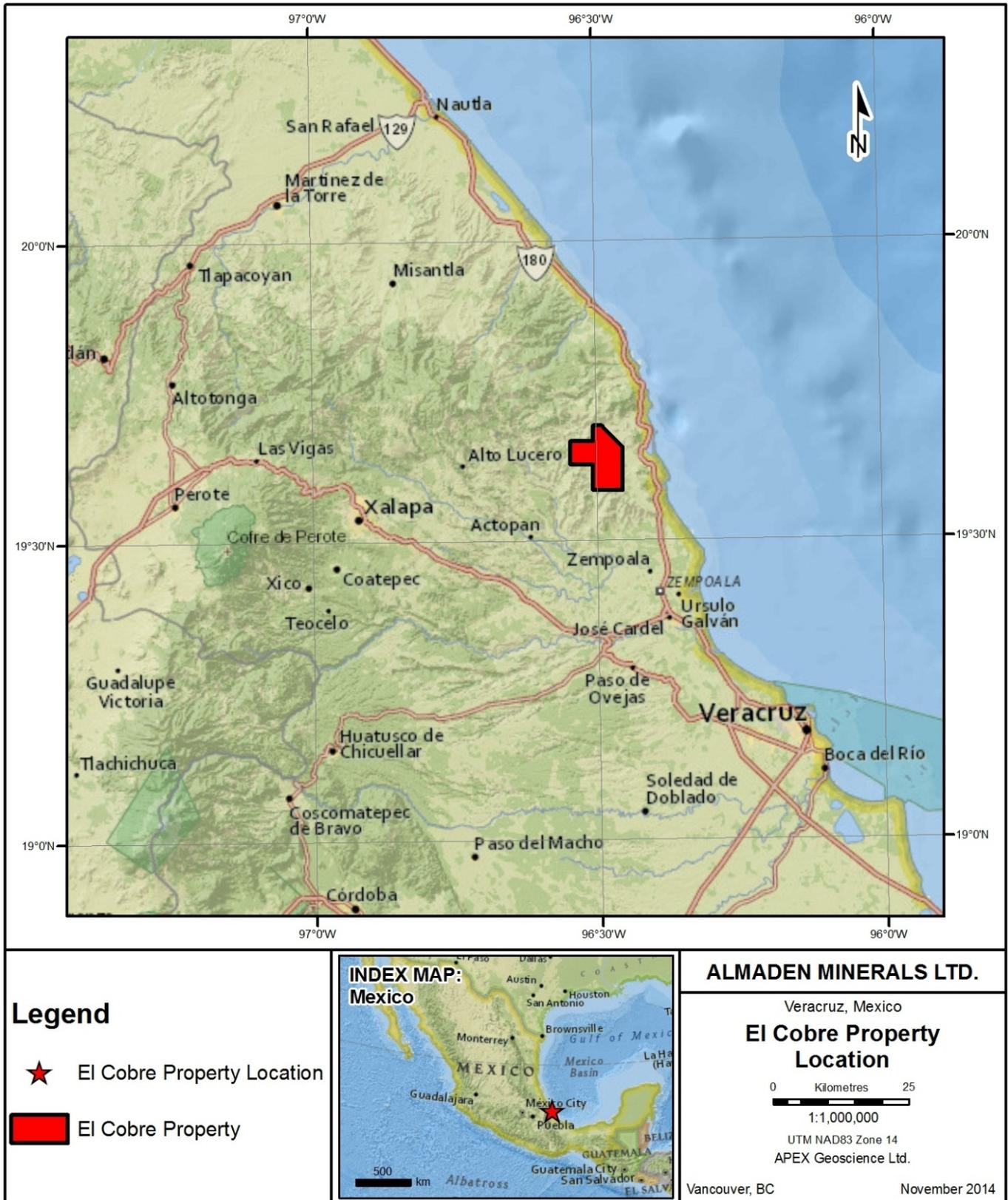
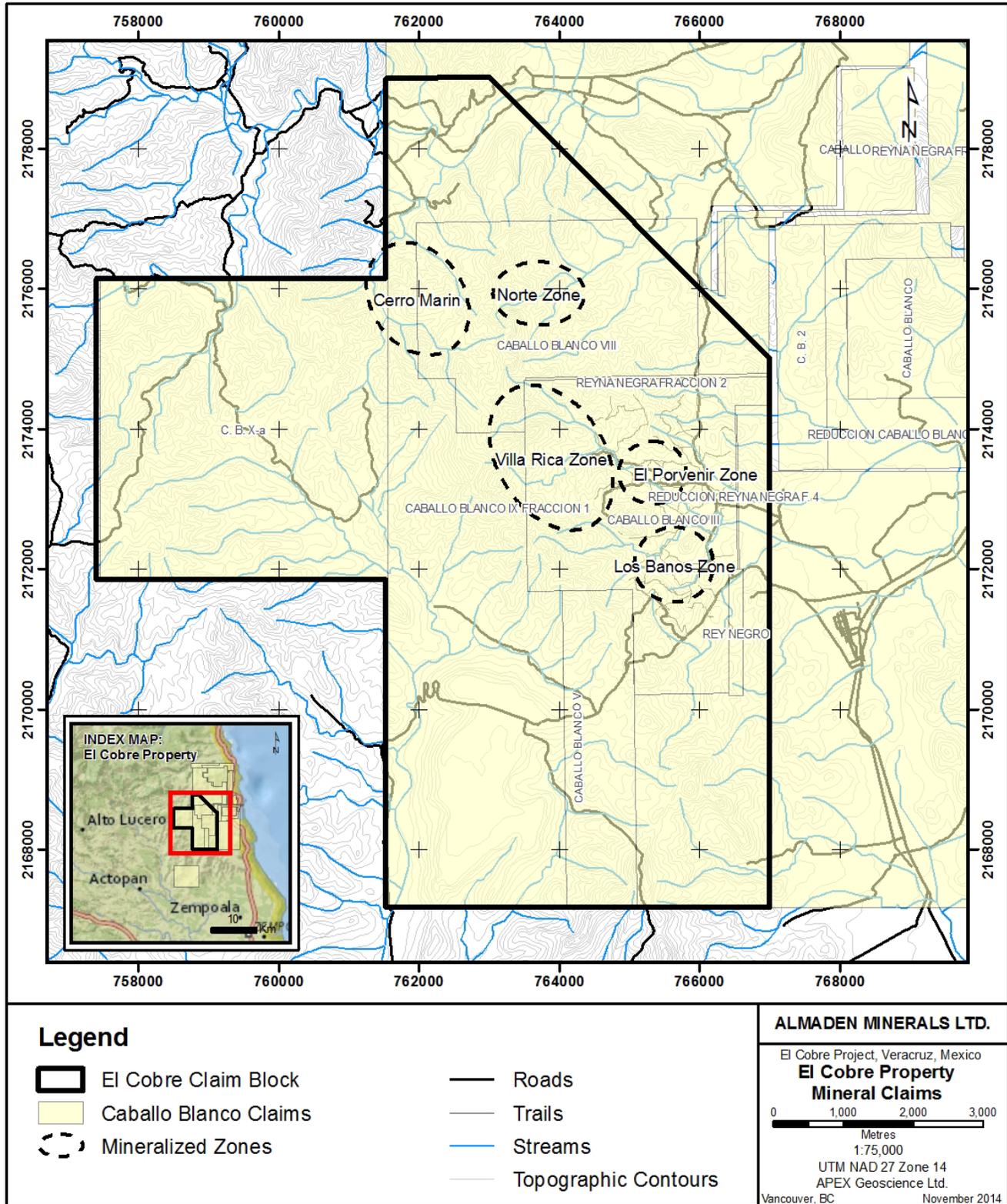


Figure 4-2. El Cobre Property Claims



Following an amendment to the Mining Law of Mexico (the “Mining Law”) on April 28, 2005, there is no longer a distinction between exploration mining concessions and exploitation mining concessions. The Mining Law permits the owner of a mining concession to conduct exploration for the purpose of identifying mineral deposits and quantifying and evaluating economically usable reserves, to prepare and to develop exploitation works in areas containing mineral deposits, and to extract mineral products from such deposits. Mining concessions have a duration of 50 years from the date of their recording in the Registry, and may be extended for an equal term if the holder requests an extension within five years prior to the expiration date.

To maintain a claim in good standing, holders are required to provide evidence of the exploration and/or exploitation work carried out on the claim under the terms and conditions stipulated in the Mining Law, and to pay mining duties established under the Mexican Federal Law of Rights, Article 263. Exploration work can be evidenced with investments made on the lot covered by the mining claim, and the exploitation work can be evidenced the same way, or by obtaining economically utilizable minerals. The Regulation of the Mining Law indicates the minimum exploration expenditures or the value of the mineral products to be obtained (Table 4-2).

Table 4-2. Mining Concession Minimum Expenditure / Production Value Requirements

Area (hectares)	Fixed quota in Pesos (CAD\$)*	Additional annual quota per hectare in Pesos (CAD\$ per hectare)*			
		1 <sup>st</sup> year	2 <sup>nd</sup> to 4 <sup>th</sup> year	5 <sup>th</sup> to 6 <sup>th</sup> year	7 <sup>th</sup> year and after
<30	262.24 (20.98)	10.48 (0.84)	41.95 (3.36)	62.93 (5.03)	63.93 (5.11)
30 - 100	524.49 (41.96)	20.97 (1.68)	83.91 (6.71)	125.88 (10.07)	125.88 (10.07)
100 - 500	1,048.99 (83.92)	41.95 (3.36)	125.88 (10.07)	251.75 (20.14)	251.75 (20.14)
500 - 1000	3,146.98 (251.76)	38.81 (3.10)	119.91 (9.59)	251.75 (20.14)	503.51 (40.28)
1000 - 5000	6,293.97 (503.52)	35.66 (2.85)	115.39 (9.23)	251.75 (20.14)	1,007.03 (80.56)
5000 - 50000	22,028.92 (1,762.31)	32.52 (2.60)	111.19 (8.90)	251.75 (20.14)	2,014.07 (161.13)
> 50000	209,799.28 (16,783.94)	29.37 (2.35)	104.9 (8.39)	251.75 (20.14)	2,014.07 (161.13)

\* Using a conversion of 1 Mexican Peso = 0.08 CAD\$

The El Cobre Property is currently subject to annual exploration/exploitation expenditure requirements of approximately \$68,125 per year.

Subject to the Mexico Mining Laws, any company conducting exploration, exploitation and refining of minerals and substances requires previous authorization from the Secretary of Environment and Natural Resources (SEMARNAT). Because mining exploration activities are regulated under Official Mexican Norms (specifically NOM-120)

submission of an Environmental Impact Statement (“Manifestacion de Impacto Ambiental” or “MIA”) is not required provided exploration activities to not exceed disturbance thresholds established by NOM-120. Exploration activities require submission to SEMARNAT of a significantly less involved Preventive Report (“Informe Preventivo”) which outlines the methods by which the owner will maintain compliance with applicable regulations. If the exploration activities detailed within the Preventive Report exceed the disturbance thresholds established by NOM-120, SEMARNAT will inform the owner that a MIA is required within a period of no more than 30 days.

The present scale of exploration activities within the El Cobre Property are subject to NOM-120 regulation. In future, if significantly increased levels of exploration activities are anticipated, submission of an Environmental Impact Statement may be required. Almaden has negotiated surface land use agreements with landowners within the area affected by diamond drilling activities.

At present, the author is not aware of any environmental liabilities to which the Property may be subject, or any other significant risk factors that may affect access, title, or Almaden’s right or ability to perform work on the Property.

## 5 Accessibility, Climate, Local Resources, Infrastructure and Physiography

The El Cobre Property is located adjacent to the Gulf of Mexico about 75 km northwest of the city of Veracruz in the state of Veracruz, Mexico. Veracruz is a major port city and naval base with an international airport with numerous daily flights to and from Mexico City and other national and international destinations.

The Property can be accessed easily from Veracruz via the Veracruz-Alamo Highway (HWY 180) and the Tinajitas-Palma Road. Following the Veracruz-Alamo Highway north to El Farallon, take the Tinajitas-Palma Road southeast towards the town of Tinajitas. A network of secondary and dirt roads provide access to most of the Property.

The nearest supply center is Cardel, a town of 20,000 located approximately 30 km south of the claim block. Less than 10 km northeast of the Property sits Mexico’s only nuclear power plant at Laguna Verde. Its location allows easy access to the Mexican electrical power grid. Water is relatively abundant in small creeks at elevations below 200 metres (m), throughout most of the year.

The Property is characterized by hilly and partly forested agricultural land. The terrain reaches a maximum elevation of 600 m.

The climate is sub-tropical with a rainy season from late June until the middle of November. Occasional hurricanes affect the region during this time of the year. In general, weather conditions favor field operations during the drier part of the year from mid-November to June.

## 6 History

The present day El Cobre Property covers an area historically referred to as the Central Grid Zone of the Caballo Blanco Property. The El Cobre Property was separated from the adjacent Caballo Blanco Property in 2010. All historical exploration programs and ownership discussed in this section, and in the Exploration and Drilling sections of this report, are focused on the Central Grid Zone and El Cobre Property.

Mineralization was first discovered at Caballo Blanco in 1993 by Charles Warren of Whitehorse, Yukon. He collected samples of clay altered volcanic rocks from a road cut along the Pan American Highway, assaying up to 8 grams-per-tonne (g/t) gold. In 1994 he staked several claims covering the area now known as the Highway Zone (Barham and Noel, 2005). The property was subsequently optioned to Minera Gavilán S.A. de C.V., a wholly-owned subsidiary of Almaden, who staked claims to cover two additional areas, known as the Northern Zone and the Central Grid Zone (Cuttle and Giroux, 2012).

Between 1995 and 1998, Almaden completed extensive exploration work focused on porphyry copper-gold (Cu-Au) and epithermal gold-silver (Au-Ag) targets in the Central Grid Zone. A grid was established with east-west lines spaced 100 metres (m) apart over a 3.5 by 3 kilometre (km) area. Soil sampling was completed at 25 m spacing. Large coincident Cu-Au and Cu-Au-Pb-Zn (lead-zinc) anomalies were identified associated with mineralized outcrop and float. A gradient array induced polarization (IP) geophysical survey was carried out over the grid. The survey identified numerous zones of elevated chargeability within the Central Grid area. These zones correspond well to anomalous soil geochemistry, zones of vein float and outcropping mineralization (Poliquin, 1998).

Ground magnetic work in the Central Grid Zone resulted in the definition of several magnetic highs associated with elevated chargeability, soil geochemical anomalies and exposed porphyry style mineralization (Barham and Noel, 2005).

During April and May of 1998, seventeen reverse circulation (RC) drill holes, totalling 2,395 m, were completed targeting IP chargeability anomalies, anomalous soil geochemistry and mineralized outcrop in the areas presently referred to as the El Porvenir and Los Banos Zones. Several holes intersected porphyry copper-gold mineralization associated with potassium-silicate and sericite-pyrite alteration (Poliquin, 1998). The best result was returned from drill hole CB04 which intersected 1.19 g/t Au and 0.12 % Cu over 48 m, including 3.83 g/t Au and 0.37 % Cu over 12 m, within the El Porvenir Zone.

In 2001, Almaden optioned the Caballo Blanco Property to Noranda Inc. ("Noranda"). During 2002, Noranda completed four vertical diamond drill holes, totalling 1,145 metres, at the El Porvenir and Los Banos Zones. No significant Cu-Au mineralization was intersected. Two further holes were drilled, totalling 163 m, at Almaden's expense; again, no significant assay results were reported. Noranda terminated its option in the fall of 2002.

In December 2002, Almaden signed a joint-venture agreement with Comaplex Minerals Corp. (“Comaplex”) proposing to spend US \$2 million over four years to explore the Caballo Blanco Property. Comaplex carried out a variety of geological work throughout Caballo Blanco, targeting the Central Grid Zone (now the El Cobre Property), the Highway Zone and the Northern Zone (both outside the current Property). Two diamond drill holes, totalling 516 m, were completed within the El Porvenir Zone. Drill hole DDH04CB1 averaged 0.38 g/t Au and 0.16% Cu over 298 m, the entire length of the hole. The second hole did not return significant results. Comaplex completed the required expenditures of the joint venture agreement and went on to earn a 60% interest in Caballo Blanco Property, including the Central Grid Zone. In February 2007, Almaden purchased Comaplex’s 60% interest for a cash payment of US\$1.25 million.

In April 2007, Almaden optioned Caballo Blanco to Canadian Gold Hunter Corp. (“CGH”). Extensive exploration work was conducted between 2007 and 2009, which included the establishment of a cut-and-flagged picket grid, soil geochemical sampling, IP and ground magnetometer surveys, prospecting, geological mapping, access road construction and diamond drilling. The geophysical and geochemical survey grids extended the 1998 grids to the north and west, which led to the discovery of the Norte Zone. A total of 64 line-km of ground IP/Mag were surveyed, 1,238 soil and 10 rock samples were collected, and 10 holes were drilled, totalling 2,837 metres. Drill hole 08-CBCN-022 intersected 0.19 g/t Au and 0.14% Cu over 259 m, including 0.30 g/t Au and 0.20 % Cu over 54.7 m within the Norte Zone. Hole 08-CBCN-019, also drilled at the Norte Zone, intersected 0.27% Cu and 0.42 g/t Au over 41.15 m.

In January 2008, the geophysics department of the Servicio Geologico de Mexico (SGM) completed a helicopter-borne magnetic and radiometric survey over the northern half of Caballo Blanco Property, covering the northern half of the Central Grid Zone.

In September 2009, CGH changed its name to NGEx Resources Inc. and later in November signed a ‘share purchase agreement’ allowing Goldgroup Mining Inc. to earn a 70% interest in the Caballo Blanco Property (Cuttle and Giroux, 2012).

In February 2010, the area of present day El Cobre Property was defined and separated from Caballo Blanco Property. Pursuant to an agreement between Almaden and Goldgroup, the El Cobre Property was transferred to a new entity, owned 60% by Almaden and 40% by Goldgroup (Poliquin, 2010).

In October of 2011, Almaden sold its 30% interest in the Caballo Blanco Project and re-acquired 100% interest in the El Cobre Property (Poliquin, 2011).

## 7 Geological Setting and Mineralization

### 7.1 Regional Geology (modified from Teliz et al., 2008)

The El Cobre Property is located at the intersection of the Trans-Mexican Volcanic Belt (at its eastern extremity) and the NNW-SSE trending Eastern Alkaline Province. Regionally, the area is located over a tectonic high known as the Teziutlan Massif, which has a Paleozoic (metamorphic-intrusive-metasedimentary) basement. The Teziutlan massif divides the Tampico-Misantla Basin and the Veracruz Basin, respectively to the north and south. Such basement underlies marine Mesozoic rocks (Gomez-Tuena, et al., 2003).

The Trans-Mexican Volcanic Belt (TMVB) has been defined as a continental magmatic arc formed by more than 8,000 volcanic edifices and a few intrusive bodies that extends from the Pacific to the Gulf coast in Central Mexico (1,000 km long and up to 230 km wide), with a general E-W orientation. The TMVB is controlled by a complex extensional tectonic regime, whose volcanic products are underlain by basements with widely different ages, compositions and thicknesses. Calc-alkaline and alkaline rocks are distributed all along the TMVB; however alkaline rocks (Na-K) tend to be more abundant at both the west and east ends of the TMVB (Orozco-Esquivel, et al., 2007).

The Eastern Alkaline Province (EAP) was considered as an independent Cenozoic magmatic province with alkaline rocks, related to extensional faulting parallel to the Gulf of Mexico coast, extending from the state of Tamaulipas in the north southward to the Los Tuxtlas Range in the State of Veracruz (Demant and Robin, 1975 in Orozco-Esquivel, et al., 2007).

The volcanism near the Property area is linked to the evolution of the TMVB. Several geological episodes have been distinguished during the time evolution of the TMVB (Orozco- Esquivel, et al., 2007 and Ferrari, et al., 2005). These episodes are well represented around the Property (Figure 7-1).

**a) Middle to late Miocene episode:** This stage is defined by the emplacement of plutonic and sub- volcanic bodies of gabbroic to dioritic, calc-alkaline composition (15-11 Ma), with an adakitic geochemical signature (implying partial fusion of a subducted slab during a period of sub-horizontal to shallow-dipping subduction) (Gomez-Tuena, et al., 2003). In this way, the earliest magmatic activity around the Property was strongly influenced by melting of the subducted oceanic crust. At the end of the adakitic period, there followed a regional uplift, correlated to an episode of sub-volcanic and intrusion emplacement (Gomez-Tuena, et al., 2003).

The intrusive rocks are described as micro-porphyritic to microcrystalline (hypabyssal), found with sulphides, propylitic alteration and normally cut by mafic dikes. These rocks have been dated as 17 Ma (Laguna Verde microdiorite, NE comer of the property), 14.6 Ma (Plan de las Hayas, north of the project) and 13-11 Ma (El Limon, western edge of the property) for some Gabbros. This initial phase of magmatism in the area resulted in some products being emplaced to the east within the present Gulf of Mexico (Ferrari, et al., 2005).

**b) Late Miocene episode:** Mafic volcanic rocks were emplaced as fissure basaltic flows, commonly forming plateaus or mesas, with ages reported in the area between 7.5 to 6.5 Ma (Lopez-Infanzon, 1991; Ferrari et al., 2005). Intermediate, sub-alkaline, subduction-related volcanism changed at about 7.5 Ma to mafic alkaline volcanism in the area (Chiconquiaco-Palma Sola volcanic fields to the north of the Property). Such an abrupt change in the nature of the volcanism has been ascribed to a sudden change in the magma source (Orozco- Esquivel, et al., 2007).

An unconformity, associated with several tens of metres of volcanoclastic rocks is reported between the Middle to late Miocene intrusions and late Miocene lava flows. Dating done by Cantagrel and Robin (1979) (in Gomez-Tuena, 2007) has reported ages of 6.5 Ma and 7.5 Ma for dacites domes in Cerro Metates (eastern part of the property). A dioritic intrusion has been dated as 7.3 Ma (Zempoala, 20 km to the south of the property). This intrusion is considered as hypabyssal magmatism, the time equivalent to the basaltic plateau volcanism in the area (Ferrari, et al., 2005).

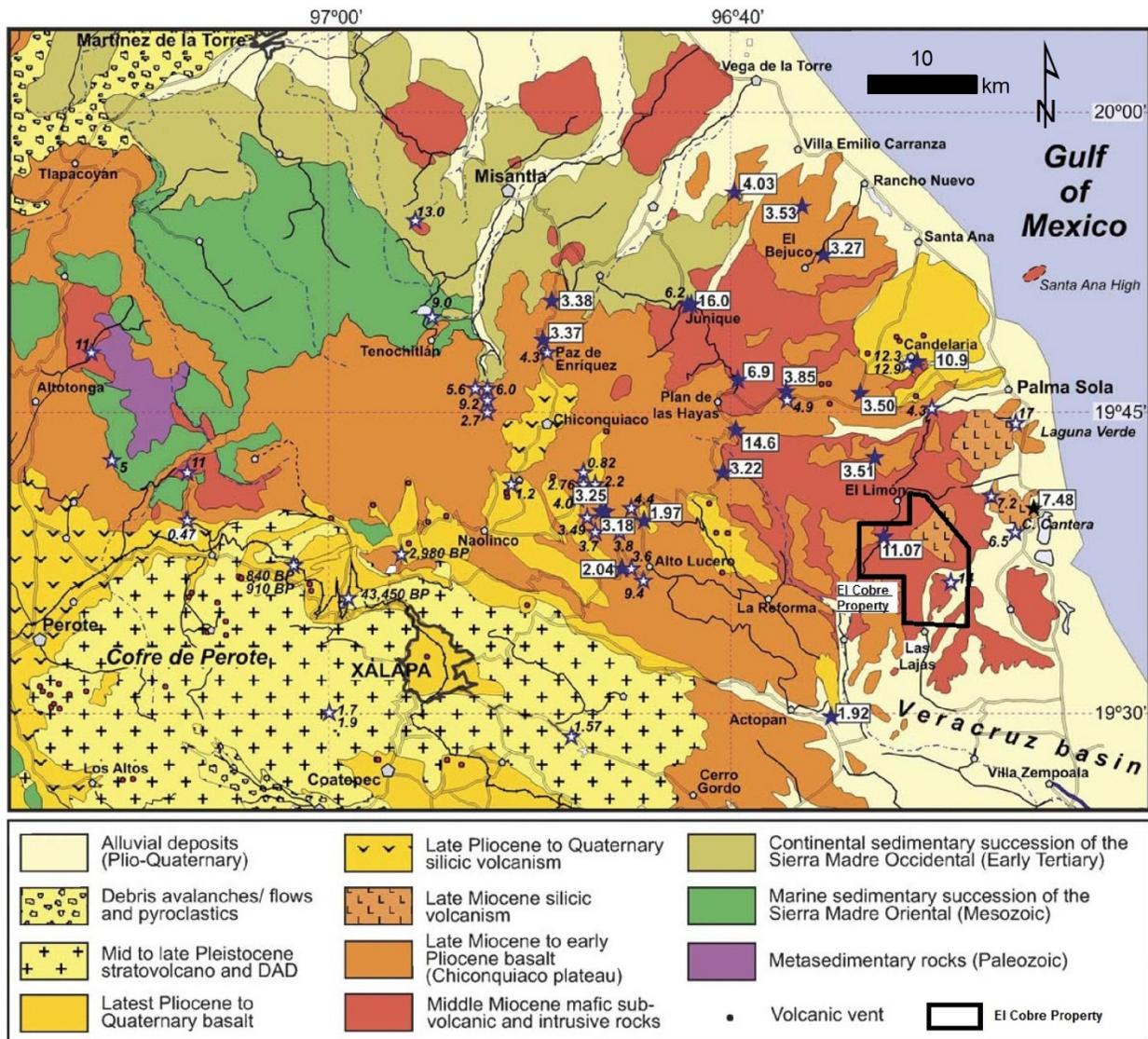
**c) Early-Late Pliocene bimodal volcanism episode:** The magmatic products around the Property area derive from the partial fusion of a relatively deeper mantle with the geochemical signature of an enriched mantle wedge (Orozco-Esquivel et al., 2007). Ages of 4.0 and 3.1 Ma were obtained for plateau basalt to the north of the property (Plan de Hayas). A few km to the south of the property (Actopan and Alto Lucero), highly potassic younger volcanic rocks overlying the plateau succession have been dated at 2.24 to 1.97 Ma (Gomez-Tuena, 2007).

**d) Late Pliocene to Quaternary episode:** Basaltic to andesitic volcanic products of alkaline composition occur in the Palma Sola region (north edge of the Caballo Blanco property). The most recent volcanic rocks do not show signs of the subducted oceanic crust but have been influenced by contamination with the local continental crust (Orozco-Esquivel, et al., 2007). Quaternary volcanic rocks reach a thickness of up to 800 m (to the west of the property area), abruptly thinning to the east to tens of metres in the coastal zone (Ferrari, et al., 2005).

## 7.2 Property Geology (modified from Teliz et al., 2008)

Geological mapping was done at 1:25,000 scale covering all of the Caballo Blanco Property during the 2007 – 2008 CGH program. Detailed mapping of El Cobre (Central Grid Zone) was completed by Michael Cooley, consulting geologist for CGH, at 1:2,500 scale during the same work period (Figure 7-2).

Figure 7-1. Regional Geology (modified from Ferrari et. al., 2005 )



Volcaniclastics and dacitic tuffs and flows are the main rocks mapped in the target areas of El Cobre, bounded by major faults, which define a large and favourable structural-stratigraphic (and preserved) window. Different dioritic, monzodiorite and monzonitic intrusive rocks are described (from surface and drill hole data), showing early potassic (K-spar ± biotite-magnetite) alteration associated with malachite (thin fractures in surface outcrop), chalcopyrite and traces of bornite (in drill core). A later sericite event overprints and replaces the potassic alteration, converts magnetite to hematite (and ultimately pyrite) and may have leached at least a part of the earlier copper (and gold). At Norte Zone, sericite alteration extends into the overlying quartz-eye dacite crystal tuffs. Late, fine drusy quartz-sericite veins with minor chalcopyrite, galena and sphalerite cut monzodiorite at El Porvenir (Teliz et al., 2008).

The middle Miocene to Quaternary stratigraphic units mapped within the Property area are presented below from oldest to youngest.

Dioritic Intrusions and Dioritic Dikes are set of plutons, which represent the oldest rocks in the property; they are referred to as the middle-late Miocene basement for the overlying differentiated sequence of volcanic and volcano-sedimentary rocks in the area. They have, in general, a dioritic composition (diorite and probably some gabbros with a wide range of textures), are interpreted to have been emplaced during a period of extension and likely represent magmatic feeder systems for younger (or coeval) mafic and intermediate flows. The main exposure of these rocks is located to the northeast of the Property.

Mafic-Intermediate Flows are formed by different basaltic to andesitic flows, with different textures including microcrystalline, feldspar-pyroxene porphyritic and amygdaloidal. This unit is mapped in the southern half of the Property. It is the oldest unit encountered in drilling within El Cobre.

