

**EXECUTIVE SUMMARY**  
**SAN CARLOS PROJECT, MEXICO**  
**May, 2009**

**MORGAN J. POLIQUIN, M.Sc., P.ENG.**  
**PRESIDENT**  
**ALMADEN MINERALS LTD.**

## **Summary**

The San Carlos Project covers a large, north-south elongate elliptical intrusive complex which has come into contact with folded deformed carbonate rocks forming calc-silicate skarn bodies. High-grade copper-gold skarn ore was mined historically from pods of skarned limestone that are located internal to the intrusive, but no modern exploration was carried out to locate porphyry-style mineralization within the intrusive or skarn ore along the intrusive-limestone contacts until Almaden's acquisition of the property. Almaden identified the area in 1999 and over time acquired a 100% interest in several large claims comprising roughly 21,000 hectares in area which enclose the intrusive complex. Several small claims not controlled by Almaden are located internal to the Almaden claim block. These claims, totaling 126 hectares in area, cover of historic mine workings located on small skarned limestone bodies, or rafts, located within the intrusive. They were once held under option by Almaden but are now not considered important to the project but could be reacquired.

The exploration work carried out to date explored only a small portion of the intrusive-limestone contact but has returned encouraging results. These results include the identification of a large area of porphyry-style Cu-Mo-Au mineralization. In addition high-grade zinc values were encountered likely associated with sulphide, replacement-style mineralization. The highlights from the drilling conducted include 12.11 meters of 0.11% Cu and 247.50 metres of 0.04% Cu and 0.008% Mo within the mineralized intrusive. Highlights of drilling which targeted skarn mineralization include 1.24 g/t Au and 1.26% Cu over 2.80 metres and 6.6 g/t over 1.4 meters.

Only about a 25% of the intrusive-limestone contact (the northeastern quarter) has been surveyed with IP geophysics and grid soil sampling. The limited drilling carried out in this area failed to test the high Pb-Zn-Ag in soil and chargeability anomalies. In addition the large Cu-Mo in soil anomaly remains open to the west as the soil survey was not completed to cover this part of the intrusive where mineralized and altered intrusive has been identified. A review of the past soil geochemistry, geologic mapping and IP and magnetics geophysics suggests that the holes drilled were located on the periphery of a donut shaped Mo in soil anomaly which encompasses the best Cu in soil and porphyry-style alteration and mineralization. This area is considered a high priority porphyry copper target. Three holes were drilled on the periphery of this target area and intersected propylitic altered intrusive, quartz-veining and copper grades consistent with this interpretation.

In order to better define