Monzodiorite Porphyry is exposed within an erosional window at El Porvenir zone of El Cobre and has been intersected by Drill Holes in the Norte Zone of El Cobre where it underlies quartz-eye dacite crystal tuffs. In both areas monzodiorite cross-cuts older basalt and is strongly correlated with airborne magnetic highs, copper sulphides with gold and associated K-spar-magnetite alteration. A similar but more dioritic and slightly younger phase of the same intrusive suite intrudes monzodiorite at El Porvenir and monzodiorite and quartz-eye dacite crystal tuff at Norte Zone. After examining core from Norte and El Porvenir, Dr. Richard Sillitoe considered the two porphyry systems to be identical and, hence, the same age (Sillitoe, 2008).

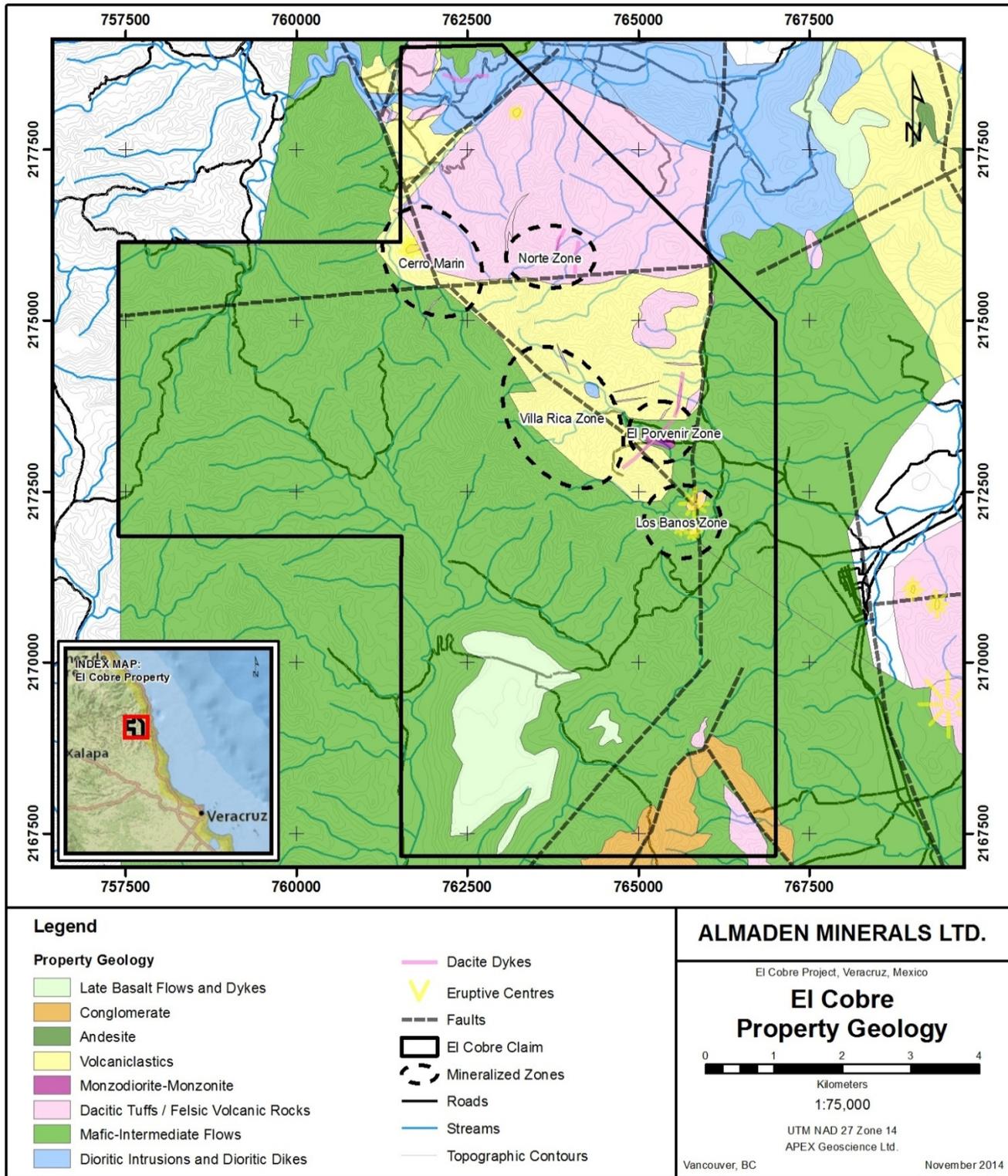
Volcaniclastics package basically consists of unsorted lithic fragments of varying compositions within a poorly sorted, fine to medium grained matrix, in addition to fine grained volcanic sands and ash layers. Bedding is rarely identified in these rocks but, where evident, it is generally gently dipping and uniform. This rock has been affected by strong hydrothermal alteration. In the El Cobre area, the volcaniclastic rocks are interbedded with or overlain by felsic volcanic rocks.

Andesite unit is composed of intermediate volcanic to sub-volcanic rocks are commonly feldspar rich and porphyritic to locally equigranular. They have been mapped within the volcaniclastic sequence (at least in the mineralized targeted areas of the property). Andesite generally has the same distribution as the volcaniclastic unit.

Dacitic Tuffs and Felsic Volcanic Rocks include flows, dikes and tuffs with medium-grained feldspars, some quartz eyes, hornblende and biotite, generally within a fine-grained matrix and sometimes containing abundant heterolithic clasts. It is mapped basically around the Norte target in the northern part of the El Cobre. The thickness of this package increases to the west, apparently indicating a westerly derived source.

Dacitic dikes, with moderate carbonate alteration mapped within this unit, are described cutting older rocks affected by potassic-magnetite alteration.

Figure 7-2. El Cobre Property Geology



Heterolithic conglomerate forms thick-to-massive-bedded, poorly consolidated and poorly sorted sedimentary units exposed south of the Property. Locally, clasts consist mainly of one rock type, suggesting localized source areas for particular conglomerate deposits. The lower-most section of this unit is contemporaneous with intermediate flows, whereas the upper contact is interpreted as contemporaneous with basalt flows. This package is interpreted as having been deposited above a fault-bonded, subsiding basin between periods of andesitic and younger basaltic volcanism

Late Basaltic Flows and Sheeted Dikes consist of aphanitic-to-fine-grained dark basalts with massive, acicular and amygdaloidal textures, commonly massive and locally banded. Typically, the flows form flat-lying to gently dipping plateaus or mesas. This unit is north of the Property.

### 7.3 Mineralization (modified from Teliz et al., 2008)

There are four copper-gold porphyry targets within the El Cobre Property: Los Banos, El Provenir, Norte, and Villa Rica; separated along an almost four kilometre trend. The porphyries are defined by distinct Cu-Au soil anomalies, discrete, positive magnetic features and an extensive IP anomaly. Drilling at the El Porvenir Zone demonstrated that the system persists at least to 400 m depth with copper and gold grades of 0.11% Cu and 0.15 g/t Au over 403 m in hole 08-CBCN-028. Drilling at the Norte Zone intersected 0.27% Cu and 0.42 g/t Au over 41 m in hole 08-CBCN-019. Both areas exhibit similar geologic characteristics including monzodiorite host rocks, potassic and sericitic alteration, and an association of hydrothermal magnetite-chalcopyrite-(bornite).

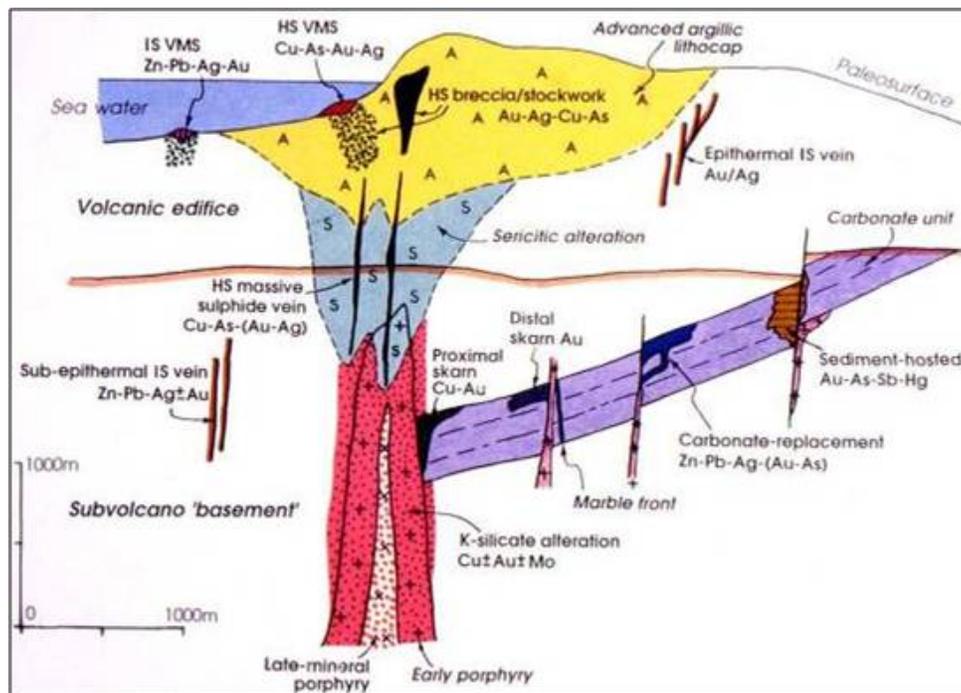
Distinct Pb-Zn-Ag-Au soil anomalies are spatially separated from the porphyry zones (defined by Cu-Au-Mo soil anomalies) and possibly represent a younger mineralization episode (or a higher-level mineral zone). Almaden Minerals drilled several of these anomalies in 1998 and reported a number of base-metal-silver-gold-barite intercepts.

Target areas at El Cobre exhibit clay, sericite and pyrite alteration (referred to as phyllic alteration). Numerous zones of quartz vein float have been identified in the area in the past and the distribution of the vein float was mapped and sampled over the entire area, which is approximately 3 km by 2 km. Comaplex completed additional sampling of the vein float with the vast majority of the samples assaying greater than 1 g/t and up to 25 g/t Au. Silver is locally present and most samples were highly anomalous in Cu, Pb and Zn. The mineralized quartz-vein float at El Cobre shares characteristics and settings that are typical of intermediate sulphidation veins, commonly associated with and adjacent to lithocaps of porphyry copper deposits. The vein float may be indicative of a larger vein deposit at depth and their structural control and depth potential are being assessed.

## 8 Deposit Types

The principal deposit-type of interest at the El Cobre Property is Porphyry Copper-Gold-Molybdenum (Cu-Au-Mo) mineralization. Drilling has confirmed that there are at least four copper-gold porphyry systems within the Property. The Property is also prospective for high and intermediate sulphidation epithermal mineralization. Intermediate sulphidation veins are defined by vein float and distinct Pb-Zn-Ag-Au soil anomalies (Figure 8-1).

Figure 8-1. Styles of Intermediate Sulphidation, High-Sulphidation Gold, Silver, and Copper Mineralization in Porphyry and Epithermal Environments. (Modified from Sillitoe, R. H., 2010)



### 8.1 Porphyry Copper-Gold-Molybdenum Deposits

In Porphyry Cu-Au-Mo deposit types, stockworks of quartz veinlets, quartz veins, closely spaced fractures, and breccias containing pyrite and chalcopyrite with lesser molybdenite, bornite and magnetite occur in large zones of economically bulk-mineable mineralization in or adjoining porphyritic intrusions and related breccia bodies. Disseminated sulphide minerals are present, generally in subordinate amounts. The mineralization is spatially, temporally and genetically associated with hydrothermal alteration of the host rock intrusions and wall rocks.

These deposit types are commonly found in orogenic belts at convergent plate boundaries, commonly linked to subduction-related magmatism. They also occur in association with emplacement of high-level stocks during extensional tectonism related to strike-slip faulting and back-arc spreading following continent margin accretion (Panteleyev, 1995).

## 8.2 High-sulphidation deposits

High-sulphidation deposits result from fluids (dominantly gases such as SO<sub>2</sub>, HF, HCl) channeled directly from a hot magma. The fluids interact with groundwater and form strong acids. These acids rot and dissolve the surrounding rock leaving only silica behind, often in a sponge-like formation known as vuggy silica. Gold and sometimes copper-rich brines that also ascend from the magma then precipitate their metals within the spongy vuggy silica bodies. The shape of these mineral deposits is generally determined by the distribution of vuggy silica. Sometimes the vuggy silica can be widespread if the acid fluids encountered a broad permeable geologic unit. In this case it is common to find large bulk-tonnage mines with lower grades.

The acidic fluids are progressively neutralized by the rock the further they move away from the fault. The rocks in turn are altered by the fluids into progressively more neutral-stable minerals the further away from the fault. As a result, definable zones of alteration minerals are almost always formed in shell-like layers around the fault zone. Typically the sequence is to move from vuggy silica (the centre of the fault) progressing through quartz-alunite to kaolinite-dickite, illite rich rock, to chlorite rich rock at the outer reaches of alteration. Alunite (a sulphate mineral) and kalonite, dickite, illite and chlorite (clay minerals) are generally whitish to yellowish in colour. The clay and sulphate alteration (referred to as acid-sulphate alteration) in high-sulphidation systems can leave huge areas, sometimes up to 100 square-km of visually impressive coloured rocks.

## 8.3 Intermediate sulphidation deposits

Intermediate sulphidation (IS) gold systems also occur in mainly in volcanic sequences of andesite to dacite composition. Some Au-rich IS systems are spatially associated with porphyry systems and high-sulphidation systems. At the deposit scale, mineralization occurs in veins, stockworks and breccias. Veins with quartz, manganiferous carbonates and adularia typically host the Au mineralization. Gold is present as native metal and as sulphides together with a variety of base metal sulfides and sulfosalts. Low-Fe sphalerite, tetrahedrite-tennantite and galena can be important mineral assemblages. IS Au veins can show classical banded crustiform-colloform textures in the veins. Permeable lithologies within the host sequence may allow development of large tonnages of low-grade stockwork mineralization. Alteration minerals in IS Au deposits are commonly zoned from quartz ± carbonate ± adularia ± illite proximal to mineralization through illite-smectite to distal propylitic alteration. Breccias may be common and can show evidence for repeated brecciation events.

## 9 Exploration

Beginning in 1997, a series of exploration programs were completed at the El Cobre Property. To date, a total of 28 rock samples, 4,575 soil samples and 54 stream sediment samples have been collected. In addition, significant geophysical work programs have been completed, comprising two airborne surveys, conventional IP / resistivity, ground magnetics and a Titan-24 direct current induced polarization (DCIP) and magnetotelluric (MT) surveys.

Based on the results of soil, rock and stream sampling described below, good correlation of surface and drilled mineralization with geochemical anomalies, and based on the results of quality assurance / quality control measures; the geochemical samples are considered representative and there are no apparent factors that may have resulted in sample biases.

### 9.1 Soil Sampling

A total of 4,694 soil samples covering an approximately 5 x 5 km area have been collected at the Property. Summary statistics for all soil sampling is provided in Table 9-1. Plan maps showing gold and copper in soil geochemical anomalies are presented in Figures 9-1 and 9-2, respectively.

Soil samples were collected by hand from a small hole dug with a non-metallic pick or hoe. The sample depth was typically 10 cm, or at least deep enough to be below the interpreted surficial organic layer. Sample bags were labelled with a unique sample number, and the sample location recorded with handheld GPS to plus or minus 5 m accuracy.

Table 9-1. El Cobre 1998 – 2008 Soil Geochemical Sampling Summary Statistics

	Au (ppb)	Ag (ppm)	Cu (ppm)	Pb (ppm)	Zn (ppm)	Mo (ppm)
<b>Mean</b>	30.6	0.30	115.8	65.6	118	3.19
<b>Median</b>	14.0	0.10	92.0	40.0	92	2.00
<b>Min</b>	0.1	0.04	0.5	1.0	0.5	0.10
<b>Max</b>	9966	30.2	3937	7443	2585	59.00
<b>70th Percentile</b>	23.7	0.30	121.0	65.0	126	4.00
<b>90th Percentile</b>	51.0	0.60	186.7	127.0	203	6.00
<b>95th Percentile</b>	80.0	0.80	258.4	177.0	277	9.00
<b>97.5th Percentile</b>	123.7	1.13	373.7	245.7	365	12.00

Soil sampling was initially carried out by Almaden in 1998 at 25 m intervals along 100 m spaced E-W lines from 2,171,000N to 2,174,400N, and 764,000E to 766,500E (Teliz et al., 2008). Two types of anomalies were noted, the first being a large copper-gold-molybdenum (Cu-Au-Mo) anomaly in the centre of the grid, coinciding with the El Porvenir and Los Banos zones. The second is characterized by a Au-Cu-Pb-Zn +/- Ag signature, with anomalies scattered throughout the grid. The highest gold value obtained was 9,966 parts-per-billion (ppb) Au, from the northeast quadrant of the grid

where a clustering of anomalous samples defines an approximately 500 m by 800 m Au in soil anomaly.

In 2007 and 2008, CGH extended soil sampling coverage to the west and north of the original grid, covering the area from 2,173,000N to 2,176,400N, and 762,000E to 765,500E, at 50 m intervals along 200 m spaced E-W lines. The program included re-sampling of lines 2,175,000N, 2,175,800N and 2,176,400N. The 2007-2008 sampling extended and defined a significant Au-Cu-Mo soil anomaly west of the El Porvenir Zone, now known as the Villa Rica Zone. The sampling also revealed a strong Cu-Au-Mo anomaly to the north of the grid, about 3 km northwest of El Porvenir Zone (Teliz et al., 2008). This area is now referred to as the Norte Zone.

The 2007 and 2008 sampling identified several other anomalous areas, including a gold in soil anomaly located approximately 1200 m west-southwest of the Norte Zone. This area is referred to as the Cerro Marin Zone, and is comprised of strongly quartz-kaolinite altered andesitic lava flows, with local propylitic alteration and oxidized quartz veins. It is coincident with a magnetic low geophysical anomaly, deep IP conductivity response and a topographic depression (basin). Sampling in 2014 extended the coverage at Cerro Marin 1.5 km west, identifying a moderate Au-Cu in soil anomaly 1 km west of the anomaly identified in 2007-2008.

## 9.2 Rock Grab Sampling

A total of 34 rock samples were collected to the west and north of El Porvenir where magnetic and chargeability geophysical anomalies coincide with Cu-Au soil geochemical anomalies.

Rock grab samples collected by Almaden were from both from representative and apparently mineralized lithologies in outcrop, talus and transported boulders within creeks throughout the Property. Rock samples ranging from 0.5 to 2.5 kilograms (kg) in weight and were placed in uniquely labelled poly samples bags and their locations were recorded using handheld GPS accurate to plus or minus 5 m accuracy.

Sample 5438, collected from a 1 m vuggy quartz vein angular boulder, returned the highest gold value of 1.51 g/t Au. Sample 5435, collected from a specular hematite vein in a strongly altered crystal lithic tuff, returned the highest copper value of 0.16% Cu. Both of these samples were collected from the Norte Zone. Four other samples returned gold values ranging between 0.10 to 0.52 g/t Au, collected from isolated areas outside El Porvenir and Norte Zones. All other samples returned insignificant assay values (Figures 9-1 and 9-2).

## 9.3 Stream Sediment Sampling

A total of 54 stream sediment silt samples were collected at the Property during the 2008 and 2009 field programs by CGH. Samples were collected from second order drainages covering the Property at a density of about 1 sample per square-km.

The specific sample collection methods employed by CGH are not known, however the author has no reason to samples are not representative of their respective source drainages.

Figure 9-1. El Cobre Soil, Stream and Rock Geochemistry - Gold

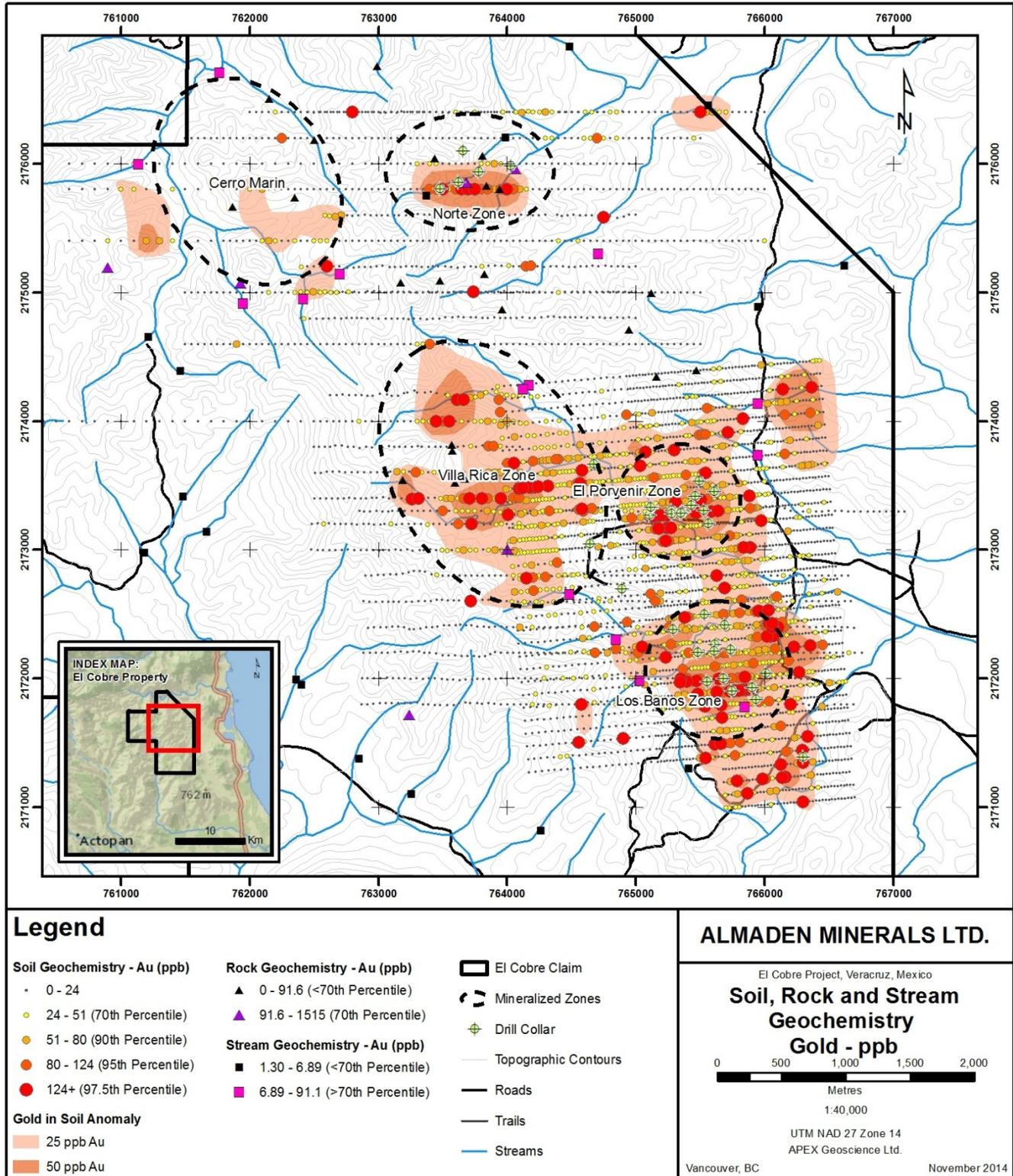
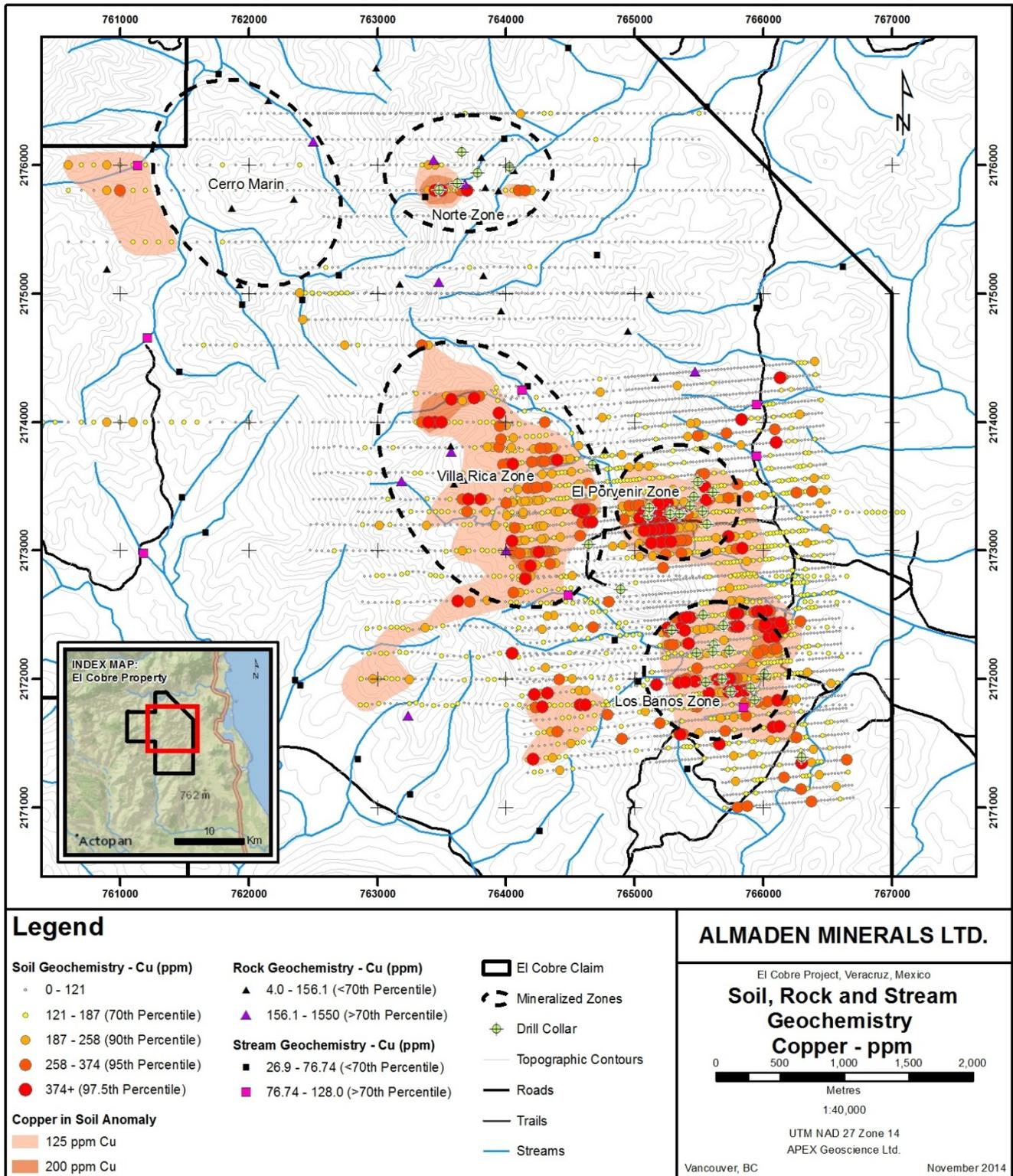


Figure 9-2. El Cobre Soil, Stream and Rock Geochemistry - Copper



Ten samples returned gold values greater than 10 ppb Au and six samples returned copper values greater than 100 ppm Cu. Most of these samples fall within previously defined zones of anomalous Cu-Au in soil, with isolated samples showing spot anomalies in the west and south of the Property (Figures 9-1 and 9-2).

#### 9.4 Geophysics

The El Cobre Property has been completely covered by two stages of airborne magnetics and radiometrics with a line spacing of 200 m. On the ground, conventional IP / resistivity, and magnetics were completed, covering the El Porvenir, Los Banos, Villa Rica, and Norte zones. In 2010, Condor Consulting Inc. (“Condor”) was retained by Almaden to process and assess selected airborne and ground geophysical data, focusing on a defined study area, then within the Caballo Blanco Project. The study area, known as the “Central Grid Zone”, lies within and covers the majority of the El Cobre Property. In 2011, Almaden commissioned a Titan-24 DCIP/MT survey at the Property, as a follow up to the previous geophysical work. A summary of the geophysical surveys completed at the Property is presented in Table 9-2.

Table 9-2. El Cobre Historical Geophysical Surveys

Year	Survey Type	Description
1997	Airborne	1,671 line-km magnetic, radiometric and FDEM survey (Caballo Blanco south, covering southern El Cobre)
2008	Airborne	1,240 line-km magnetic and radiometric survey (Caballo Blanco north, covering northern El Cobre)
1997 - 1998	Ground	80 line-km IP/resistivity and 60 line-km magnetometer surveys
2007 - 2010	Ground	77 line-km IP/resistivity and magnetometer surveys
2011 - 2012	Ground	Titan-24 DCIP and MT survey (35.8 line-km DCIP, 21.6 line-km MT)

##### 9.4.1 Airborne Magnetism / Radiometrics

In January 2008, the geophysics department of the Servicio Geologico de Mexico (SGM) completed a 1,240 line km helicopter-borne magnetic and radiometric survey over the northern half of the Caballo Blanco Property. The 2008 survey overlapped an earlier 1,671 line km airborne magnetic, radiometric and frequency domain electromagnetic (FDEM) survey completed by Aerodat (now Fugro) in 1997. The 1997 survey was flown over the southern half of the Caballo Blanco Property. Together, the surveys provide complete airborne magnetic and radiometric coverage of the Property at 200 m line spacing (Figure 9-3). In 2010, Condor merged and leveled the magnetic and radiometric datasets from the two airborne surveys. Select inverted cross sections of the airborne results are included in Figures 9-8 to 9-10.

Figure 9-3. El Cobre Airborne Magnetics

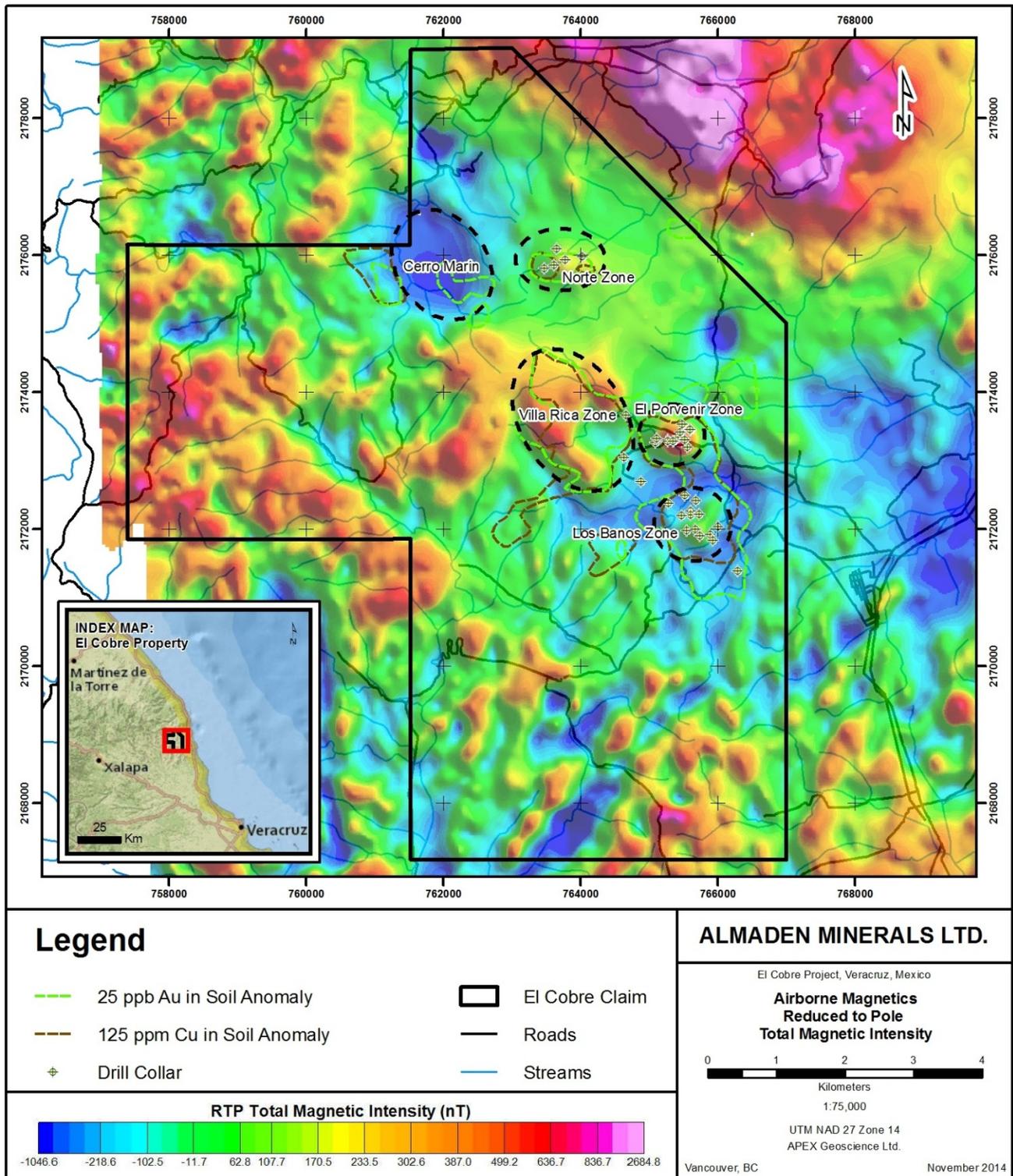
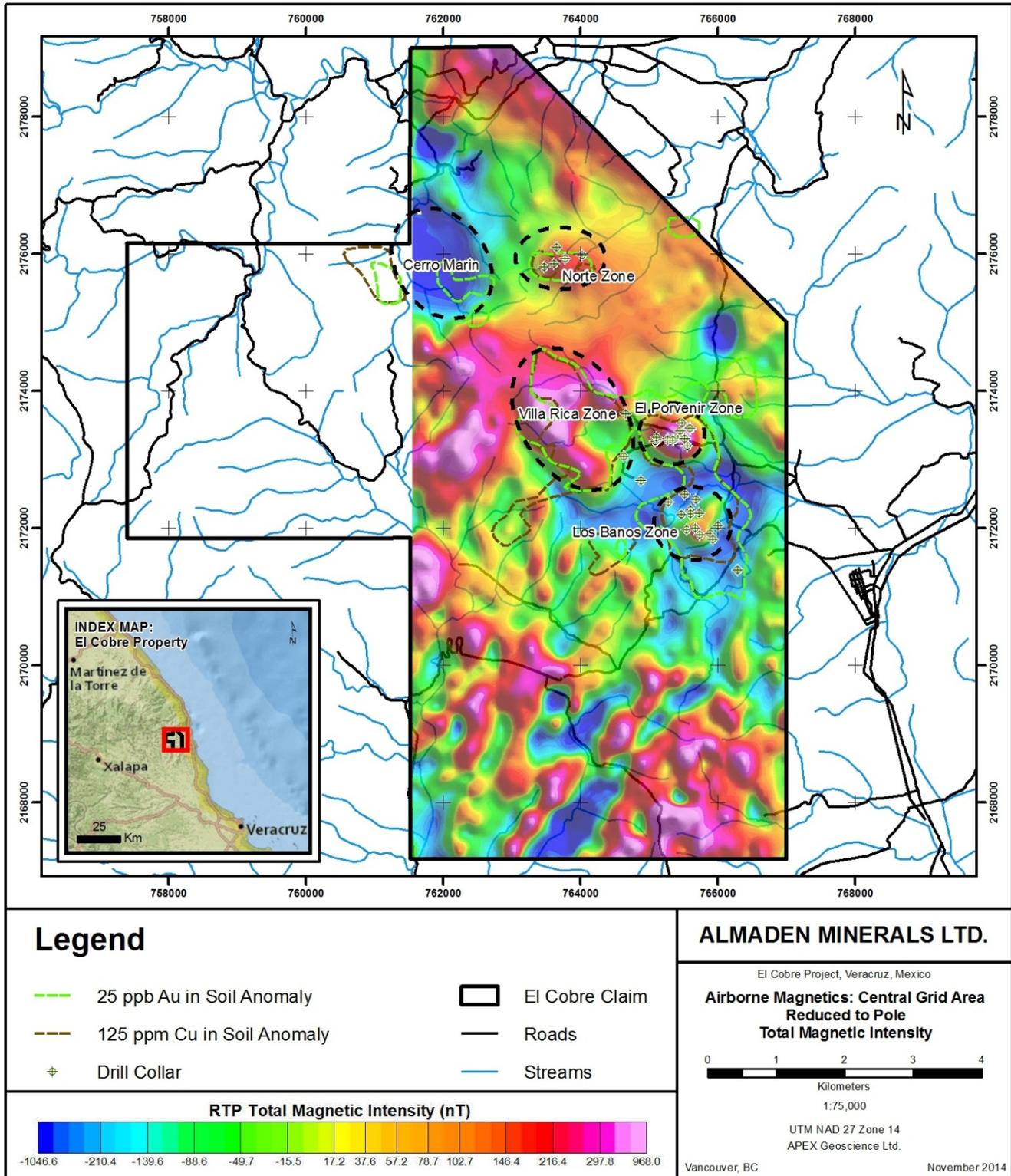


Figure 9-4. El Cobre Airborne Magnetics – Central Grid Zone



The airborne magnetic data confirms significant magnetic highs coincident with copper-gold soil anomalies at the El Porvenir, Los Banos, Villa Rica and Norte zones in the Central Grid area (Figure 9-4). 3D magnetic inversions suggest the potential for mineralization deeper than defined by current drilling in the El Porvenir, Los Banos and Norte zones. Several areas with coincident magnetic and geochemical anomalies remain untested by drilling, including the Villa Rica Zone. A magnetic low anomaly with a coincident weak to moderate gold-copper soil geochemical anomaly and deep IP conductivity response defines the Cerro Marin Zone. The magnetic low response is consistent with magnetite destruction related to the effects of late phyllic or argillic alteration within a porphyry system (Mitchinson et.al., 2013). This interpretation is supported by mapping completed by Almaden in 2014, which indicates that the Cerro Marin Zone is comprised of strongly quartz-kaolinite altered andesitic lava flows, with local propylitic alteration. Oxidized quartz veins were also noted within the target area.

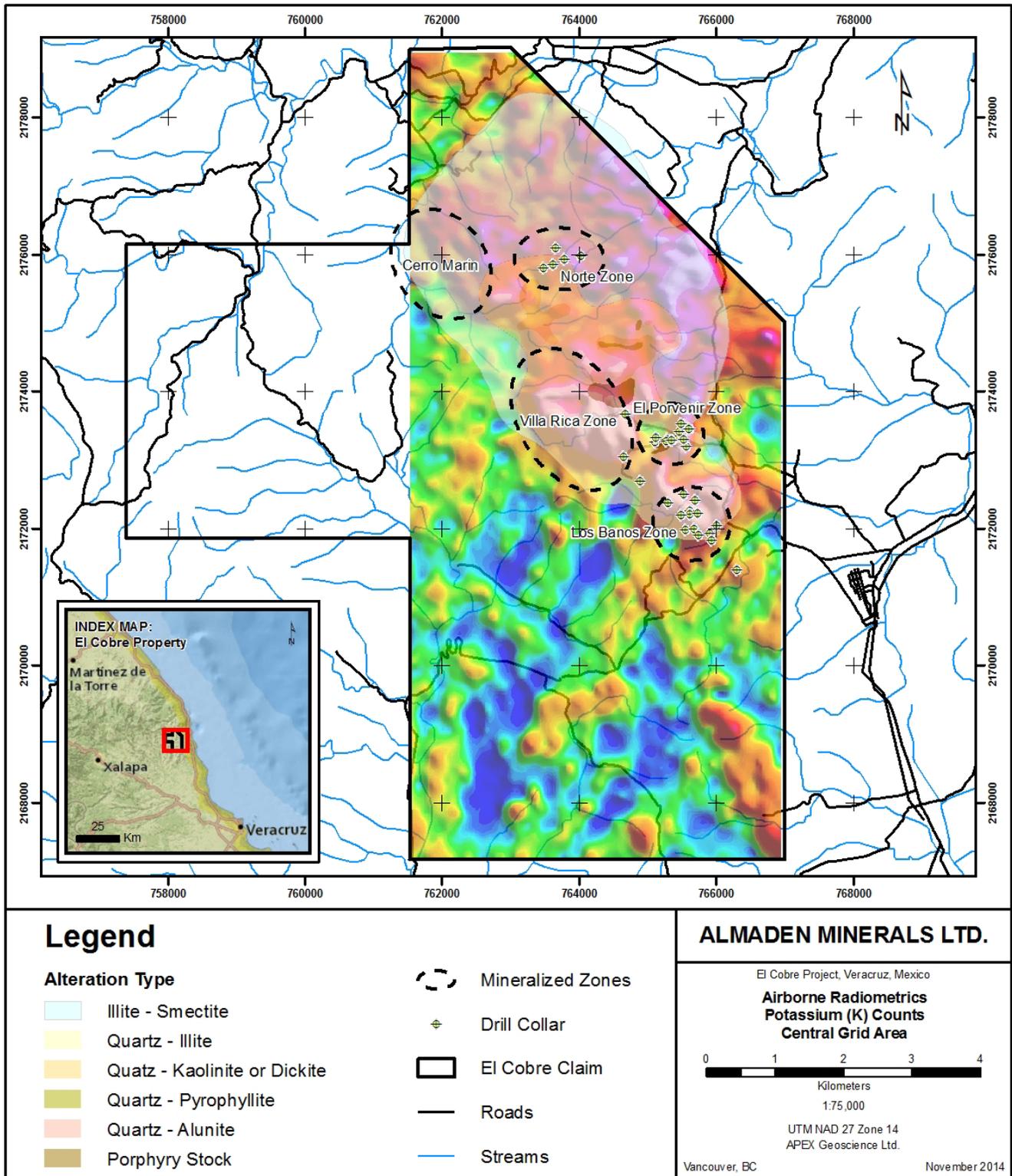
The merged radiometric data show elevated potassium (K), uranium (U) and thorium (Th) counts associated with hydrothermally altered volcanoclastic and dacitic rocks at El Cobre. Elevated potassium is commonly indicative of alteration within porphyry Cu-Au and epithermal Au systems due to the injection of K-rich hydrothermal fluids during mineralizing events. Because thorium is typically undisturbed by alteration processes, the K/Th ratio often provides a more sensitive indicator for potassium enrichment than K alone. However, due to the shallow penetration of radiometric methods, where surficial weathering has occurred K may be depleted relative to the less mobile Th and U ions (Dickson and Scott, 1997). This appears to be the case at El Cobre, where the K/Th ratio indicates relatively depleted potassium levels within a known porphyry and epithermal system. Potassium counts alone, however, show a significant correlation with the mapped geology, alteration and mineralized zones at El Cobre (Figure 9-5).

## 9.4.2 Ground Geophysics

### 9.4.2.1 Induced Polarization / Resistivity

During 2007 and 2008, Prospec MB Inc. ("Prospec MB"), geophysical contractor for Almaden, completed approximately 60.6 line-km of conventional IP / resistivity and ground magnetics within the El Cobre Property. A pole-dipole array was used with an "a" spacing of 50 m and "n" separations of 1 to 8. A ground magnetic survey was completed concurrently, with readings taken every 12.5 m. Twenty lines were completed, covering the El Porvenir, Villa Rica, and Norte zones. An additional four lines (16.6 line-km), covering the Los Banos Zone, were completed by Prospec MB in 2010.

Figure 9-5. El Cobre Airborne Radiometrics – Central Grid Zone



The inverted IP / resistivity data defined significant chargeability anomalies coincident with magnetic highs and multi-element soil geochemical anomalies at the El Porvenir, Los Banos, Villa Rica and Norte zones (Figure 9-6). Broad resistivity lows are also associated with the El Porvenir, Los Banos and Villa Rica zones (Figure 9-7). In contrast, the Norte Zone chargeability anomaly is considerably weaker than those seen in the other mineralized zones, and is associated with moderate to high resistivity. The Cerro Marin Zone exhibits a moderate conductivity high in the 400 m to 500 m depth slice models, however the anomalies may exceed the practical depth of investigation of the survey.

Resistivity data appears to vaguely reflect surficial geology and property scale northwest-southeast and northeast-southwest structural trends. Mapped alterations correlate reasonably well with the resistivity data. Areas of hydrothermal alunite-kaolinite-dickite-illite alteration surrounding the El Porvenir, Los Banos and Villa Rica zones are characterized by low resistivity, with resistivity highs occurring in peripheral areas. Elevated resistivity in the northern part of the survey block may also be related to a lithological change from volcanics in the south to dacitic rocks in the north. Similarly, a resistivity high on the west side of the survey block parallels the contact between intermediate to mafic flows in the west and altered volcanics to the east.

Contoured plan maps are plotted using inverted data at 200 metre depths for chargeability and resistivity in Figures 9-6 and 9-7, respectively. Select inverted cross sections of the IP / resistivity results are compiled in Figures 9-8 to 9-10.

#### 9.4.2.2 Titan-24 DCIP / MT

A Titan-24 DCIP / MT survey was completed by Quantec Geoscience Ltd. (“Quantec”) at the El Cobre Property between November 17, 2011 and January 12, 2012. DCIP data were collected over 10 lines with variable spacing, 300 m for the central area and up to 800 m in the north and south of the Property, using a pole-dipole array of 150 m dipole length. The MT data were acquired on 6 lines using the same dipole configuration and an orthogonal set of 100 m dipoles located at each other site. The Titan-24 survey was completed as a follow up to the previous IP / resistivity survey, in order to accurately detect potential porphyry Cu-Au mineralization targets at greater depths than conventional IP.

The Titan-24 DCIP survey identified a number of areas with high chargeability, typically occurring in coincidence with low resistivity. The results correlate well with results from the preceding conventional IP / resistivity survey. Coincident high chargeability / low resistivity anomalies are observed in the El Porvenir, Los Banos and Villa Rica zones. As with the conventional IP survey, a weaker chargeability response with moderate to high resistivity is observed in the Norte Zone (Figures 9-11 and 9-12). No significant chargeability anomaly appears at depth in this area.

Figure 9-6. El Cobre IP / Resistivity – 200 m Chargeability Depth Slice

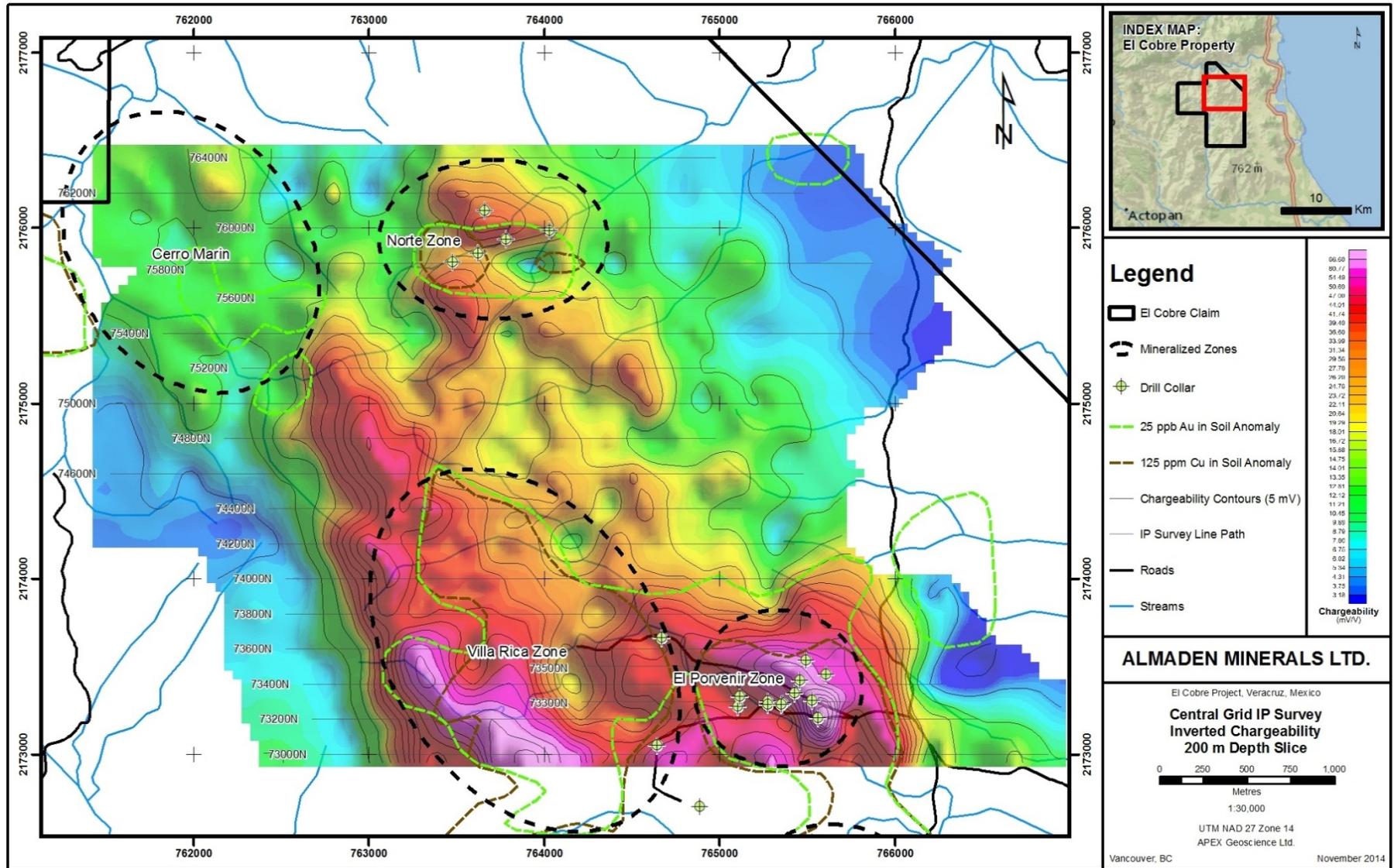


Figure 9-7. El Cobre IP / Resistivity – 200 m Resistivity Depth Slice

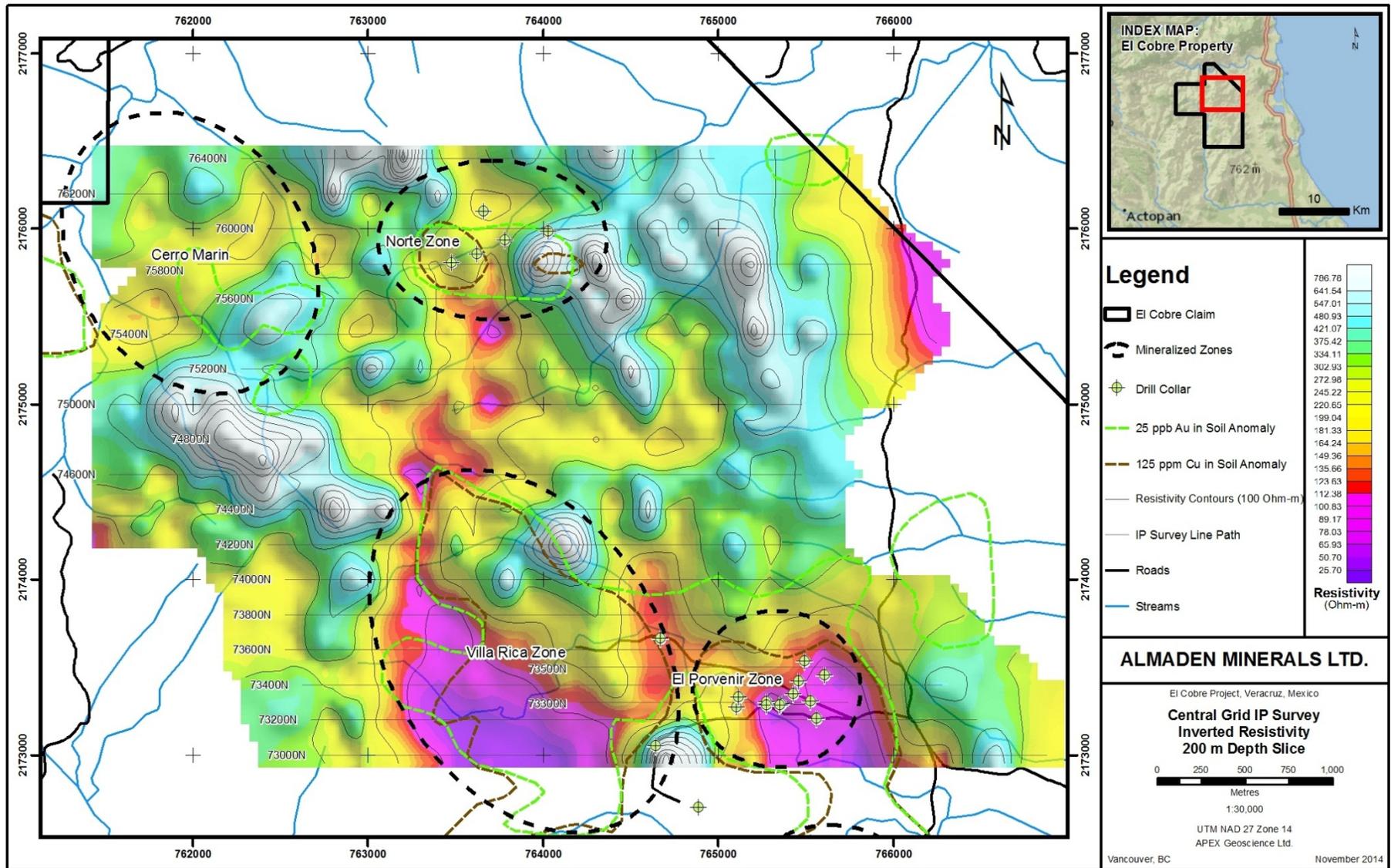


Figure 9-8. El Cobre Geophysics and Soil Samples – Los Banos Zone

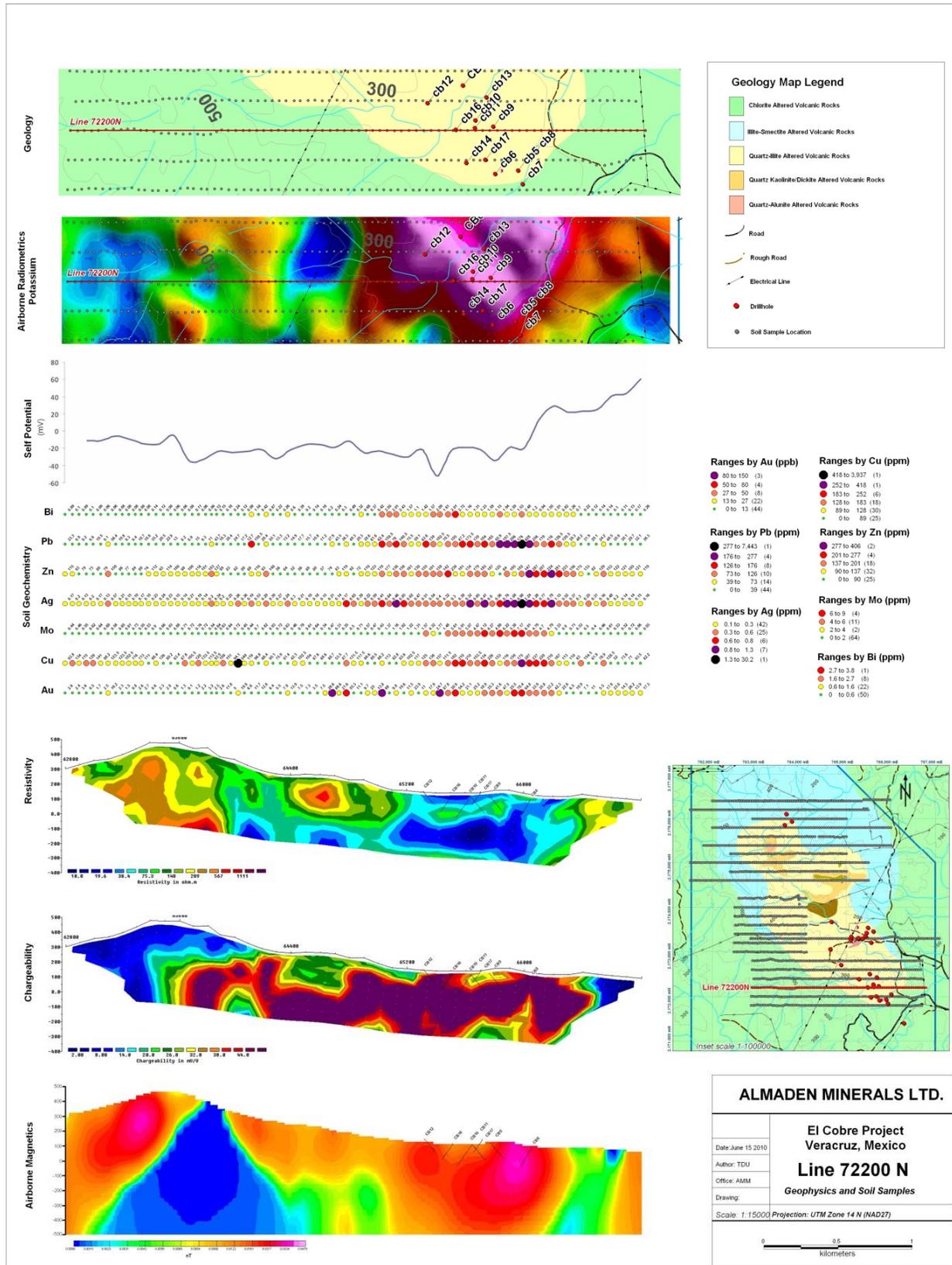


Figure 9-9. El Cobre Geophysics and Soil Samples – El Porvenir Zone

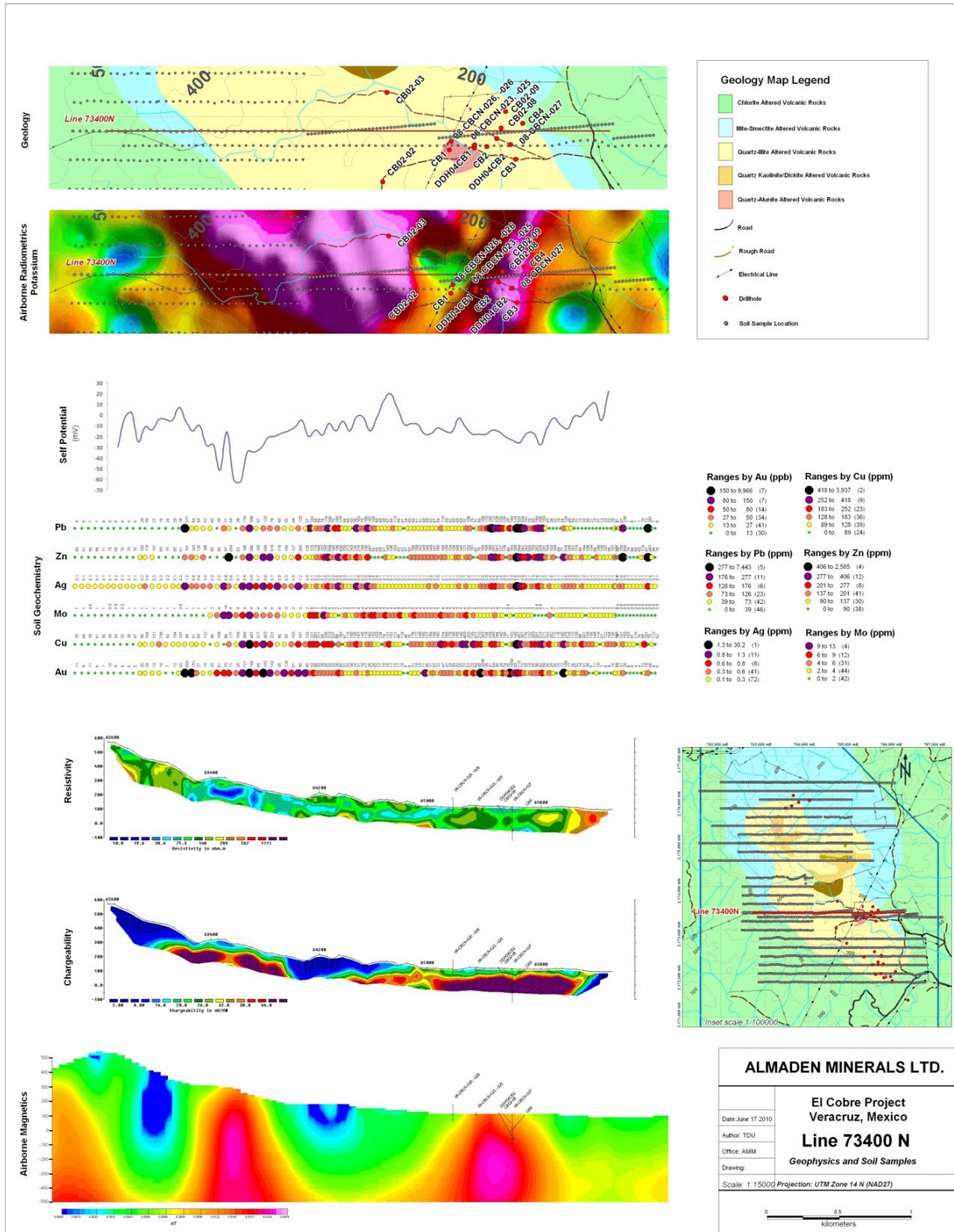
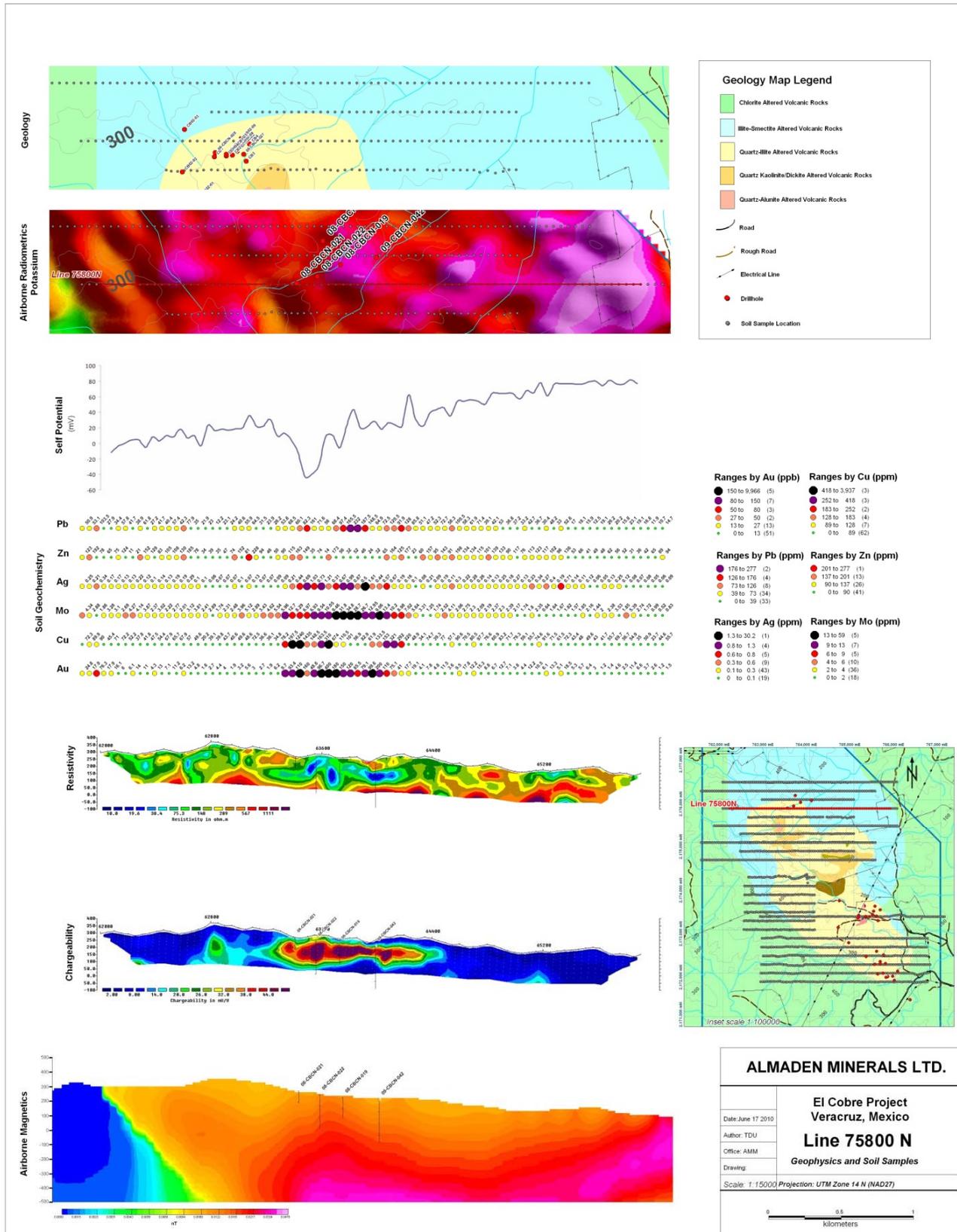


Figure 9-10. El Cobre Geophysics and Soil Samples – Norte Zone



3D inversions of the Titan-24 DCIP helped to further define the geometry and amplitude of the known anomalies at much greater depths. The Los Banos Zone is characterized by chargeabilities in excess of 80 milliradians (mrad) occurring in coincidence with or in close proximity to low resistivity areas below 30 ohm-m. The anomaly extends west from the Los Banos Zone, and northwest towards the Villa Rica Zone. It appears to be confined to relatively shallow depths, between the surface and -300 m A.S.L. The Villa Rica Zone is also relatively shallow, up to -400 m A.S.L., with chargeabilities in excess of 80 mrad and corresponding resistivity lows ranging from 30 to 100 ohm-m. The anomaly trends north-northwest, following a lithological boundary, suggesting the possibility of structural control on mineralization in the Villa Rica Zone.

The El Porvenir Zone chargeability anomaly defined in the preceding conventional IP / resistivity survey appears to be only a small surface expression of a much larger, deep-seated anomaly north of the Los Banos Zone and northeast of the Villa Rica Zone. As indicated in the 3D inverted elevation slices, the anomaly is generally situated at a much greater depth than the Los Banos, Villa Rica or Norte zones. The anomaly is defined by chargeabilities in excess of 90 mrad with resistivity responses ranging from 100 to 300 ohm-m. This type of response is consistent with a deep, high-sulphidation zone. The southern edge of this zone shows a sharp linear break in the chargeability trending northwest-southeast. This may indicate a possible structural contact between uplifted and down-dropped blocks on the south and north sides of the contact, respectively.

Together, the zones have been interpreted by Quantec to form a large, complex porphyry system with significant sulphidation and the possible inclusion of magnetic minerals (magnetite and pyrrhotite) associated with zones of high magnetic susceptibility. Contoured plan maps are plotted using 3D inverted Titan-24 data at 0 and -600 metre elevations for chargeability and resistivity in Figures 9-11 and 9-12, respectively. Select inverted cross sections of the Titan-24 DCIP results are compiled in Figures 9-13 to 9-15.

Figure 9-11. El Cobre Titan-24 Survey – Inverted Chargeability 0 m & -600 m ASL

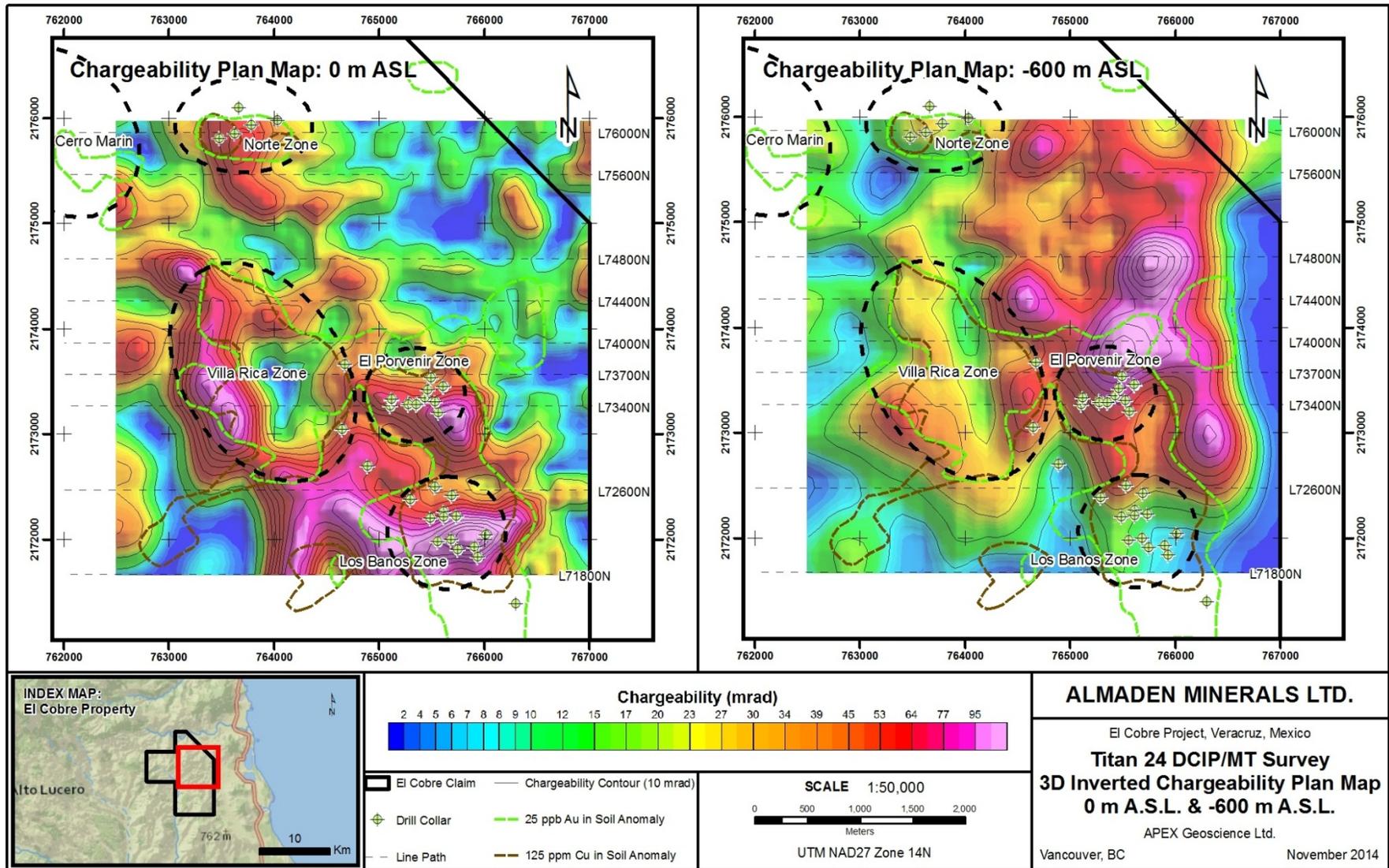


Figure 9-12. El Cobre Titan-24 Survey – Inverted Resistivity 0 m & -600 m ASL

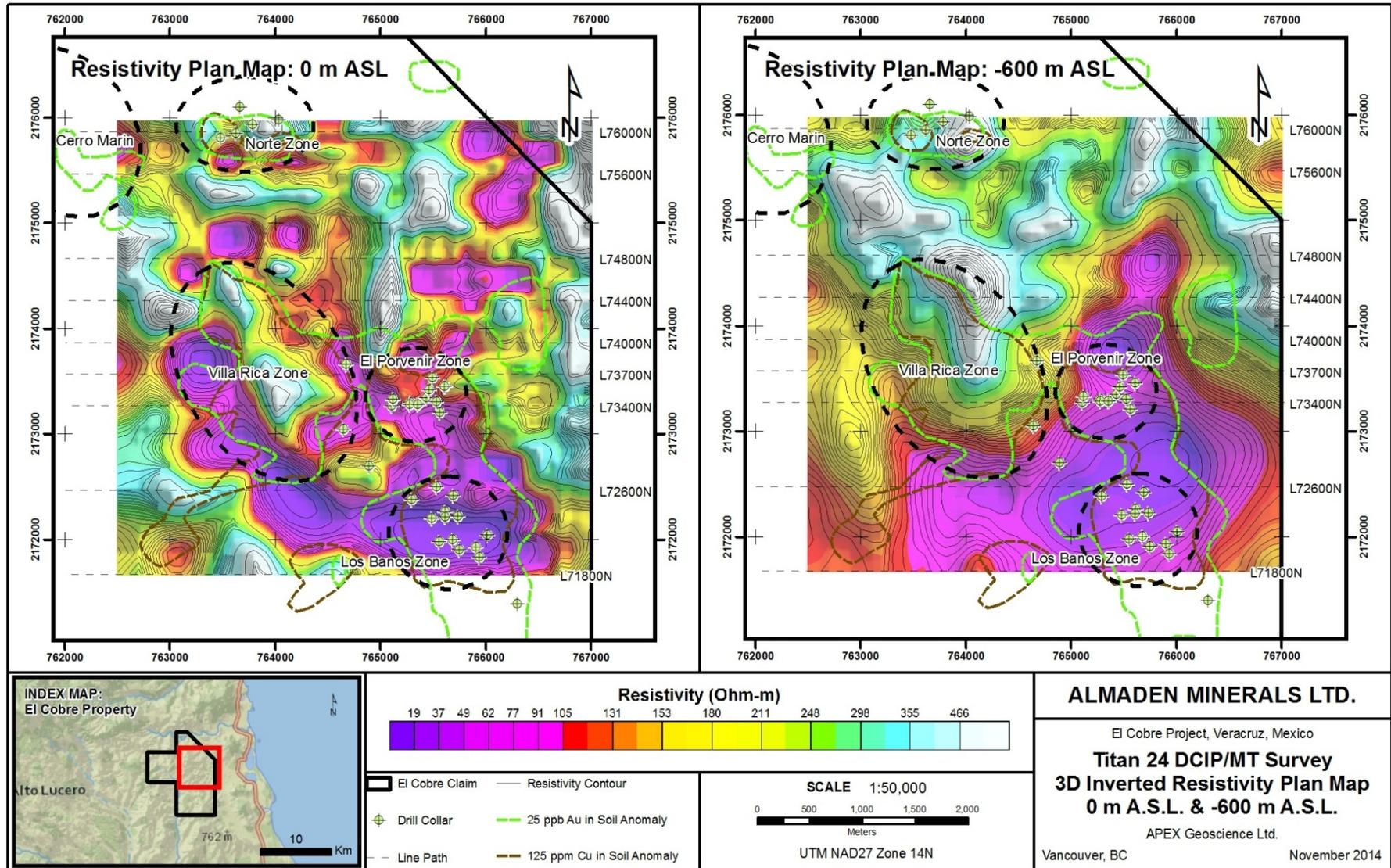
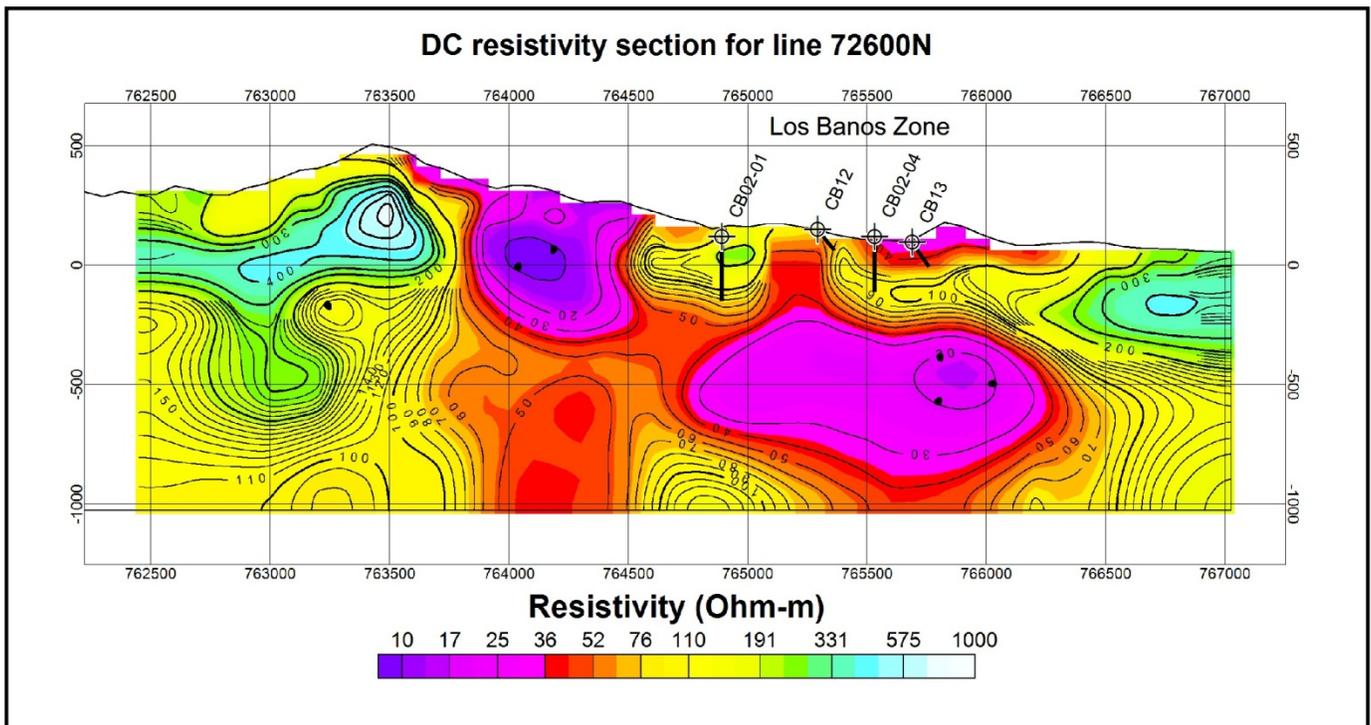
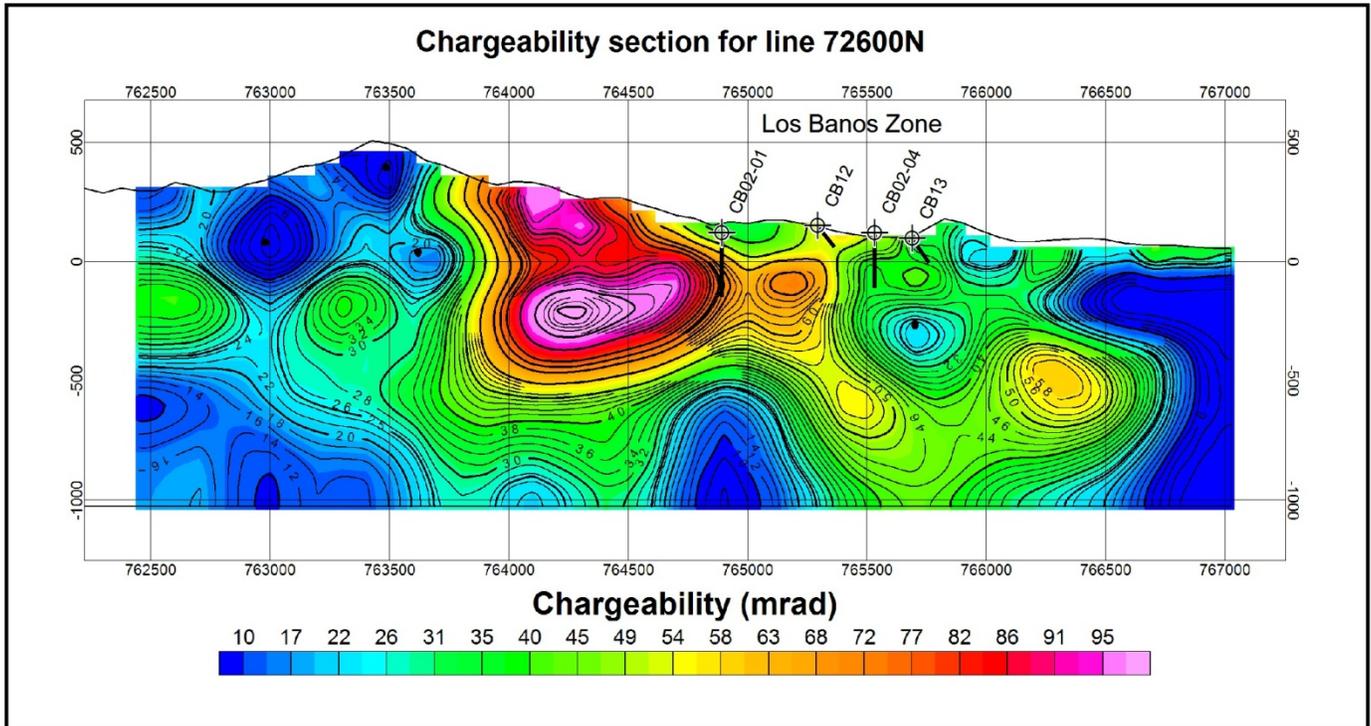
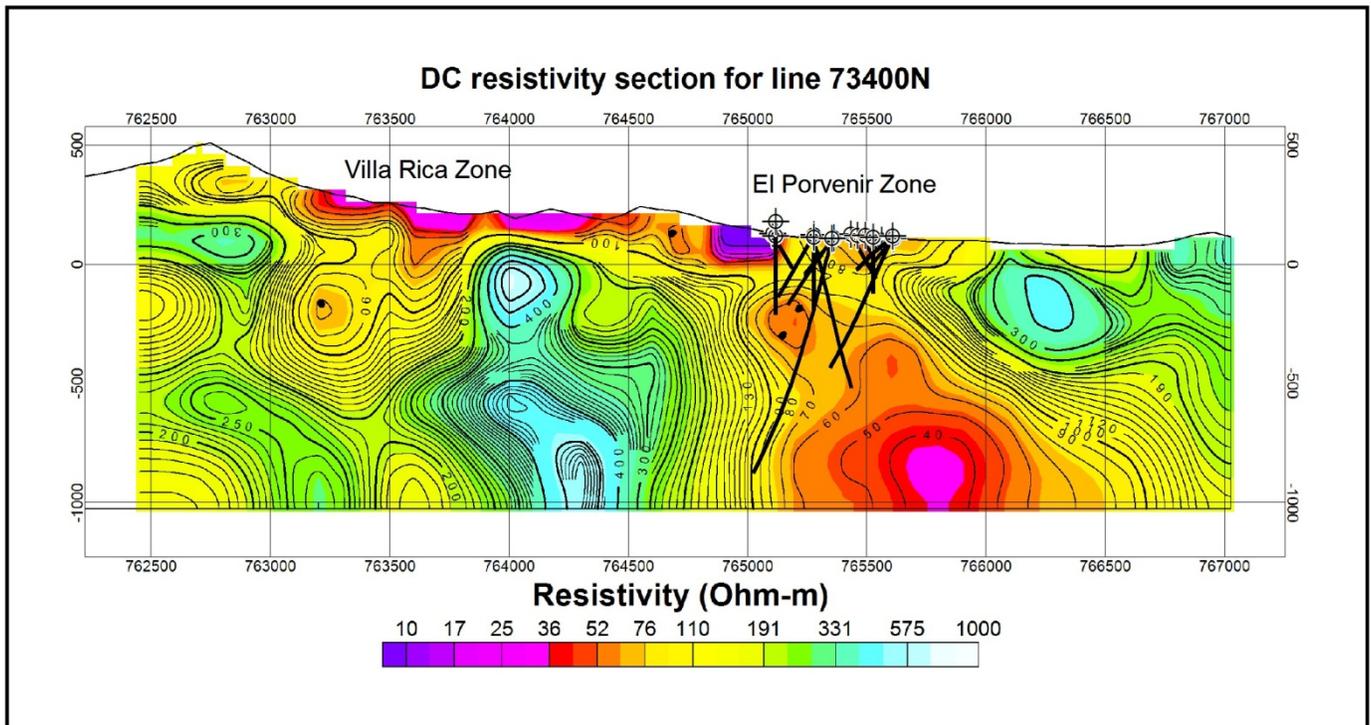
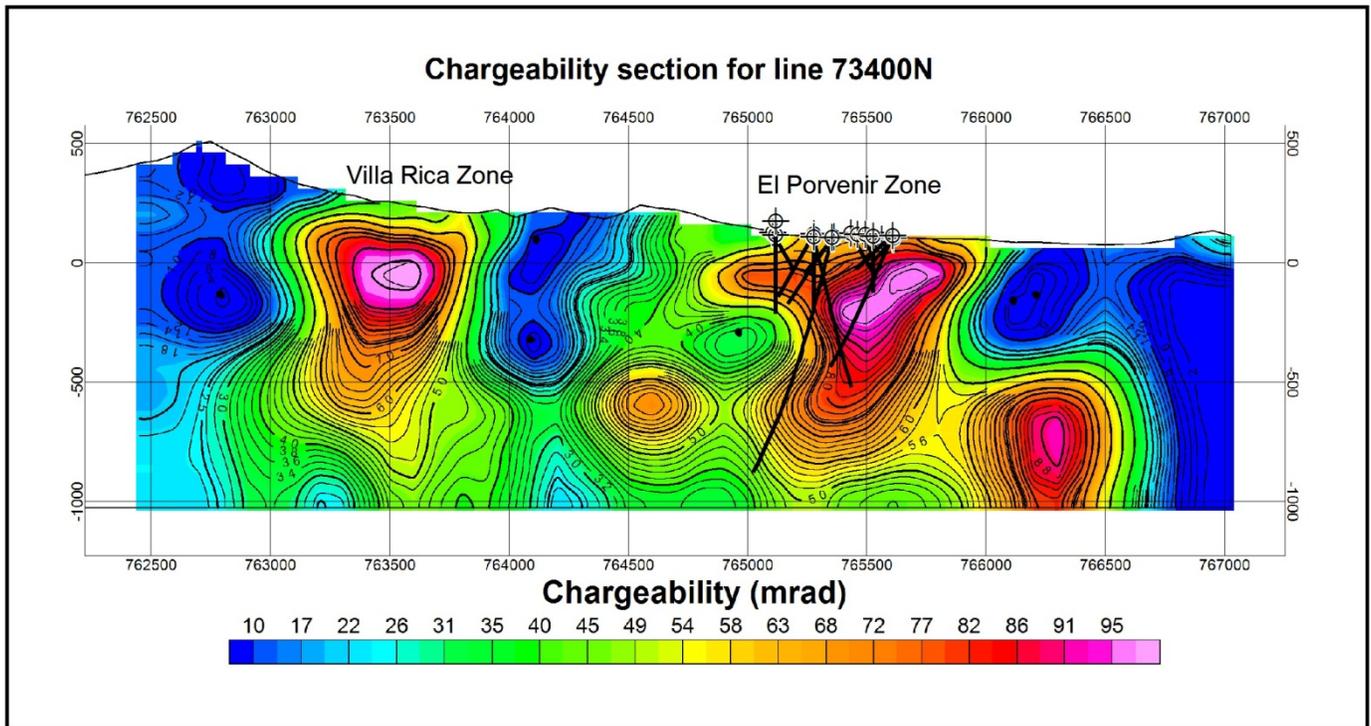


Figure 9-13. El Cobre Titan-24 DCIP Survey – Los Banos Zone



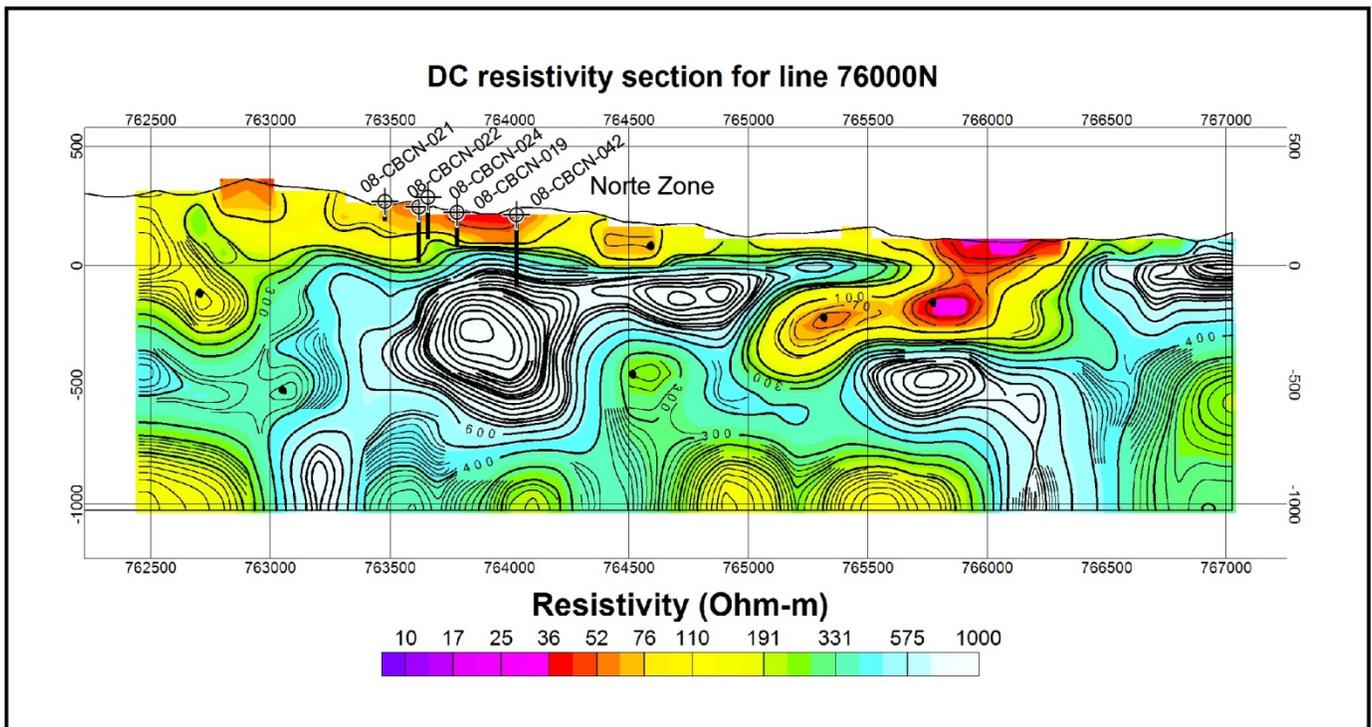
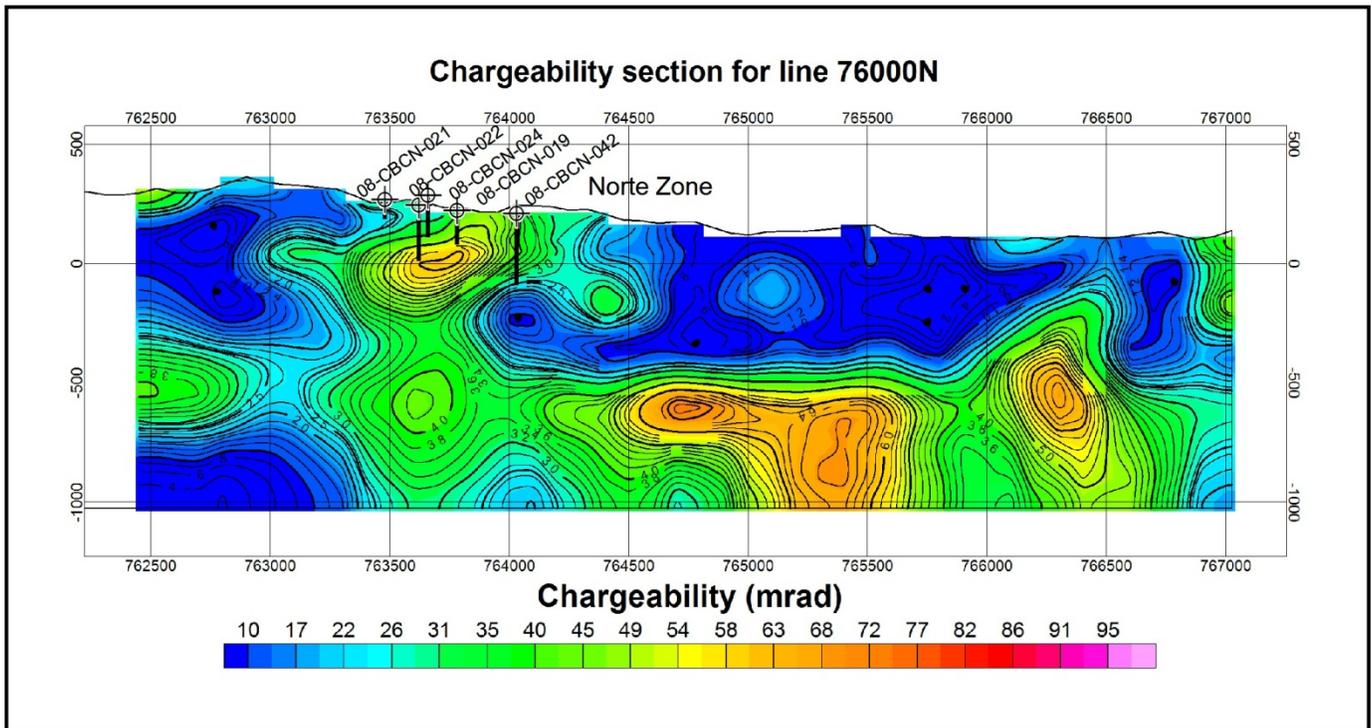
	<b>Legend</b> Drill Collar Drill Trace	Scale 1 : 30000	Window 500 metres	Plot Date 01-Nov-2014	<b>Line 72600N</b> Titan-24 Survey 3D Inverted Chargeability and Resistivity	<b>ALMADEN MINERALS LTD.</b>
		Line 72600N 				El Cobre Property Veracruz, Mexico

Figure 9-14. El Cobre Titan-24 DCIP Survey – El Porvenir Zone



	<b>Legend</b> Drill Collar Drill Trace	Scale 1 : 30000	Window 500 metres	Plot Date 01-Nov-2014	<b>Line 73400N</b> Titan-24 Survey 3D Inverted Chargeability and Resistivity	<b>ALMADEN MINERALS LTD.</b>
		Line 73400N 				El Cobre Property Veracruz, Mexico

Figure 9-15. El Cobre Titan-24 DCIP Survey – Norte Zone



	<b>Legend</b> Drill Collar Drill Trace	Scale 1 : 30000	Window 500 metres	Plot Date 01-Nov-2014	<b>Line 76000N</b> Titan-24 Survey 3D Inverted Chargeability and Resistivity	<b>ALMADEN MINERALS LTD.</b>
		Line 76000N 				El Cobre Property Veracruz, Mexico

## 10 Drilling

Seventeen reverse circulation (RC) drill holes, totalling 2,395 m, and twenty-three diamond drill holes (DDH), totalling 7,891 m, were completed at the El Cobre Property between 1998 and 2013. The drilling was completed under the supervision of Almaden (1998 RC; 2012 and 2013 core drilling) and various joint venture partners as described in Section 6 (History) of this Report including: Noranda (2002 core drilling), Comaplex (2004 core drilling) and, CGH (2009 and 2009 core drilling).

The 1998 RC holes CB1 and CB2 were the first to test the El Porvenir porphyry target. Copper-gold mineralization was intersected in both holes, associated with disseminated chalcopyrite and magnetite in the groundmass and as clots within the porphyry unit. In 2004, Comaplex diamond drilled hole DDH04CB1 at El Porvenir, extending the known mineralization to 300 m drill depth, and 2008 drilling by CGH further extended the mineralized zone at depth and to the south. Together with the previous drilling, these four holes define an apparently west dipping mineralized intrusive body at El Porvenir. Diamond drill hole EC-13-004, completed in 2013, targeted porphyry mineralization at depth beneath the 2008 holes, and intersected mineralization at downhole depths exceeding 600 m.

The Los Banos Zone, was tested by 13 shallowly dipping RC holes, totalling 1,733 m, drilled over a 1,200 m by 400 m northwest trend. Hole CB5 intersected altered feldspar porphyry, localized zones of silicification, quartz veining and fracture fill pyrite-chalcopyrite mineralization within two separate zones. The first zone starting at 18.29 m depth, averaged 0.12 % Cu, 1.63 g/t Au, and 27.5 g/t Ag over 15.24 m. The second zone averaged 0.12 % Cu and 0.47 g/t Au over 18.28 m, from a depth of 83.82 m depth, and was associated with light-grey altered porphyritic intrusive unit with localized quartz veining with up to 10 % pyrite and minor chalcopyrite along fractures. The remaining RC holes testing the Los Banos Zone define a broad area of anomalous gold mineralization near surface.

Five diamond drill holes tested the Norte Zone during the 2008-2009 drill programs over a strike length of approximately 500 m. All five holes intersected encouraging gold and copper values associated with altered porphyritic monzodiorite with intense quartz stockworks.

A summary of all drilling conducted on the Property is provided below. A list of significant drill intercepts is provided in Table 10-1. A drill plan map and cross sections for the Los Banos, El Porvenir and Norte Zones are provided in Figures 10-1 to 10-4. A complete list of collar information for the historic drilling is provided in Appendix 1.

The 1998 RC drill holes range from a minimum length of 99 m to a maximum of 194 m, and average 141 m. Downhole surveys were not completed and the azimuth and dip measured at surface is assumed for the entire borehole. Almaden collected samples at 5 foot (1.53 m) intervals down the length of the hole. Representative samples splits were obtained directly from the cyclone while drilling. Due to the nature of the RC drilling technique, which employs an open borehole through which drill cuttings pass before recovery at surface, there is a potential for sample contamination.

Contamination of relatively deeper samples may occur as they pass through and come in contact with zones of mineralization at shallower depths within the borehole. To minimize this possibility, upon the addition of each new 10 foot drill rod drill holes were “blasted” clean with compressed air prior to resumption of drilling and sampling. A review of the RC drill hole assays shows good downhole attenuation of mineralized zones for both gold and copper values (Figure 10-2 and 10-3). Based on this it appears that RC sample contamination below mineralized zones is not significant. The RC samples are therefore considered to be representative.

The 2002 through 2013 diamond drill holes range from a minimum length of 73 m to a maximum of 1,050 m, and average 343 m. Core diameter was variable ranging from NQ (4.76 cm diameter) in 2004, 2012 and 2013 to NTW (5.62 cm diameter) in 2008. Drill hole collars were spotted using a handheld GPS and compass. Each of the holes is marked with a small cement cairn inscribed with the drill hole number and drilling direction. It is not known whether Noranda completed down hole surveys during the 2002 drill program. It is reported that downhole surveys data was collected during the 2004, and 2008 and 2009 drill programs (Barham and Noel, 2005; and Teliz et al., 2008), however the survey data is not available. Diamond drill holes completed by Almaden during 2012 and 2013 were surveyed using a Reflex EX-Shot instrument at intervals of 50 m following the completion of each hole.

At the rig, drill core was placed in plastic core boxes labeled with the drill hole number, box number, and an arrow to mark the start of the tray and the down hole direction. Wooden core blocks were placed at the end of each core run (usually 3 m, or less in broken ground). At the end of each shift drill core is transported to Almaden’s Tinajitas core logging, sampling and warehouse facility. Drill core was logged based on lithology, and the presence epithermal alteration and mineralization. Geotechnical logging comprised measurements of total core recovery per-run, RQD.

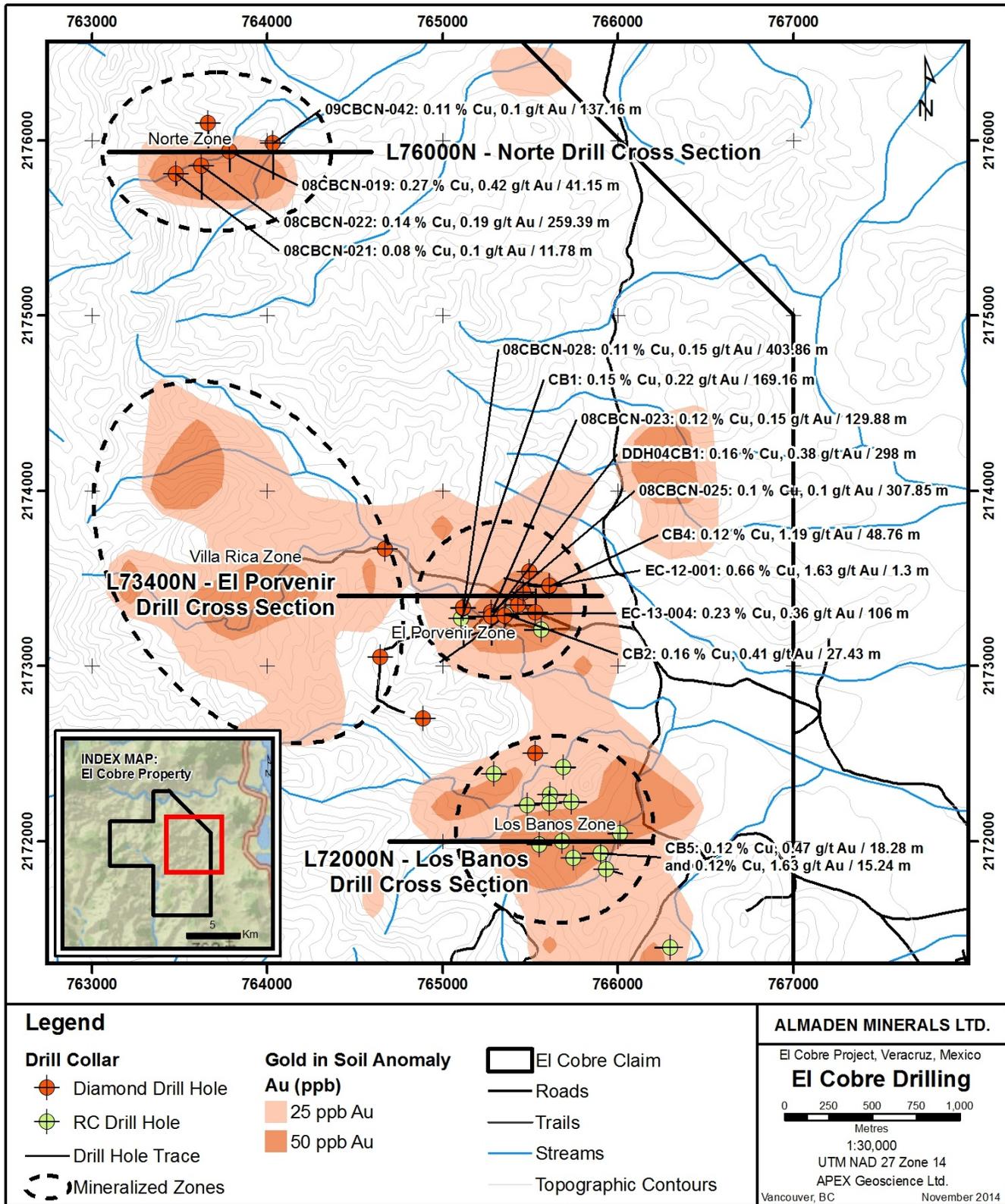
All strongly altered or epithermal-mineralized intervals of core were sampled. The drill core sample interval during the 2002 Noranda drilling ranged from 1 to 4 m with the majority of samples being 2 or 3 m in length. During the 2008 and 2009 drilling CGH employed a maximum sample length of 3.05 m or less. During 2012 and 2013, Almaden employed a maximum sample length of 2 to 3 m in unmineralized lithologies, and a maximum sample length of 1 m in mineralized lithologies (50 cm minimum sample length). Sampling always began at least 5 samples above the start of mineralization. Geological changes in the core such as major alteration or mineralization intensity (including large discrete veins), or lithology were used as sample breaks.

There are no other drilling, sampling or recovery factors that could materially impact the accuracy and reliability of the drill results. The relationship between sample length and the true thickness of the mineralization summarized below is unknown. Additional information with respect to RC and diamond drilling procedures can be found in the Section 11 (Sample Preparation, Analyses and Security) of this Report.

Table 10-1. El Cobre 1998-2013 Significant Drill Hole Intercepts

Drill Hole	Zone	From (m)	To (m)	Length (m)	Cu %	Au (g/t)
CB1	El Porvenir	0.00	169.16	<b>169.16</b>	<b>0.15</b>	<b>0.22</b>
CB2	El Porvenir	153.92	181.35	27.43	0.16	0.41
CB4	El Porvenir	96.01	144.77	48.76	0.12	1.19
CB4 (including)	El Porvenir	96.01	108.20	<b>12.19</b>	<b>0.37</b>	<b>3.83</b>
CB5	Los Banos	18.29	33.53	15.24	0.12	1.63
CB5	Los Banos	83.82	102.10	18.28	0.12	0.47
CB6	Los Banos	33.53	102.10	68.57	0.05	0.21
CB6 (including)	Los Banos	39.62	48.77	9.15	0.10	0.47
CB7	Los Banos	0.00	109.72	109.72	0.04	0.12
CB13	Los Banos	65.53	123.44	57.91	0.05	0.33
CB15	Los Banos	35.05	57.91	22.86	0.05	0.38
CB17	Los Banos	1.52	76.20	74.68	0.07	0.27
DDH04CB1	El Porvenir	2	300	<b>298</b>	<b>0.16</b>	<b>0.38</b>
08-CBCN-019	Norte	9.14	100.58	91.44	0.08	0.13
08-CBCN-019 (including)	Norte	146.30	187.45	<b>41.15</b>	<b>0.27</b>	<b>0.42</b>
08-CBCN-021	Norte	80.77	92.55	11.78	0.08	0.10
08-CBCN-022	Norte	44.80	304.19	<b>259.39</b>	<b>0.14</b>	<b>0.19</b>
08-CBCN-022	Norte	248.10	281.33	33.23	0.21	0.21
08-CBCN-022 (including)	Norte	132.89	187.60	<b>54.71</b>	<b>0.20</b>	<b>0.30</b>
08-CBCN-023	El Porvenir	1.18	131.06	129.88	0.12	0.15
08-CBCN-024	Norte	56.38	89.91	33.53	0.02	0.46
08-CBCN-025	El Porvenir	10.66	318.51	<b>307.85</b>	<b>0.10</b>	<b>0.10</b>
08-CBCN-026	El Porvenir	24.38	335.28	<b>310.90</b>	<b>0.11</b>	<b>0.17</b>
08-CBCN-027	El Porvenir	91.44	272.8	181.36	0.08	0.10
08-CBCN-027 (including)	El Porvenir	91.44	115.82	24.38	0.18	0.16
08-CBCN-028	El Porvenir	0.00	403.86	<b>403.86</b>	<b>0.11</b>	<b>0.15</b>
09CBCN-042	Norte	224.64	361.8	137.16	0.11	0.10
EC-12-001	El Porvenir	69.7	71.0	1.3	0.66	1.63
EC-13-004	El Porvenir	398	643	<b>245</b>	<b>0.18</b>	<b>0.25</b>
EC-13-004 (including)	El Porvenir	424	456	<b>32</b>	<b>0.41</b>	<b>0.82</b>

Figure 10-1. El Cobre Drill Plan



## 10.1 El Porvenir and Los Banos

### *10.1.1 1998 Reverse Circulation (RC) Drilling*

The 1998 work included 17 RC drill holes, totalling 2,395 m, that tested soil geochemical and IP geophysical anomalies spatially associated with mineralized float and outcrop.

Holes CB1 and CB2 tested the El Porvenir Zone, targeting porphyry style K-silicate altered mineralized outcrop. Hole CB1 was drilled to the east at a -60° dip, and intersected 0.15% Cu and 0.22 g/t Au over 169.16 m, the entire length of the hole. Hole CB2 was drilled to the west at -50°, and intersected 0.16% Cu and 0.41 g/t Au over 27.43 metres. Significant intervals of monzodiorite were intersected in both holes, with chalcopyrite disseminations observed throughout. Earlier K-silicate alteration was cross-cut and overprinted by intense illite-pyrite alteration. Higher Cu-Au grades appear to be associated with intense sericite-pyrite alteration. Sections with 10-20% pyrite were intersected in both holes associated with clay-quartz-pyrite altered sections.

Hole CB4, was collared 300 m northeast of CB2, and intersected a significant zone of quartz veining and illite-quartz-pyrite alteration in host andesite. Assay highlights include 0.12% Cu, and 1.19 g/t Au over 48.76 m, including 0.37% Cu, 3.83 g/t Au, and 22.5 g/t Ag over 12.2 m. The mineralized zones are associated with vuggy quartz veins and veinlets, with local concentrations of up to 30% pyrite and 1% chalcopyrite, with associated galena and sphalerite, hosted within a grey clay-quartz altered volcanic rock.

Hole CB5 targeted a chargeability high and breccia zone interpreted to represent a hydrothermal eruption breccia pipe within the Los Banos Zone. The hole was drilled to the west at -50°, and intersected a highly altered feldspar porphyry intruding andesite. Zones of silicification are associated with dark, undulating quartz veins that contain pyrite and rarely chalcopyrite. CB5 intersected two zones of mineralization separated by 50 m. Starting from 18.29 m depth, 0.12% Cu, 1.63 g/t Au, and 27.5 g/t Ag was intersected over 15.24 m, which was associated with heavy clay-quartz alteration and quartz veining. Starting from 83.82 m depth, 0.12% Cu and 0.47 g/t Au was intersected over 18.28 m, which was associated with light-grey altered porphyritic intrusive unit with localized quartz veining with up to 10% pyrite and minor chalcopyrite along fractures.

The remaining RC holes testing the Los Banos Zone typically intersected altered andesite. Together these holes define a broad area of anomalous near surface gold mineralization (Table 10-1 and Figure 10-2).

### *10.1.2 2002 Diamond Drilling*

In 2002, Noranda drilled four NQ-sized diamond drill holes, totalling 1,145 m. The holes ranged from 231 to 343 m in depth and were drilled vertically. The four holes were collared in areas peripheral to the El Porvenir Zone, and do not coincide with any known geophysical or geochemical anomalies. Pervasive potassic alteration was encountered but no significant mineralization was reported.

Two additional holes, totalling 163 m, were drilled by Almaden in 2002, collared adjacent to RC hole CB4. Hole CB-02-08 was drilled to the east at -50° dip, parallel to and about 30 m south of hole CB4. It intersected fault gouge in the area where the vein was expected. Hole CB-02-09 was located 90 m north of CB4 and also aimed east at -50°. This hole intersected a mineralized vein zone from 57.3 to 60.0 m and from 69.0 m to 73.0 m; the recovered material contained fragments of chalcopyrite-galena-pyrite mineralized quartz vein material. The hole was lost in bad ground at 73 m. No samples were collected from these holes.

#### *10.1.3 2004 Diamond Drilling (modified from Barham and Noel, 2005)*

Two NQ-sized diamond drill holes, totalling 516.03 m, were completed at the El Porvenir Zone in 2004. Hole DDH04CB1, collared 170 m to the west of CB1, was drilled to the west at an inclination of -60°. The hole collared in light green-grey and light grey-brown porphyritic monzonite. From 52.5 m, non-porphyritic monzonite was logged, with pyrite and chalcopyrite content increasing gradually towards the end of hole. Over the entire length of the hole, DDH04CB1 graded 0.16% Cu and 0.38 g/t Au over 298 m. Hole DDH04CB2 was drilled east with a dip of -60°, to a depth of 216 m. Up to 3% pyrite was observed as fracture fillings and disseminations throughout the hole. Although quartz veining was the target, very little veining was intersected. Very minor druzy quartz-calcite ± pyrite veins were encountered at 64.0 m and at 70.5 m. Gold appears slightly anomalous in these zones, but no significant assay results were reported.

#### *10.1.4 2008 Diamond Drilling*

In 2008, CGH drilled five (5) BQ-sized diamond drill holes, totaling 1640.21 m at the El Porvenir target to extend the mineralization and porphyry zones intersected in the 1998 and 2004 drill programs.

Four holes were drilled from two set ups, separated by 165 m, along the same east-west line. Drill holes 08-CBCN-026 and 08-CBCN-028 were set up 60 m north of hole CB1. Both holes were drilled south, at -50° and -75° dips, respectively. Hole 08-CBCN-026 intersected 0.11% Cu and 0.17 g/t Au over 310.9 m and hole 08-CBCN-028 intersected 0.11% Cu and 0.15 g/t Au over 403.86 m, the entire length of the hole. Drill holes 08-CBCN-023 and 08-CBCN-025 were set up to test and extend the mineralization zone intersected in DDH04CB1. Both holes were drilled south, at -50° and -75°, dips respectively. Hole 08-CBCN-023 intersected 0.12% Cu and 0.15 g/t Au over 129.88 m and hole 08-CBCN-025 intersected 0.10% Cu and 0.10 g/t Au over 307.85 m. Mineralization was consistently associated with intensely altered monzodiorite.

Drill hole 08-CBCN-027, was set up 170 m southwest of hole CB4 and 160 m east of CB2. The purpose of this hole was to test the extent of mineralization to the north of the set up. Drilling north at -60° dip, it intersected 0.08% Cu and 0.10 g/t Au over 181.36 m, including 0.18% Cu and 0.16 g/t Au over 24.38 m. Unlike the other four holes, 08-CBCN-027 did not intersect wide zones of monzodiorite porphyry; the style of mineralization appears to be consistent with the higher level epithermal deposit, similar to the zone intersected in CB4.

### *10.1.5 2012 – 2013 Diamond Drilling*

A total of 5 holes, totalling 3,229 m, were drilled by Almaden during 2012 and 2013. Drilling comprised a series of deep holes drilled at steep inclinations designed to test the El Porvenir Zone at depths far beyond that of previous drilling.

Three holes targeted the main porphyry zone at El Porvenir. Drill holes EC-13-004 and EC-13-005 were set up at the same location used for CB2, drilling southwest at -50° and -72° dips respectively. Drill hole EC-13-004 intersected 0.23% Cu and 0.36 g/t Au over 106 m, including 0.41% Cu and 0.82 g/t Au over 32 m. Hole EC-13-005 intersected intensely phyllic-altered and pyrite mineralized monzonite intrusives with minor copper and gold. Hole EC-13-005 is interpreted to have terminated too shallow to intersect the significant copper-gold zone seen in EC-13-004. EC-12-003 was collared at the same location as DDH04CB1 drilling east at -75° dip. The purpose was to test the porphyry style mineralization extent at depth and to the east, and as an infill between DDH04CB1 and CB2, but no significant mineralization was intersected.

Drill holes EC-12-001 and EC-12-002, were collared at the same spot as 1998 RC drill hole CB4. The two holes sandwiched CB4, drilling to the west at -40° and -65° dips respectively. Drill hole EC-12-001 intersected 0.66% Cu, 1.63 g/t Au, and 84.12 g/t Ag over 1.3 m, associated with a quartz vein within an andesite tuff unit. Drill hole EC-12-002 did not intersect significant mineralization.

### 10.2 Norte Zone

In 2008 and 2009, CGH drilled five BQ-sized diamond drill holes, totaling 1196.93 m at the Norte Zone. These holes were designed to test significant geochemical and geophysical anomalies identified during the 2007 and 2008 exploration programs.

Four holes were drilled in 2008 over a 375 m, E-W distance to test a significant Cu-Au-Mo soil anomaly coincident with chargeability and magnetic highs. All holes were drilled to the south at -50° dip. Encouraging gold and copper values were intersected in all four holes, including hole 08-CBCN-019, which intersected 0.27% Cu, and 0.42 g/t Au over 41.15 m.

In 2009, hole 09-CBCN-042, collared 230 m west of 08-CBCN-019, tested the eastern extension of the Norte Zone. This hole was drilled south at -55° dip, and intersected 0.11% Cu and 0.10 g/t Au over 137.16 m.

Mineralization at the Norte Zone is associated with intensely altered diorite with intense quartz stockwork. The Norte Zone target remains open to further drill testing.

Figure 10-2. Los Banos Zone Drill Cross Section

Los Banos Zone Drill Cross Section - L72000N facing North

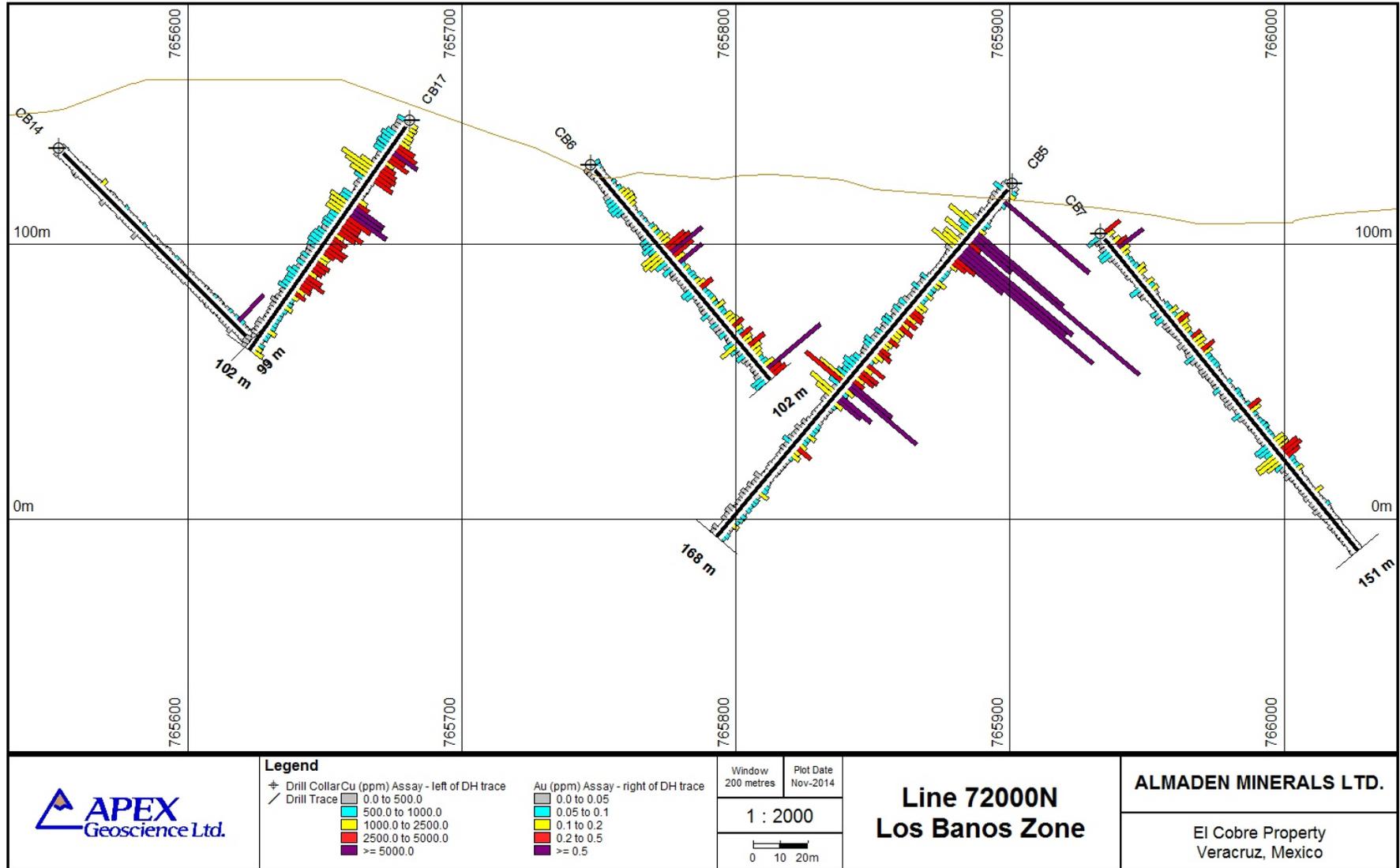


Figure 10-3. El Porvenir Drill Cross Section

### El Porvenir Drill Cross Section - 73400N facing North

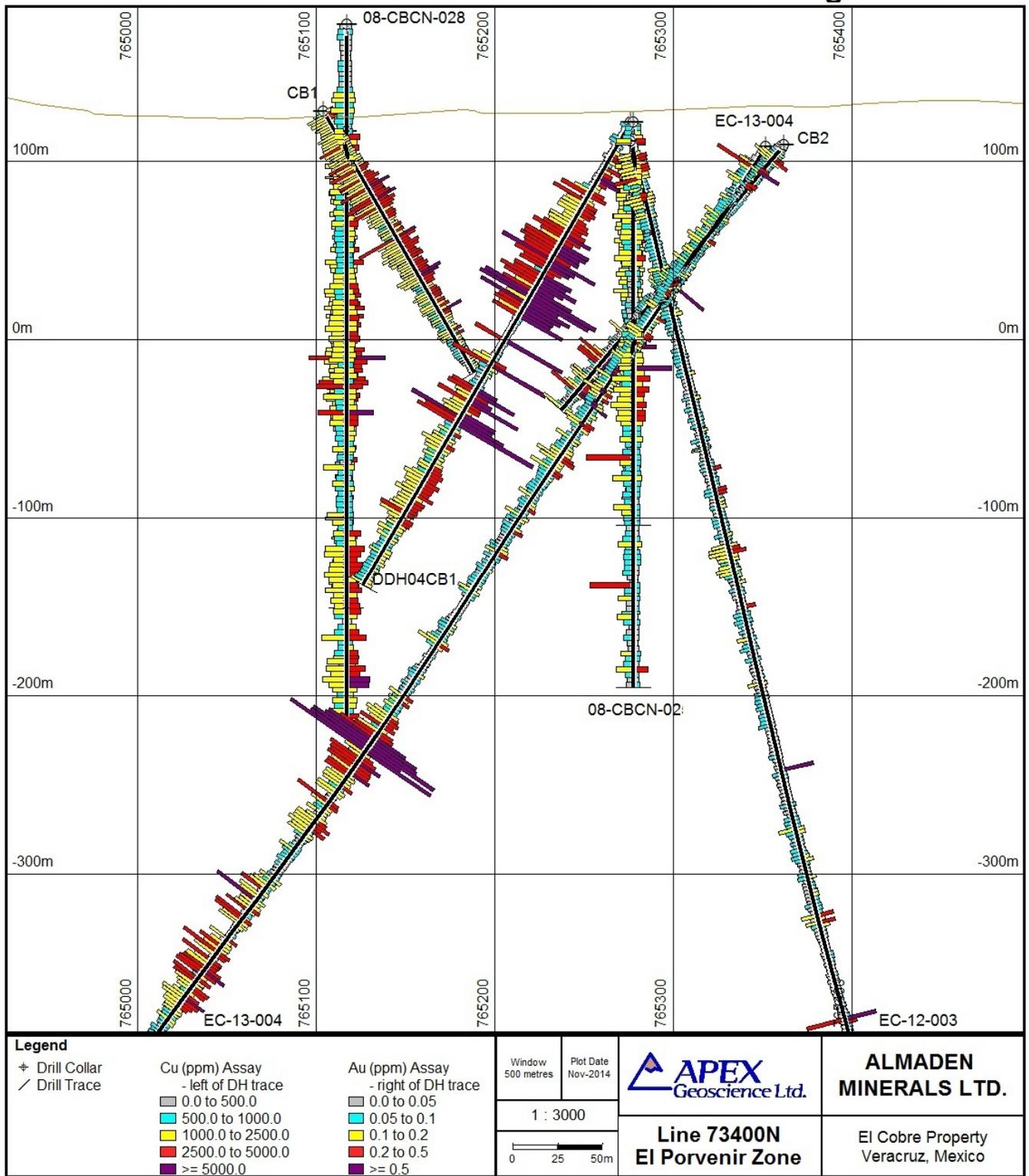
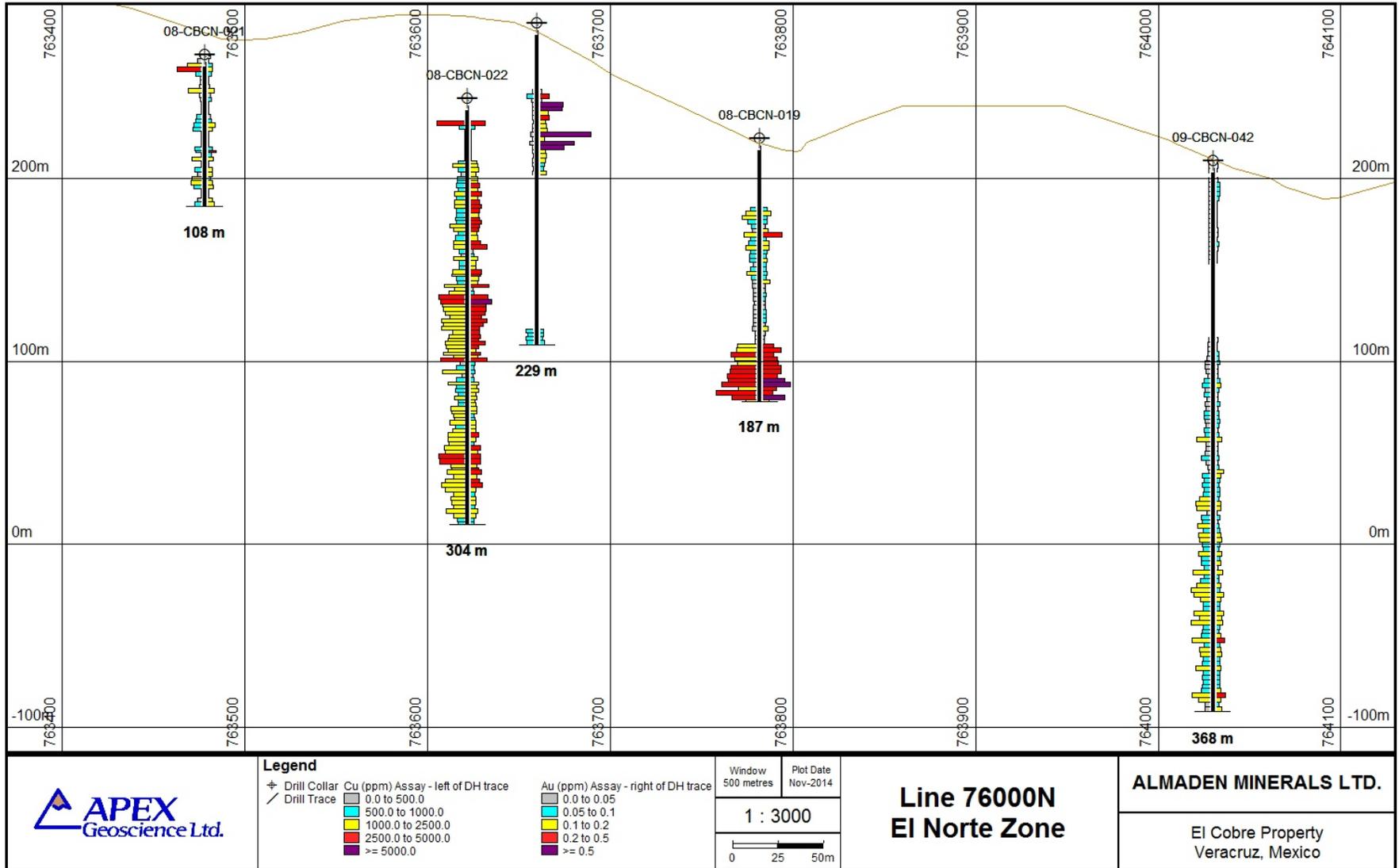


Figure 10-4. Norte Zone Drill Cross Section

**Norte Zone Drill Cross Section - L7600N facing North**



## 11 Sample Preparation, Analyses and Security

### 11.1 Sample Preparation and Analyses

#### 11.1.1 Rock Grab, Soil and Silt Geochemical Samples

Rock grab, soil and silt geochemical samples were transported by Almaden or CGH personnel from the field to the secure Tinajitas village core facility, located 2 km east of the Property. In preparation for shipping, samples were placed into plastic twine (rice) sacks and sealed using locking plastic cable ties.

The 1998 soil samples were shipped by Almaden personnel to Bondar Clegg / Intertek Testing Services (ITS) preparation facility in San Luis Potosi. Samples were then forwarded to the Bondar Clegg / ITS North Vancouver, British Columbia laboratory for analysis. Between 2007 and 2010 rock grab, soil and silt samples were driven by Almaden or CGH personnel direct to the Veracruz airport and air freighted via Aeromexpress, a subsidiary of Aeromexico, to ALS Minerals (ALS) sample preparation facility in Guadalajara. Prepared sample pulps were then forwarded by ALS personnel to the ALS North Vancouver, British Columbia laboratory for analysis.

Bondar Clegg / ITS prior to being acquired by ALS in 2001, was an International Standards Organization (ISO) 9002:1987 certified geochemical analysis and assaying laboratory. ALS is currently an ISO 9001:2008 and ISO 17025-2005 certified geochemical analysis and assaying laboratory. Both Bondar Clegg / ITS and ALS are independent of Almaden and the author.

At the ALS Guadalajara sample preparation facilities, rock grab samples were dried prior to preparation and then crushed to 10 mesh (70% minimum pass) using a jaw crusher. The samples were then split using a riffle splitter, and sample splits were further crushed to pass 200 mesh (85% minimum pass) using a ring mill pulverizer (ALS PREP-31 procedure). At ALS and Bondar Clegg / ITS soil and silt samples were dried and sieved to 80 mesh.

All rock grab samples were subject to gold determination at ALS via a 30 gram (g) fire-assay (FA) fusion utilizing atomic absorption spectroscopy (AA) finish with a lower detection limit of 0.005 ppm Au (5 ppb) and upper limit of 10 ppm Au (ALS method Au-AA23).

Soil samples collected by Almaden during 1998 were analyzed by Bondar Clegg / ITS via a 30 g FA fusion utilizing and AA finish and having a lower detection limit of 5 ppb Au. Silver, base metal and pathfinder elements were analyzed via by 36-element inductively coupled plasma mass spectroscopy (ICP-MS) with an aqua-regia digestion.

Soil samples collected between 2007 and 2010 by Almaden and CGH were analyzed for gold via aqua-regia digestion of a 50 g sample utilizing and ICP-MS finish with a lower detection limit of 0.1 ppb Au and an upper limit of 100 ppb Au (ALS "ultra-trace" method Au-ST44). Samples exceeding 100 ppb Au were also analyzed using the 50 g sample ore-grade gold ICP-MS analysis, also utilizing and aqua-regia digestion (ALS method Au-OG44).

Silver, base metal and pathfinder elements for rock, soil and silt samples were analyzed by either 51-element (2007 and 2008 soils; including all rocks and silt samples) or 48 element (2010 soils) ICP-AES/MS, with aqua-regia or four acid digestions, respectively (ALS methods ME-MS41 AND ME-MS61).

### *11.1.2 RC Drilling*

During the 1998 RC drill campaign sampling was conducted at the drill rig by Almaden personnel. RC holes were sampled at 5 foot (1.53 m) intervals, down the length of the hole (half the length of the rods being used). Upon the addition of each new 10 foot drill rod the drill hole was “blasted” clean with compressed air to ensure no foreign material remained at the bottom of the prior to resumption of drilling and sampling.

Separate sample collection procedures were used depending on whether the samples were dry or wet. Dry samples were collected directly from the cyclone in a 5 gallon plastic bucket placed beneath the cyclone. Subsequently, samples were passed through a 50% splitter twice to obtain a 25% sample to be submitted for analysis. The remaining 75% of the sample was retained for future reference. Similarly, a 25% split of wet samples was obtained using a circular rotating splitter placed beneath the cyclone. Collection of water suspended fines was ensured by placement of a tub beneath the sample bucket to catch water overflow. The tub was in turn allowed to overflow and recovered fines were added to the original sample. Several tests were carried out to determine the amount of fines not collected by this method. To this effect, all overflowing water was collected from one split and compared to the material collected from the first method. The amount of fines was found to be comparable in both cases. Both the sample collection buckets and splitter apparatus were cleaned between samples using compressed air and/or clean water (Poliquin, 1998).

In preparation for shipping, RC drill samples were placed into plastic twine (rice) sacks and sealed using locking plastic cable ties. Samples were then shipped by Almaden personnel to Bondar Clegg / ITS preparation facility in San Luis Potosi. Subsequent to crushing and pulverization, samples were shipped to CDN Resource Laboratories (CDN), Burnaby, British Columbia facility where certified reference standards were inserted into the sample stream. Samples were then forwarded by CDN personnel to Bondar Clegg / ITS North Vancouver, British Columbia laboratory for analysis.

At the San Luis Potosi preparation facility samples were crushed, pulverized and a 500 g pulp prepared, which was then shipped to CDN, Burnaby, British Columbia. At CDN a 125 g gold standard was inserted at the previously marked position in the sample stream. In addition, at the same time, a 125 g split from the original 500 g pulps was made. The splits and standard were then sent by CDN personnel to the Bondar Clegg / ITS North Vancouver, British Columbia laboratory for analysis.

The 1998 RC samples were analyzed by Bondar Clegg / ITS via a 30 g FA fusion utilizing an AA finish and having a lower detection limit of 5 ppb Au. Silver, base metal and pathfinder elements were analyzed via 28-element inductively coupled plasma mass spectroscopy (ICP-MS) with an aqua-regia digestion.

### 11.1.3 Diamond Drill Core

Drill core was half-sawn using industry standard gasoline engine-powered diamond core saws, with fresh water cooled blades and “core cradles” to ensure a straight cut. For each sample, the core logging geologist marks a cut line down the centre of the core designed to produce two halves of equal proportions of mineralization. This is accomplished by marking the cut line down the long axis of ellipses described by the intersection of the veins with the core circumference.

Areas of very soft rock (e.g. fault gouge), are cut with a machete using the side of the core channel to ensure a straight cut. Areas of very broken core (pieces <1 cm) were sampled using spoons. After cutting, half the core was placed in a new plastic sample bag and half was placed back in the core box. Between each sample, the core saw and sampling areas were washed to ensure no contamination between samples. Field duplicate, blank and analytical standards were added into the sample sequence as they were being cut.

Sample numbers were written on the outside of the sample bags twice and the numbered tag from the ALS sample book was placed inside the bag with the half core. Sample bags were sealed using single plastic cable ties. Sample numbers were checked against the numbers on the core box and the sample book.

Drill core samples collected by Almaden, Comaplex and CGH were placed into plastic twine (rice) sacks, sealed using single plastic cable ties. Samples were then driven by Almaden or CGH personnel direct to the Veracruz airport and air freighted via Aeromexpress to ALS Minerals (ALS) sample preparation facility in Guadalajara. Prepared sample pulps were then forwarded by ALS personnel to the ALS North Vancouver, British Columbia laboratory for analysis.

The 2004 Comaplex, and 2008 and 2009 CGH, drill core samples were subject to gold determination via a 30 g FA fusion with an AA finish (ALS method Au-AA23). Subsequent drilling by Almaden during 2012 and 2013 utilized a 50 g FA fusion (ALS method Au-AA24). Both methods have a lower detection limit of 0.005 ppm Au (5 ppb) and upper limit of 10 ppm Au. A 30 or 50 g prepared sample is fused with a flux mixture, inquarted with 6 mg of gold-free silver and then cupelled to yield a precious metal bead. The bead is digested in 0.5 mL dilute nitric acid and 0.5 mL concentrated hydrochloric acid. The digested solution is cooled, diluted to a total volume of 4 mL with de-mineralized water, and analyzed by AA spectroscopy against matrix-matched standards.

Over limit gold values (>10 ppm Au) were subject to gravimetric analysis, whereby a 30 or 50 g prepared sample is fused with a mixture of lead oxide, sodium carbonate, borax, silica and other reagents in order to produce a lead button. The lead button containing the precious metals is cupelled to remove the lead. The remaining gold and silver bead is parted in dilute nitric acid, annealed and weighed as gold (ALS methods Au-GRA21 and Au-GRA22).

Silver, base metal and pathfinder elements for the 2004 Comaplex, and 2007 and 2008 CGH drill core samples were analyzed by 33-element ICP-AES, with an aqua-regia

digestion (ALS method ME-ICP41). Subsequent drilling by Almaden during 2012 and 2013 utilized 33-element ICP-AES with a four acid digestion (ALS method ME-ICP61). For both methods a 0.25 g prepared sample is dissolved in aqua-regia or four acid solutions, diluted to 12.5 ml with deionized water or dilute hydrochloric acid, and analyzed by ICP-AES.

#### *11.1.4 Author's Drill Core and Rock Grab Samples*

Drill core and surface rock grab samples collected by Kristopher J. Raffle, P.Geo., were placed into sealed plastic bags and transported by the author to ALS North Vancouver, British Columbia laboratory for gold FA and ICP-MS analysis.

The samples were dried prior to preparation and then crushed to 10 mesh (70% minimum pass) using a jaw crusher. The samples were then split using a riffle splitter, and sample splits were further crushed to pass 200 mesh (85% minimum pass) using a ring mill pulverizer (ALS PREP-31 procedure).

Rock samples collected by the author were subject to gold determination via a 50 g AA finish FA fusion with a lower detection limit of 0.005 ppm Au (5 ppb) and upper limit of 10 ppm Au (ALS method Au-AA24).

Silver, base metal and pathfinder elements for rock and soil samples were analyzed by 33-element ICP-AES, with a four acid digestion (ALS method ME-ICP61). A 0.25 g prepared sample is digested with aqua-regia. The residue is topped up with dilute hydrochloric acid and the resulting solution is analyzed by ICP-AES.

#### 11.2 Quality Assurance / Quality Control Procedures

For the El Cobre rock grab, soil and stream silt geochemical programs Almaden and CGH relied on external quality assurance and quality control (QA/QC) measures employed by ALS. QA/QC measures at ALS include routine screen tests to verify crushing efficiency, sample preparation duplicates (every 50 samples), and analytical quality controls (blanks, standards, and duplicates). QC samples are inserted with each analytical run, with the minimum number of QC samples dependant on the rack size specific to the chosen analytical method. Results for quality control samples that fall beyond the established limits are automatically red-flagged for serious failures and yellow-flagged for borderline results. Every batch of samples is subject to a dual approval and review process, both by the individual analyst and the Department Manager, before final approval and certification. The author has no reason to believe that there are any issues or problems with the preparation or analyzing procedures utilized by ALS.

During 1998 RC drilling Almaden employed a QC/QC program that included the insertion of analytical standard, blank and duplicate samples into the sample stream. A single gold analytical standard CDN-GS-2 having an accepted value of 1.53 g/t Au ( $\pm$  0.18 g/t Au at the 2 standard deviation 95% confidence interval) was used. Blank sample material was obtained by drilling a special RC hole into unmineralized basalt rocks from within the Property. QA/QC samples were inserted into the sample stream at a rate of 15%; thus 3 in 20 samples comprised analytical standard, blank or duplicate

samples. Only one analytical standard returned gold assay values outside the 2 standard deviation limits. Blank samples returned generally low values, ranging from below detection limits for gold, with a single sample returning 19 ppb Au. Duplicate samples were subject to Thompson and Howart (1978) analysis to estimate analytical precision. The results, where precision equals 100%, indicate a 31 ppb Au sample preparation and assay detection limit, which is higher than the 5 ppb Au cut-off given by Bondar Clegg / ITS.

For the 2004 Complex drilling, analytical standard and blanks were inserted into the sample stream at inconsistent intervals of every 20 samples; thus 2 in approximately 20 samples comprised analytical standard and blank samples. Almaden and the author were unable to determine the accepted values for the analytical standard used by Comaplex, however a review of hard copy analytical results show the range of blank samples all to be below the 5 ppb detection limit for gold, with copper values up to a maximum of 28 ppm Cu.

Drill core samples since 2008 were subject to an internal QA/QC program that included the insertion of analytical standard, blank and duplicate samples into the sample stream. During the 2008 and 2009 CGH drilling, approximately 10 QA/QC samples were inserted for every 100 samples sent to the laboratory. During the 2012 and 2013 Almaden drilling, a total of 15 QA/QC samples were inserted for every 100 samples sent to the laboratory. QA/QC sample results were reviewed following receipt of each analytical batch. Where the re-analyses fall within acceptable QA/QC limits the values are added to the drill core assay database. Summary results of the internal QA/QC procedures employed at El Cobre are presented below.

In the author's opinion, the QA/QC procedures are reasonable for this type of deposit and the current level of exploration. A total of 264 QA/QC analytical standard and blank samples, and a total of 145 quarter-core duplicates were submitted for analysis. In addition, external QA/QC measures employed by ALS included the analysis of a total of 34 prep duplicates and 82 pulp duplicates. Based on the results of the QA/QC sampling summarized below, the analytical data is considered to be accurate; the analytical sampling is considered to be representative of the drill sample, and the analytical data to be free from contamination.

### *11.2.1 Analytical Standards*

A total of 7 different analytical standards were used for drilling completed between 2008 and 2013 at the El Cobre Project. Each standard has an accepted gold and copper concentration as well as known "between laboratory" standard deviations, or expected variability, for each element. Standards used during 2012 and 2013 were also certified for molybdenum. For the 2008 and 2009 CGH drill program, one analytical standard was inserted into the sample stream for every ~30 samples (3%). During the 2012 and 2013 Almaden program, one analytical standard was inserted for every 20 samples (5%). QA/QC summary charts showing measured values for each analytical standard in addition to the certified value, and the second and third "between laboratory" standard deviations for gold and copper are presented in Figure 11-1, and for molybdenum in Figure 11-2.

There are two general industry criteria employed by which standards are assigned a “pass” or “reviewable” status. First, a “reviewable” standard is defined as any standard occurring anywhere in a drill hole returning greater than three standard deviations (>3SD) above or below the accepted value for an element (Au, Cu, Mo). Second, if two or more consecutive standards from the same batch return values greater than two standard deviations (>2SD) above or below the accepted value on the same side of the mean for at least one element, they are classified as “reviewable”. QA/QC samples falling outside established limits are flagged and subject to review and possible re-analysis, along with the 10 preceding and succeeding samples.

A total of 143 analytical standards and 121 blanks were inserted into the sample stream of 2,689 assays for the 15 diamond drill holes completed between 2008 and 2013. Of the 143 standards analyzed for gold and copper, 107 standards from the 2012 and 2013 program were also analyzed for molybdenum. Seventeen (17) standards (12%) were initially considered “reviewable” according to the criteria outlined above. Of the 17 reviewable standards, 11 were flagged for returning isolated (non-consecutive) values greater than 3SD from the certified value for Au, Cu or Mo. Of these, three (one each of CDN-CM-2, CDN-CGS-15, and CDN-CM-25) returned values only slightly greater than 3SD from the certified Cu value, and were therefore deemed acceptable. Similarly, two CDN-CM-14 standards returned Mo values slightly greater than 3SD from the certified value, and were not considered for further review.

Four CDN-CM-22 analytical standards were initially “reviewable” because they returned isolated values greater than 3SD below the accepted value for Cu. However the accepted value for this standard’s is 0.995% Cu, a value that is very close to the 1% Cu upper limit of the ME-ICP61 analytical method for which the standard is certified (four acid ICP or AA). Given that the four samples returned conservative (low) values for copper, they were not considered for further review.

Figure 11-1. QA/QC Analytical Standards (Cu – Au)

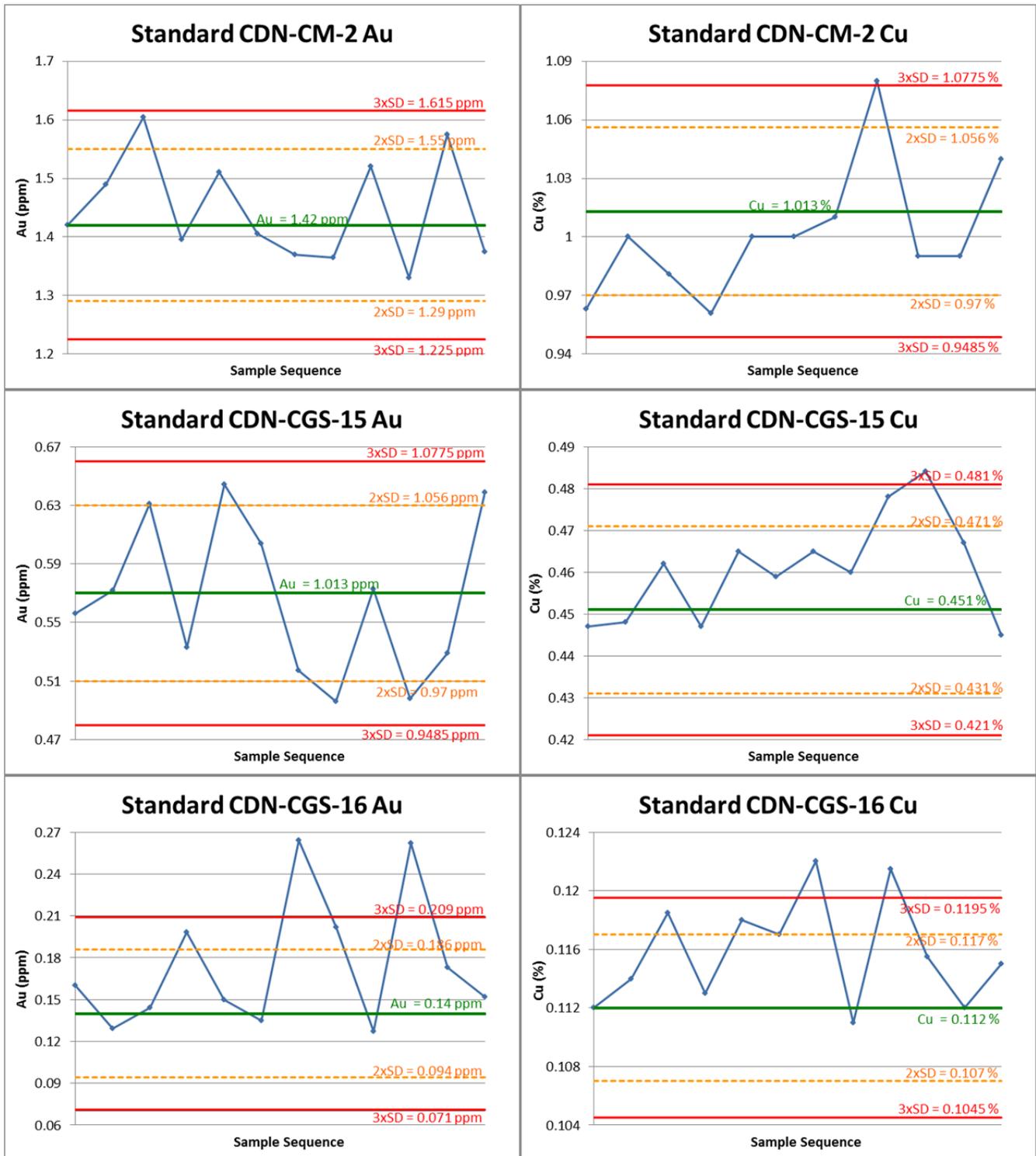


Figure 11-1. (con'd). QA/QC Analytical Standards (Cu – Au)

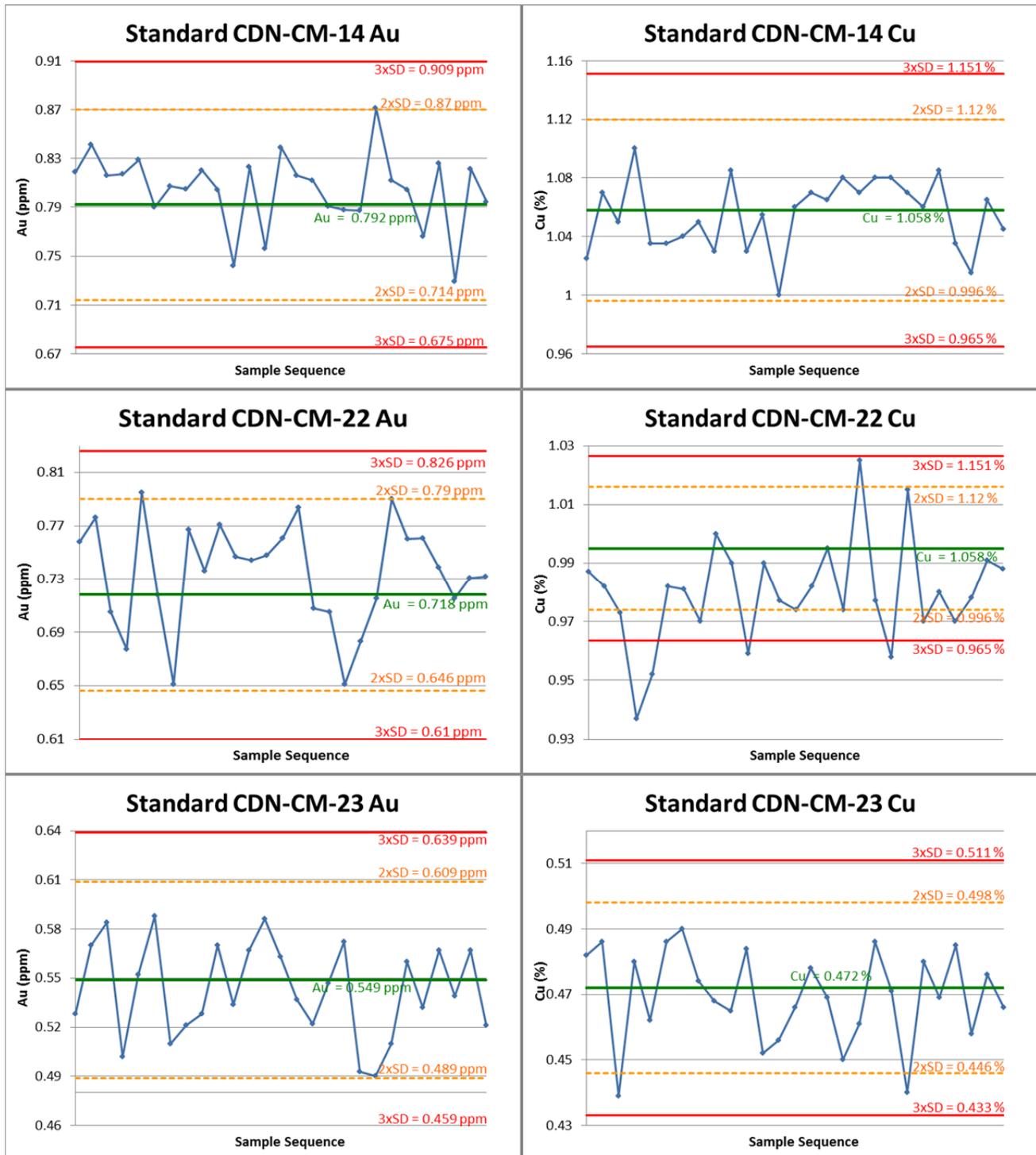


Figure 11-1. (con'd). QA/QC Analytical Standards (Cu – Au)

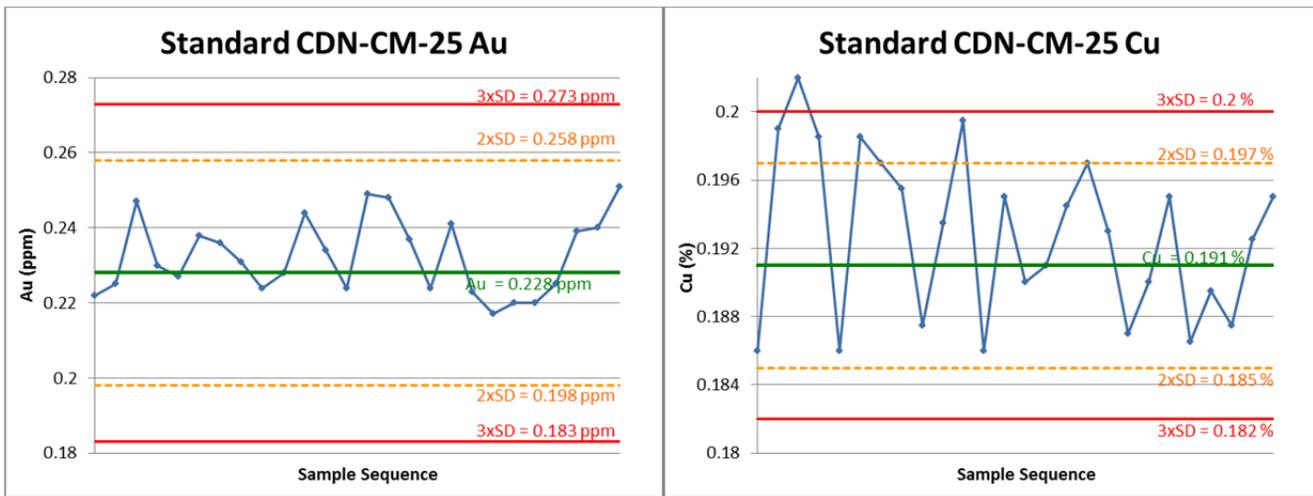
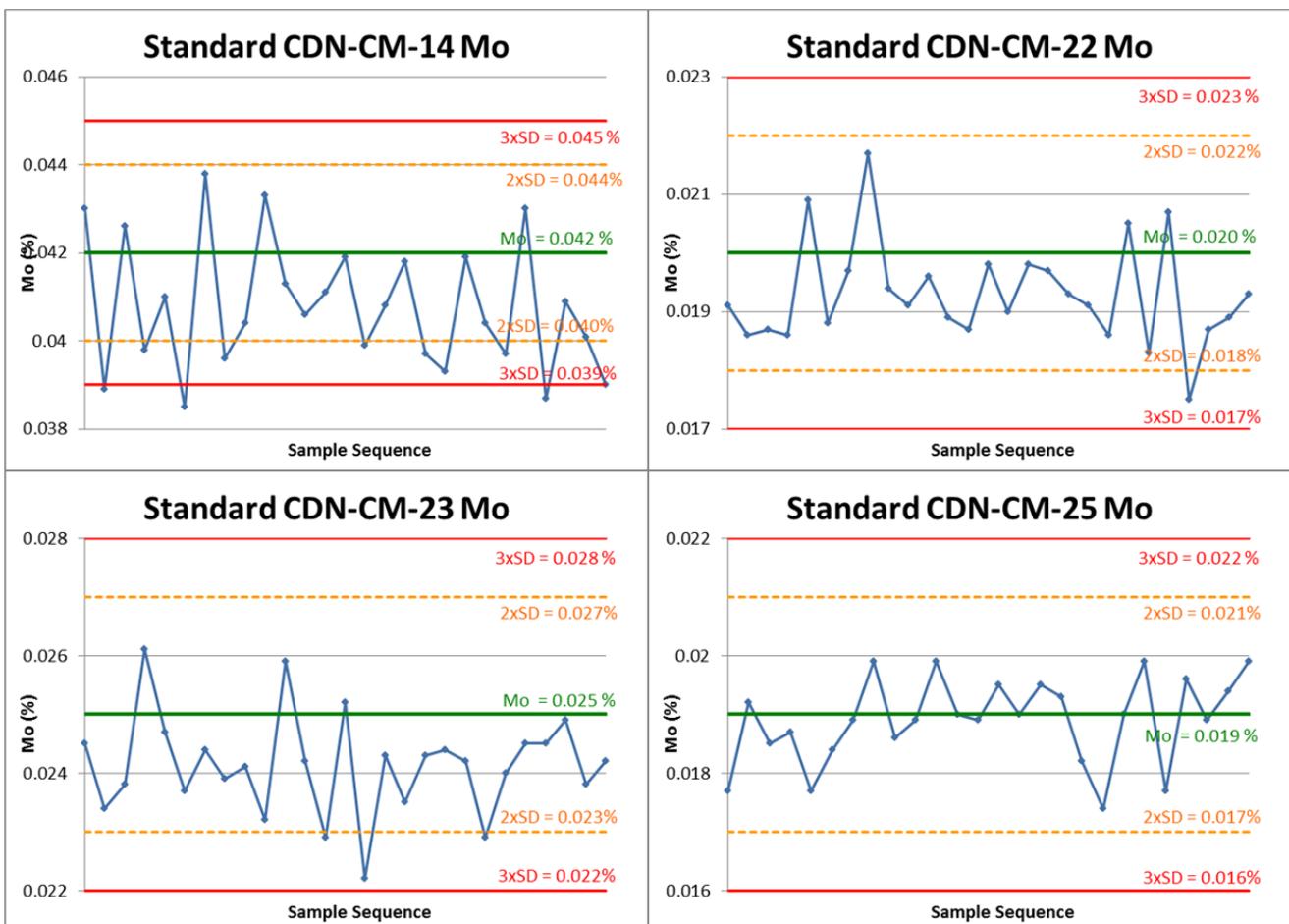


Figure 11-2. QA/QC Analytical Standards (Mo)



Two CDN-CGS-16 standards returned isolated Cu and/or Au values greater than 3SD from the certified values. One standard was flagged for both Cu and Au, the other for Au alone. One other CDN-CGS-16 standard returned an Au value greater than 3SD above the certified value, and was followed consecutively by a CDN-CM-2 standard that returned an Au value greater than 2SD above the certified value. CDN-CGS-16 has an Au reference standard deviation (RSD) value classifying it as an “indicated mean”. According to the certification document published by CDN, “indicated values cannot be used to monitor accuracy with a high degree of certainty”. For this reason, these standards were not considered for further review.

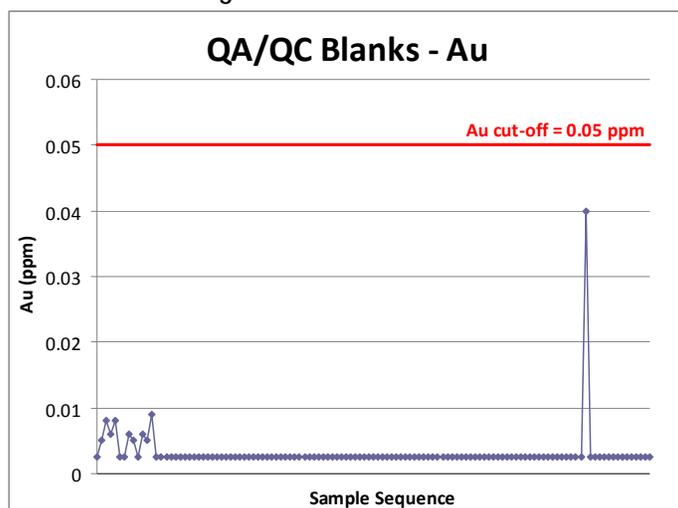
The four remaining standards flagged were reviewed for consecutive values in excess of 2SD from the certified value for Mo and Au. One CDN-CM-14 returned a value greater than 3SD below the certified value for Mo and was followed by one CDN-CM-22 with a value greater than 2SD below the certified value. Because the >3SD value is only marginally below the 3SD cut off and the samples returned conservative (low) values, they were not considered for further review. Consecutive samples of CDN-CM-2 and CDN-CGS-15 returned values greater than 2SD above the certified value for Au. However, because neither standard returned values >3SD for Au and both standards passed for Cu, no additional review was conducted.

### 11.2.1 Blanks

Blank material for the 2008 to 2009 CGH drilling and 2012 to 2013 Almaden drilling was chosen based on material that had very low gold (Au) and/or copper (Cu) grades, such as previously sampled core, or local blank gravel. During the 2008 and 2009 CGH drilling, one blank for every 50 samples (2%) was inserted into the sample stream. During the 2012 and 2013 Almaden drilling, one blank for every 20 samples (5%) was inserted into the sample stream at the ‘10’, ‘30’, ‘50’, ‘70’, and ‘90’ positions. Blank samples had an upper limit cut-off value of 50 ppb (0.05 ppm) Au as a threshold.

Of the 121 blank samples analyzed since 2008, no blanks returned assays greater than the accepted values of 50 ppb Au (Figure 11-3).

Figure 11-3. QA/QC Blanks



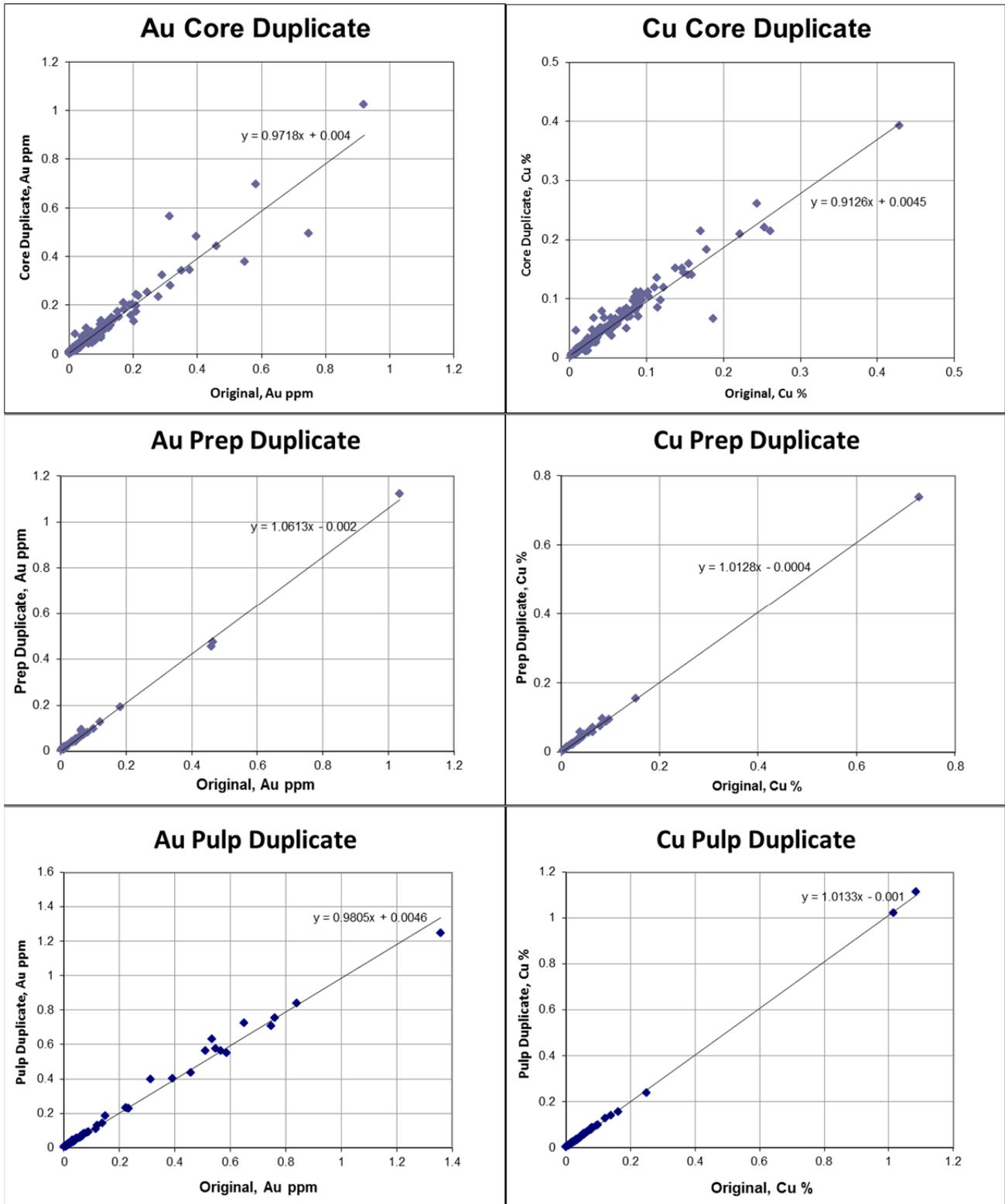
### 11.2.2 Duplicates

Quartered-core duplicate samples were collected to assess the overall repeatability of individual analytical values. For the 2008 and 2009 CGH drilling, one core duplicate for every 25 samples (4%) was inserted into the sample stream. During the 2012 and 2013 Almaden drilling, one core duplicate for every 20 samples (5%) was inserted into the sample stream. A total of 37 quarter-core duplicates were inserted into the sample stream by CGH during the 2008 and 2009 drilling and 108 quarter-core duplicates during the 2012 and 2013 drilling completed by Almaden, for an overall total of 145 quarter-core duplicate samples.

As part of their internal QA/QC program, ALS completed routine re-analysis of prep (coarse reject) and pulp duplicates to monitor precision. Only the prep and pulp duplicates for the 2012 and 2013 drilling by Almaden are available. During the 2012 and 2013 sampling, ALS analyzed a total of 34 prep and 82 pulp duplicates for gold and copper.

Charts showing original versus duplicate quarter-core, prep and pulp duplicate values for gold and copper show a significant and progressive increase in sample repeatability (Figure 11-4). Increased repeatability is expected as the level of duplicate sample homogenization increases from low (quarter-core) to moderate (prep) and high (pulp). The data indicates a high level of repeatability for both prep (coarse reject) and pulp duplicates. This is interpreted to indicate a low “nugget” effect with respect to El Cobre gold and copper analyses. Excluding primary geologic heterogeneity (quarter-core), the data show a homogenous distribution of gold and copper values within El Cobre drill core.

Figure 11-4. QA/QC Duplicates



## 12 Data Verification

The author conducted a reconnaissance of the El Cobre Property September 16, 2014 to verify the reported exploration results. The author completed a traverse of the El Porvenir and Los Banos zones, where he collected surface rock grab samples, and recorded the location of select drill collars consistent with those reported by Almaden. Additionally, Almaden's drill core facility at Tinajitas was made available and the author reviewed mineralized intercepts in drill core from a series of holes from the El Porvenir, Los Banos, and Norte zones. The author personally collected half drill core samples as 'replicate' samples from select reported mineralized intercepts.

A comparison of the results of the authors 'replicate' sampling versus original Almaden reported values for gold; silver and copper are presented in Table 12-1.

Table 12-1. Authors Independent Drill Core and Rock Grab Sample Assays

Authors Sample	Easting	Northing	Drill Hole	Almaden Sample	From (m)	To (m)	Interval (m)	Au (ppm) Author / Almaden	Ag (ppm) Author / Almaden	Cu (%) Author / Almaden	Description
14KRP301	Tinajitas		CD-04-01	64797	194.00	196.00	2.00	2.06 / 2.37	1.48 / 2.37	0.45 / 0.47	K-altered monzonite, 2-5 mm quartz vein controlled py-cpy
14KRP302	Tinajitas		EC-13-004	119822	603.00	605.00	2.00	0.68 / 0.61	0.91 / 0.9	0.26 / 0.29	K-altered monzonite porphyry
14KRP303	Tinajitas		08-CBN-019	494058	173.7	176.8	3.04	0.39 / 0.72	0.69 / 0.9	0.20 / 0.38	K-quartz-py altered diorite
14KRP304	765,549	2,173,540	Surface Rock Grab					4.57	423.00	0.08	Quartz-py veined, Silicified dacite tuff
14KRP305	765,342	2,173,380	Surface Rock Grab					0.52	4.58	0.04	quartz vein boulder float in creek, disseminated pyrite
14KRP306	765,783	2,171,920	Surface Rock Grab					0.06	0.32	0.03	clay altered fine grained tuff
14KRP307	765,970	2,172,050	Surface Rock Grab					2.11	56.70	0.15	quartz vein boulder in creek, disseminated pyrite

Based on the results of the traverses, drill core review, and 'replicate' sampling the author has no reason to doubt the reported exploration results. Slight variation in assays is expected due to variable distribution of ore minerals within a core section but the analytical data is considered to be representative of the drill samples.

## 13 Adjacent Properties

The author has not visited the Caballo Blanco gold project. This section titled "Adjacent Properties" is based on a review of available public company documents including press releases, annual reports, and NI 43-101 technical reports as listed in the "References" section. However, all sources of information referred to in this section were prepared by Qualified Person's as defined by NI 43-101 and are assumed accurate based on based on the data review conducted by the author.

Almaden's El Cobre Property is located southwest to the adjacent Caballo Blanco gold project, 100% owned by Goldgroup Mining Inc. (Goldgroup). The Caballo Blanco project consists of 15 mineral concessions covering 54,000 hectares. Two known large areas of epithermal gold mineralization, the Northern Zone and the Highway Zone, occur as

prominent high-sulphidation epithermal gold prospects within extensive areas of clay and silica alteration.

The Caballo Blanco project is targeting two distinct deposit types, defined as high-sulphidation epithermal gold and porphyry copper-gold. The Caballo Blanco project shares a similar geological history to Almaden's El Cobre Property: they both lie at the eastern end of the Trans-Mexican Volcanic Belt, are underlain by Middle Miocene mafic sub-volcanic and intrusive rocks, that are in turn covered by a Late Miocene silicic volcanism sequence.

The principal known gold zone at Caballo Blanco is the La Paila Zone, located within the Northern Zone. The La Paila Zone exhibits fully oxidized gold zones contained within a cluster of high-sulphidation epithermal alteration areas. An updated NI 43-101 mineral resource estimate for La Paila was completed on February 7, 2012. At a 0.2 g/t Au cut-off the La Paila Zone comprises and indicate mineral resource of 28,890,000 tonnes averaging 0.62 g/t Au and 2.32 g/t Ag (575,000 ounces Au and 2,150,000 ounces Ag); and and inferred mineral resource of 24,020,000 tonnes averaging 0.54 g/t Au and 2.50 g/t Ag (419,000 ounces Au and 1,930,000 ounces Ag) (Cuttle and Giroux, 2012).

The mineral resources were classified in accordance with guidelines established by the CIM "Estimation of Mineral Resources and Mineral Reserves Best Practice Guidelines" dated November 23<sup>rd</sup>, 2003 and CIM "Definition Standards for Mineral Resources and Mineral Reserves" dated November 27<sup>th</sup>, 2010. Mineral resources are not mineral reserves and do not have demonstrated economic viability. There is no guarantee that all or any part of the inferred mineral resource will be converted into a mineral reserve. Mineral resources within the Caballo Blanco project are not necessarily indicative of mineralization within Almaden's El Cobre Property.

The NI 43-101 mineral resource was followed by a Preliminary Economic Assessment (PEA), completed on May 7, 2012. Based on a base case of US\$1,500 per ounce gold and US\$30 per ounce silver, the Caballo Blanco project is expected to generate a 66.4% pre-tax internal rate of return ("IRR"), and a US\$283.8 million pre-tax net present value ("NPV") at a 5% discount rate, and produce nearly 687,000 ounces of gold and 1.3 million ounces of silver, based on current mineral resources. According to the results of the PEA, at full production of 20,000 tonnes per day, Goldgroup expects annual production of 95,000 ounces of gold for years two to seven, for total production of 687,000 ounces of gold and 1.3 million ounces of silver for the expected life-of-mine (LOM) of 7.5 years. The preliminary economic assessment is preliminary in nature, includes inferred mineral resources that are considered too speculative geologically to have the economic considerations applied to them that would enable them to be categorized as mineral reserves, and there is no certainty that the preliminary economic assessment will be realized. Mineral resources that are not mineral reserves do not have demonstrated (Keane et al., 2012).

## 14 Other Relevant Data and Information

The author is not aware of any other relevant information with respect to the El Cobre Property that is not disclosed in the Technical Report.

## 15 Interpretation and Conclusions

Between 1998 and 2013 Almaden and partners completed airborne magnetic-radiometric, surface Induced Polarization (IP) / resistivity and Titan-24 DCIP/MT (direct current IP / magnetotelluric) geophysical surveys, in addition to extensive soil geochemistry, geologic mapping, Reverse Circulation (RC) and diamond drilling at the El Cobre Property. Exploration has resulted in the definition of three areas of porphyry and epithermal copper-gold mineralization known as the Los Banos, El Porvenir and Norte zones over a distance of 5 km.

Surface mapping and soil geochemical surveys over the three zones define copper-gold-molybdenum (Cu-Au-Mo) and lead-zinc-silver-gold (Pb-Zn-Ag-Au) soil anomalies. The Cu-Au-Mo anomalies are associated with porphyritic monzodiorite intrusive rocks showing early potassic (potassium-feldspar  $\pm$  biotite-magnetite) alteration associated with malachite (thin fractures in surface outcrop), chalcopyrite and traces of bornite (in drill core). Distinct Pb-Zn-Ag-Au soil anomalies are spatially separated from the porphyry zones (defined by Cu-Au-Mo soil anomalies) and may represent a younger mineralization episode (or a higher-level mineral zone). On surface Pb-Zn-Ag-Au anomalies are associated with broad areas of quartz vein float hosted within clay and sulphate (acid-sulphate) altered volcanic rocks typical of intermediate sulphidation veins, commonly associated with and adjacent to lithocaps of high-sulphidation deposits.

The Los Banos, El Porvenir and Norte zones are associated with prominent airborne magnetic and IP chargeability anomalies. Limited RC and diamond drill testing has returned wide intercepts of porphyry copper-gold; and narrow zones epithermal gold-silver mineralization. At El Porvenir, 7 holes intersected mineralized porphyry zones in averaging greater than 0.10% Cu and 0.10 grams-per-tonne (g/t) Au over 130 metres (m). Hole EC-13-004 intersected 0.23% Cu and 0.36 g/t Au over 106 m, to a depth of 504 m, indicating significant mineralization at depth in the El Porvenir Zone. In the Los Banos Zone, hole CB5 intersected a zone of significant clay alteration, quartz veining and silicification grading 1.63 g/t Au and 0.12% Cu over 15 m. All five drill holes in the Norte Zone intersected porphyry-style mineralization. Hole 08-CBCN-022, one of the deepest holes drilled at Norte, returned values of 0.14% Cu with 0.19 g/t Au over 259 m. All of the zones remain open along strike and at depth, with numerous drill holes terminating in mineralization.

The IP data indicate that the majority of the strongly chargeable zones have significant depth. 3D inversions suggest that the anomalies associated with each of the mineralized zones at El Cobre extend below the depth tested by the current drilling. Results from the Titan-24 survey reaffirm this interpretation. Chargeabilities in excess of 80 milliradians (mrad) are observed in coincidence with low resistivity areas in the Los

Banos, El Porvenir, and Villa Rica zones. A weaker chargeability response associated with moderate to high resistivity is observed in the Norte Zone.

Several anomalous areas remain untested by drilling, including the Villa Rica Zone that is defined by a strong north-northwest trending magnetic-chargeability high and associated copper-gold soil geochemical anomaly. The Cerro Marin zone is defined by a magnetic low anomaly with a coincident weak geochemical response and deep IP chargeability within a topographic low area (basin). Approximately one kilometre west-southwest of the Los Banos Zone, a discrete sub-vertical chargeability high occurs, which lacks a significant magnetic anomaly. The anomaly is associated with an approximately 600 x 600 m copper-gold soil geochemical anomaly. At the north end of the Los Banos zone a significant copper-gold soil geochemical anomaly lies at the north end of a northeast trending linear magnetic anomaly tested in part at its south end by drill hole CB5, which intersected significant copper-gold mineralization.

## 16 Recommendations

Based on the presence of porphyry copper-gold and epithermal gold mineralization exposed at surface and intersected by RC and diamond drill holes, favourable geology, and high priority coincident magnetic-chargeability geophysical, copper and gold in soil geochemical anomalies; the El Cobre Property is of a high priority for follow-up exploration.

The 2015 exploration program should include but not be limited to:

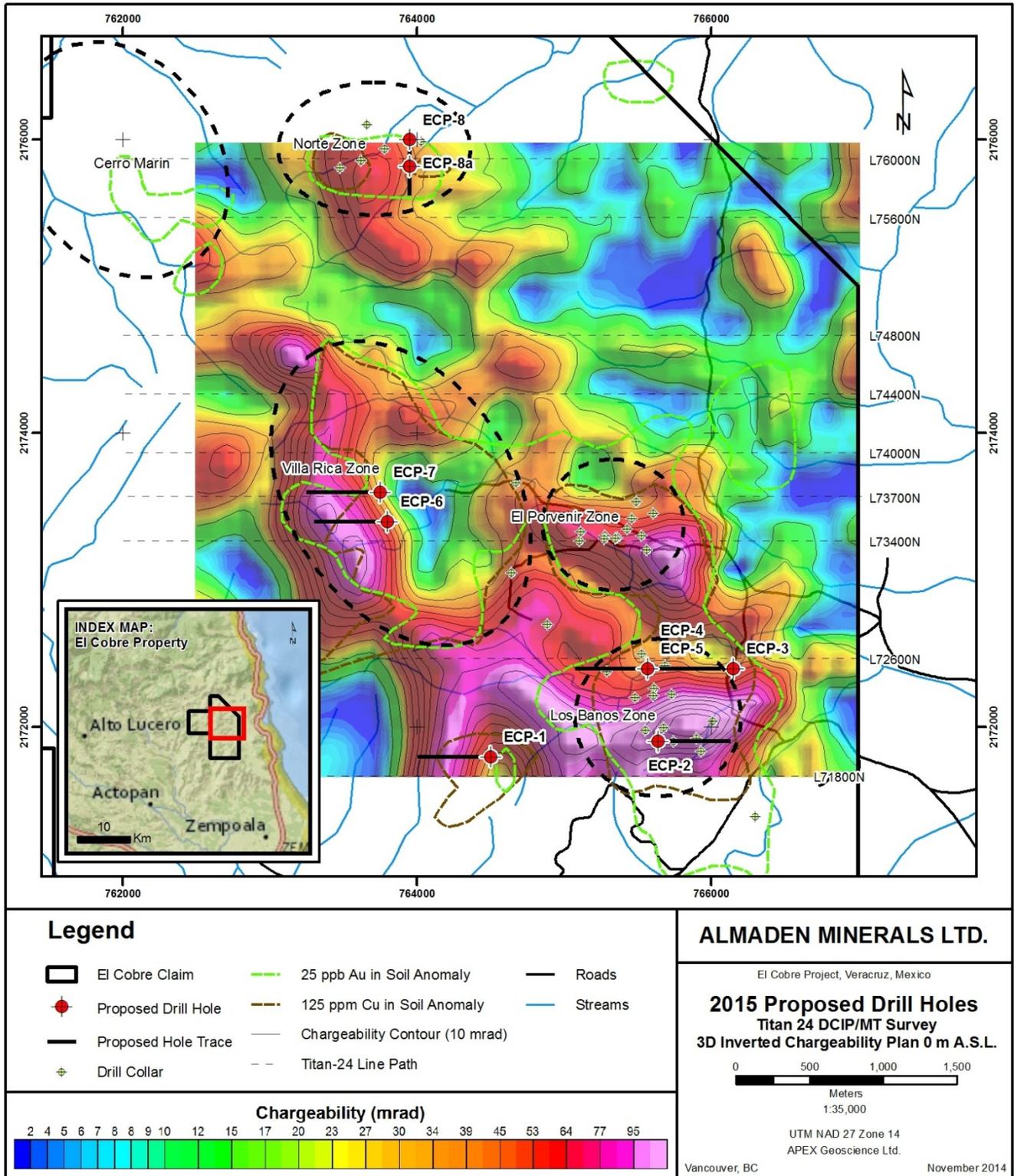
Diamond drilling of approximately 9 holes totalling 7,000 m designed to test combined magnetic and IP chargeability plus copper-gold soil geochemical anomalies at El Cobre. Specifically, drilling should be carried out in two phases. The Phase 2 exploration is contingent on the results of Phase 1 exploration. **Phase 1** drilling should include diamond drilling of an initial 4 holes totalling 3,000 m followed by **Phase 2** drilling of an additional 5 holes totalling 4,000 m. The estimated cost to complete Phase 1 and Phase 2 drilling is \$770,000.00 (Table 16-1).

More specifically, **the Phase 1 and Phase 2 exploration should include:** **1)** Two (2) holes totalling 2,000 m designed to target untested magnetic-chargeability geophysical and coincident copper-gold soil geochemical anomalies at the Villa Rica Zone. **2)** Two (2) holes totalling 1,200 m designed to test the Norte Zone chargeability anomaly at depth where previous diamond drill holes 08-CBCN-19, 08-CBCN-22 and 08-CBCN-42 ended in porphyry copper-gold mineralization. **3)** One (1) drill hole totalling approximately 700 m designed to target the untested chargeability and copper-gold soil anomaly located 1 km west of the Los Banos Zone. **4)** Four (4) holes totalling approximately 3,100 m designed to test at depth a significant chargeability anomaly at the Los Banos zone and confirm previous RC drill hole results from CB-5, CB-12 and CB-13 that ended in mineralization (Figure 16-1).

Table 16-1. Proposed 2015 Drilling Budget for El Cobre

<b>Budget Item</b>	<b>Estimated Cost</b>
<u>Initial Diamond Drilling to extend known mineralization at the El Cobre Property</u> PHASE 1: Diamond Drilling 3,000 m (@ \$110/metre all-up)	<b>\$330,000.00</b>
TOTAL PHASE 1:	<b>\$330,000.00</b>
<u>Additional Diamond Drilling to follow up on Phase 1 drilling and extend known mineralization at the El Cobre Property</u> PHASE 2: Diamond Drilling 4,000 m (@ \$110/metre all-up)	<b>\$440,000.00</b>
TOTAL PHASE 2:	<b>\$440,000.00</b>
TOTAL PROJECT COSTS, excluding GST	<b>\$770,000.00</b>

Figure 16-1. El Cobre Proposed 2015 Drill Holes



## 17 Date and Signature Page

This Technical Report was prepared to NI 43-101 standards by the following Qualified Persons. The effective date of this report is November 3, 2014.



Kristopher J. Raffle, B.Sc., P.Geo.  
APEX Geoscience Ltd.  
Vancouver, British Columbia, Canada  
November 3, 2014

## 18 References

- Almaden Minerals Ltd. (2010): Caballo Blanco Project Update; News Release, February 22, 2010, URL < <http://www.almadenminerals.com/News%20Releases/2010/feb22-10.html>> [November 2014].
- Almaden Minerals Ltd. (2011): Almaden Closes El Cobre / Caballo Blanco Transaction; News Release, October 17, 2011, URL < <http://www.almadenminerals.com/News%20Releases/2011/Oct17-11.html>> [November 2014].
- Barham, B. and Noel, N. (2005): 2005 Exploration Report Caballo Blanco Property, Actopan Municipality, Veracruz, Mexico, Including Diamond Drilling, Geological Mapping and Geochemistry; Comaplex Minerals Corp. Internal Report.
- Cantagrel, J.M. and Robin, C. (1979): K-Ar dating on eastern Mexican volcanic rocks – relations between the andesitic and the alkaline provinces; *Journal of Volcanology and Geothermal Research*, v. 5, no. 1-2, p. 99-114.
- Cuttle, J. and Giroux, G. (2012): NI 43-101 Technical Report – Caballo Blanco Project, Resource Update at the La Paila Zone, Veracruz State, Mexico, 114p.
- Dickson, B.L. and Scott, K.M. (1997): Interpretation of aerial gamma-ray surveys – adding the geochemical factors; *Journal of Australian Geology and Geophysics*, v. 17, no. 2, p. 187-200.
- Ferrari, L., Tagami, T., Eguchi, M., Orozco-Esquivel, T., Petrone, C., Jacobo-Albarran, J., and López-Martínez, M. (2005): Geology, geochronology and tectonic setting of late Cenozoic volcanism along the southwestern Gulf of Mexico: The Eastern Alkaline Province revisited; *Journal of Volcanology and Geothermal Research*, v. 146, p. 284-306.
- Gómez-Tuena, A., LaGatta, A., Langmuir, C., Goldstein, S., Ortega-Gutierrez, F., and Carraco-Núñez, G. (2003): Temporal control of subduction magmatism in the Eastern Trans-Mexican volcanic belt: mantle sources, slab contributions and crystal contamination. *Geochemistry, Geophysics, Geosystems*, v. 4., no. 8, 33p.
- Gómez-Tuena, A., Orozco-Esquivel, M., Ferrari, L. (2007): Igneous petrogenesis of the Trans-Mexican Volcanic Belt; *Geological Society of America, Special Paper 422*, p. 129-181.
- Keane, J.M., Bailey, B.C., Cuttle, J., Giroux, G., Taylor, S., Pilotto, D. (2012) Preliminary Economic Assessment Cabalo Blanco Heap Leach, Veracruz, Mexico, 239p.
- López-Infanzón, M. (1991): Petrographic study of volcanic rocks from the Chiconquaico – Palma Sola area, Central Veracruz, Mexico: MS Thesis, Tulane University, New Orleans, LA.
- Mitchinson, D.E., Enkin, R.J, and Hart, C.J.R. (2013): Linking Porphyry Deposit Geology to Geophysics via Physical Properties: Adding Value to Geoscience BC Geophysical Data; *Geoscience BC Report 2013-14*.
- Orozco-Esquivel, T., Petrone, C.M., Ferrari, L., Tagami, T., and Manetti, P. (2007): Geochemical and isotopic variability in lavas from the eastern Trans-Mexican Volcanic Belt: Slab detachment in a subduction zone with varying dip; *Lithos*, v. 93, p. 149-174.
- Panteleyev, A. (1995): Porphyry Cu-Au: (Alkalic); *Selected British Columbia Mineral Deposit Profiles*; BC Ministry of Energy and Mines Open File 1995-20, v. 1, p. 83-86.
- Poliquin, M.J. (1998): Report on the RC Drilling Project in April-May, 1998 at the Caballo Blanco Project, Veracruz, Mexico; Almaden Resources Corp. Internal Report.

Ray, G.E. (1995): Pb-Zn Skarns; Selected British Columbia Mineral Deposit Profiles; BC Ministry of Energy and Mines Open File 1995-20, v. 1, p. 61-62.

Sillitoe, R.H. (2010): Porphyry copper systems, *Economic Geology*, v. 105, pp. 3-41

Teliz, F., Hernandez, H., Mehner, D., and Christoffersen, J. (2008): Exploration Report on the Caballo Blanco Project, Veracruz, Mexico; Minera Cardel S.A. de C.V. and Canadian Gold Hunter Corp. Internal Report.

Teliz, F., Hernandez, H., and Mehner, D. (2009): Progress Report on the Caballo Blanco Project, Veracruz, Mexico; Minera Cardel S.A. de C.V. and Canadian Gold Hunter Corp. Internal Report.

## 19 Certificate of Author

### 19.1 Kristopher J. Raffle Certificate of Author

I, Kristopher J. Raffle, residing in Vancouver British Columbia, do hereby certify that:

1. I am a Principal of APEX Geoscience Ltd. ("APEX"), 200, 9797 – 45 Avenue, Edmonton, Alberta, Canada.
2. I am the author and am responsible for all sections of this Technical Report entitled: "**Technical Report on the El Cobre Property, Veracruz, Mexico**", and dated November 3, 2014 (the "Technical Report").
3. I am a graduate of The University of British Columbia, Vancouver, British Columbia with a B.Sc. in Geology (2000) and have practiced my profession continuously since 2000. I have supervised numerous exploration programs specific to porphyry copper-gold and epithermal gold-silver deposits having similar geologic characteristics to the El Cobre Property throughout British Columbia, Canada and Mexico. I am a Professional Geologist registered with APEGBC (Association of Professional Engineers and Geoscientists of British Columbia) and I am a 'Qualified Person' in relation to the subject matter of this Technical Report.
4. I visited the Property that is the subject of this Report on September 16<sup>th</sup>, 2014. I have no prior involvement with the Property.
5. I am independent of Almaden Minerals Ltd. and Minera Gavilán S.A. de C.V. , applying all of the tests in section 1.5 of National Instrument 43-101. I have not received, nor do I expect to receive, any interest, directly or indirectly, in Almaden Minerals Ltd. or Minera Gavilán S.A. de C.V.. I am not aware of any other information or circumstance that could interfere with my judgment regarding the preparation of the Technical Report.
7. I have read and understand National Instrument 43-101 and Form 43-101 F1 and the Report has been prepared in compliance with the instrument.
8. To the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
9. I consent to the filing of the Technical Report with any stock exchange and other regulatory authority and any publication by them, including electronic publication in the public company files on their websites accessible by the public, of the Technical Report.

Dated this November 3, 2014

Vancouver, British Columbia, Canada



Kristopher J. Raffle, B.Sc., P.Geo.

## Appendix 1 – El Cobre Property Drill Hole Locations

Hole_ID	Easting	Northing	Elevation	Az	Dip	Length	Type	Zone	Year
CB1	765104	2173271	128	90	-60	169.16	RC	El Porvenir	1998
CB2	765362	2173293	109	270	-50	194.00	RC	El Porvenir	1998
CB3	765562	2173207	99	270	-50	154.00	RC	El Porvenir	1998
CB4	765610	2173454	106	270	-50	145.00	RC	El Porvenir	1998
CB5	765901	2171929	122	270	-50	168.00	RC	Los Banos	1998
CB6	765747	2171905	129	90	-50	102.10	RC	Los Banos	1998
CB7	765933	2171837	104	105	-50	151.00	RC	Los Banos	1998
CB8	766011	2172043	92	270	-60	145.00	RC	Los Banos	1998
CB9	765734	2172224	124	90	-50	136.00	RC	Los Banos	1998
CB10	765614	2172265	111	90	-50	145.00	RC	Los Banos	1998
CB11	765610	2172215	111	270	-55	172.00	RC	Los Banos	1998
CB12	765291	2172382	150	90	-50	114.29	RC	Los Banos	1998
CB13	765688	2172420	97	90	-55	123.44	RC	Los Banos	1998
CB14	765553	2171979	135	90	-45	99.00	RC	Los Banos	1998
CB15	766300	2171393	110	270	-50	145.00	RC	Los Banos	1998
CB16	765483	2172203	118	270	-55	130.00	RC	Los Banos	1998
CB17	765681	2172000	145	270	-55	102.10	RC	Los Banos	1998
DDH04CB1	765276	2173284	122	270	-60	300.23	DDH	El Porvenir	2004
DDH04CB2	765431	2173349	125	90	-60	215.80	DDH	El Porvenir	2004
CB02-01	764890	2172700	120	0	-90	269.00	DDH	El Porvenir	2002
CB02-02	764644	2173050	250	0	-90	302.00	DDH	El Porvenir	2002
CB02-03	764673	2173667	120	0	-90	343.00	DDH	El Porvenir	2002
CB02-04	765530	2172500	120	0	-90	231.30	DDH	Los Banos	2002
CB02-08	765461	2173421	120	90	-50	90.00	DDH	El Porvenir	2002
CB02-09	765493	2173536	120	90	-50	73.00	DDH	El Porvenir	2002
08-CBCN-019	763782	2175938	222	180	-50	187.45	DDH	Norte	2008
08-CBCN-021	763478	2175808	268	180	-50	108.20	DDH	Norte	2008
08-CBCN-022	763622	2175856	244	180	-50	304.19	DDH	Norte	2008
08-CBCN-023	765278	2173305	122	180	-50	295.13	DDH	El Porvenir	2008
08-CBCN-024	763660	2176100	285	180	-50	229.20	DDH	Norte	2008
08-CBCN-025	765278	2173305	112	180	-75	318.51	DDH	El Porvenir	2008
08-CBCN-026	765117	2173330	117	180	-50	349.91	DDH	El Porvenir	2008
08-CBCN-027	765527	2173307	112	360	-60	272.80	DDH	El Porvenir	2008
08-CBCN-028	765117	2173331	177	180	-75	403.86	DDH	El Porvenir	2008
09-CBCN-042	764030	2175985	210	180	-55	367.89	DDH	Norte	2009
EC-12-001	765607	2173456	116	270	-40	206.04	DDH	El Porvenir	2012
EC-12-002	765607	2173456	116	270	-65	611.43	DDH	El Porvenir	2012
EC-12-003	765276	2173284	111	90	-75	651.05	DDH	El Porvenir	2012
EC-13-004	765352	2173286	108	230	-50	710.18	DDH	El Porvenir	2013
EC-13-005	765352	2173286	108	230	-72	1050.34	DDH	El Porvenir	2013

## Appendix 2 – Author’s 2014 Property Visit Analytical Certificate



ALS Canada Ltd.  
 2103 Dollarton Hwy  
 North Vancouver BC V7H 0A7  
 Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: APEX GEOSCIENCE LTD.  
 200-9797 45 AVE  
 EDMONTON AB T6E 5V8

Page: 1  
 Total # Pages: 2 (A - D)  
 Plus Appendix Pages  
 Finalized Date: 17-OCT-2014  
 Account: TTB

**CERTIFICATE VA14141809**

Project: 99883

This report is for 7 Rock samples submitted to our lab in Vancouver, BC, Canada on 7-OCT-2014.

The following have access to data associated with this certificate:

BAHRAM BAHRAMI	KRIS RAFFLE	CHERRY WILLIAMS
----------------	-------------	-----------------

<b>SAMPLE PREPARATION</b>	
ALS CODE	DESCRIPTION
WEI-21	Received Sample Weight
LOG-22	Sample login - Rcd w/o BarCode
CRU-QC	Crushing QC Test
PUL-QC	Pulverizing QC Test
CRU-31	Fine crushing - 70% <2mm
SPL-21	Split sample - riffle splitter
PUL-31	Pulverize split to 85% <75 um

<b>ANALYTICAL PROCEDURES</b>		
ALS CODE	DESCRIPTION	
ME-MS61	48 element four acid ICP-MS	
Ag-OG62	Ore Grade Ag - Four Acid	VARIABLE
ME-OG62	Ore Grade Elements - Four Acid	ICP-AES
Au-AA24	Au 50g FA AA finish	AAS

To: APEX GEOSCIENCE LTD.  
 ATTN: KRIS RAFFLE  
 200-9797 45 AVE  
 EDMONTON AB T6E 5V8

This is the Final Report and supersedes any preliminary report with this certificate number. Results apply to samples as submitted. All pages of this report have been checked and approved for release.

\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*

Signature:   
 Colin Ramshaw, Vancouver Laboratory Manager



ALS Canada Ltd.  
 2103 Dollarton Hwy  
 North Vancouver BC V7H 0A7  
 Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: APEX GEOSCIENCE LTD.  
 200-9797 45 AVE  
 EDMONTON AB T6E 5V8

Page: 2 - A  
 Total # Pages: 2 (A - D)  
 Plus Appendix Pages  
 Finalized Date: 17-OCT-2014  
 Account: TTB

Project: 99883

**CERTIFICATE OF ANALYSIS VA14141809**

Sample Description	Method Analyte Units LOR	WEI-21 Recvd Wt. kg	Au-AA24 Au ppm	ME-MS61 Ag ppm	ME-MS61 Al %	ME-MS61 As ppm	ME-MS61 Ba ppm	ME-MS61 Be ppm	ME-MS61 Bi ppm	ME-MS61 Ca %	ME-MS61 Cd ppm	ME-MS61 Ce ppm	ME-MS61 Co ppm	ME-MS61 Cr ppm	ME-MS61 Cs ppm	ME-MS61 Cu ppm
		0.02	0.005	0.01	0.01	0.2	10	0.05	0.01	0.01	0.02	0.01	0.1	1	0.05	0.2
14KRP301		0.28	2.06	1.48	7.70	1.3	890	1.56	0.95	0.27	0.07	33.8	7.0	38	6.31	4540
14KRP302		0.38	0.677	0.91	7.04	19.2	1070	1.23	0.21	0.47	0.22	44.0	8.6	19	2.52	2550
14KRP303		0.30	0.385	0.69	6.98	2.6	780	1.43	6.45	0.24	0.03	30.0	9.2	38	5.26	2020
14KRP304		0.54	4.57	>100	0.52	180.5	210	0.53	101.5	0.08	2.04	11.05	2.4	46	0.49	801
14KRP305		0.38	0.515	4.58	0.21	15.3	1040	0.91	0.54	0.05	0.64	2.32	4.4	43	0.52	405
14KRP306		0.68	0.062	0.32	8.13	3.5	520	1.60	1.95	0.09	0.09	49.7	1.4	29	1.72	261
14KRP307		0.66	2.11	56.7	0.30	50.5	800	0.52	50.4	0.07	1.31	5.90	13.5	22	0.43	1505

\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*



ALS Canada Ltd.  
 2103 Dollarton Hwy  
 North Vancouver BC V7H 0A7  
 Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: APEX GEOSCIENCE LTD.  
 200-9797 45 AVE  
 EDMONTON AB T6E 5V8

Page: 2 - B  
 Total # Pages: 2 (A - D)  
 Plus Appendix Pages  
 Finalized Date: 17-OCT-2014  
 Account: TTB

Project: 99883

**CERTIFICATE OF ANALYSIS VA14141809**

Sample Description	Method Analyte Units LOR	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	
		Fe %	Ga ppm	Ge ppm	Hf ppm	In ppm	K %	La ppm	Li ppm	Mg %	Mn ppm	Mo ppm	Na %	Nb ppm	Ni ppm	P ppm
		0.01	0.05	0.05	0.1	0.005	0.01	0.5	0.2	0.01	5	0.05	0.01	0.1	0.2	10
14KRP301		2.75	20.2	0.08	0.2	0.117	2.92	18.9	10.3	0.60	364	5.14	0.07	7.8	29.6	490
14KRP302		2.84	17.30	0.11	0.1	0.075	2.72	27.0	9.0	0.67	453	16.80	2.02	7.5	9.4	460
14KRP303		2.50	19.30	0.14	0.1	0.121	3.03	17.0	4.4	0.25	77	4.59	0.15	5.4	15.3	370
14KRP304		7.77	2.96	0.14	0.1	0.400	0.15	7.1	23.3	0.03	653	4.55	0.02	<0.1	13.1	630
14KRP305		2.61	1.09	0.06	<0.1	0.018	0.05	1.3	24.5	0.02	1040	10.85	0.01	0.1	11.6	130
14KRP306		4.27	16.00	0.15	0.2	0.054	3.29	31.0	5.8	0.26	53	9.53	0.18	2.9	5.9	770
14KRP307		10.70	1.72	0.09	0.1	0.137	0.06	5.2	22.4	0.04	6400	13.00	0.01	0.1	25.0	330

\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*



ALS Canada Ltd.  
 2103 Dollarton Hwy  
 North Vancouver BC V7H 0A7  
 Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: APEX GEOSCIENCE LTD.  
 200-9797 45 AVE  
 EDMONTON AB T6E 5V8

Page: 2 - C  
 Total # Pages: 2 (A - D)  
 Plus Appendix Pages  
 Finalized Date: 17-OCT-2014  
 Account: TTB

Project: 99883

**CERTIFICATE OF ANALYSIS VA14141809**

Sample Description	Method Analyte Units LOR	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	ME-MS61	
		Pb ppm	Rb ppm	Re ppm	S %	Sb ppm	Sc ppm	Se ppm	Sn ppm	Sr ppm	Ta ppm	Te ppm	Th ppm	Ti %	Tl ppm	U ppm
14KRP301		7.0	106.0	0.020	1.58	0.57	3.1	4	0.9	25.4	0.69	0.22	14.4	0.136	2.99	2.6
14KRP302		44.8	90.2	0.210	0.85	0.91	2.8	3	1.2	194.0	0.58	<0.05	15.2	0.125	2.06	2.3
14KRP303		16.1	109.0	0.026	2.57	0.88	3.9	6	1.4	54.1	0.44	1.14	13.6	0.100	3.42	2.6
14KRP304		1645	5.8	<0.002	0.15	809	1.4	14	0.9	117.0	<0.05	81.1	0.6	0.031	0.28	1.1
14KRP305		151.0	2.4	0.002	0.08	22.8	0.5	1	0.2	47.6	<0.05	0.83	0.2	0.005	0.20	0.3
14KRP306		38.3	117.0	0.005	0.19	1.18	4.2	19	1.2	53.3	0.27	1.43	17.7	0.064	1.70	1.7
14KRP307		1855	2.8	0.002	0.29	17.75	0.9	9	3.2	201	<0.05	27.7	0.2	0.005	0.80	0.5

\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*



ALS Canada Ltd.  
 2103 Dollarton Hwy  
 North Vancouver BC V7H 0A7  
 Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: APEX GEOSCIENCE LTD.  
 200-9797 45 AVE  
 EDMONTON AB T6E 5V8

Page: 2 - D  
 Total # Pages: 2 (A - D)  
 Plus Appendix Pages  
 Finalized Date: 17-OCT-2014  
 Account: TTB

Project: 99883

**CERTIFICATE OF ANALYSIS VA14141809**

Sample Description	Method Analyte Units LOR	ME-MS61 V ppm 1	ME-MS61 W ppm 0.1	ME-MS61 Y ppm 0.1	ME-MS61 Zn ppm 2	ME-MS61 Zr ppm 0.5	Ag-OG62 Ag ppm 1
14KRP301		53	0.8	3.5	43	3.2	
14KRP302		48	0.4	5.0	87	2.2	
14KRP303		56	0.6	3.4	8	2.0	
14KRP304		20	0.1	1.3	376	2.6	423
14KRP305		16	23.1	6.8	262	<0.5	
14KRP306		57	0.6	2.2	26	6.1	
14KRP307		202	83.6	9.0	838	2.7	

\*\*\*\*\* See Appendix Page for comments regarding this certificate \*\*\*\*\*



ALS Canada Ltd.  
2103 Dollarton Hwy  
North Vancouver BC V7H 0A7  
Phone: 604 984 0221 Fax: 604 984 0218 www.alsglobal.com

To: APEX GEOSCIENCE LTD.  
200-9797 45 AVE  
EDMONTON AB T6E 5V8

Page: Appendix 1  
Total # Appendix Pages: 1  
Finalized Date: 17-OCT-2014  
Account: TTB

Project: 99883

**CERTIFICATE OF ANALYSIS VA14141809**

<b>CERTIFICATE COMMENTS</b>													
	<p style="text-align: center;"><b>ANALYTICAL COMMENTS</b></p> <p>Applies to Method: REE's may not be totally soluble in this method. ME-MS61</p> <p style="text-align: center;"><b>LABORATORY ADDRESSES</b></p> <p>Processed at ALS Vancouver located at 2103 Dollarton Hwy, North Vancouver, BC, Canada.</p> <table><tr><td>Applies to Method: Ag-OG62</td><td>Au-AA24</td><td>CRU-31</td><td>CRU-QC</td></tr><tr><td>LOG-22</td><td>ME-MS61</td><td>ME-OG62</td><td>PUL-31</td></tr><tr><td>PUL-QC</td><td>SPL-21</td><td>WEI-21</td><td></td></tr></table>	Applies to Method: Ag-OG62	Au-AA24	CRU-31	CRU-QC	LOG-22	ME-MS61	ME-OG62	PUL-31	PUL-QC	SPL-21	WEI-21	
Applies to Method: Ag-OG62	Au-AA24	CRU-31	CRU-QC										
LOG-22	ME-MS61	ME-OG62	PUL-31										
PUL-QC	SPL-21	WEI-21											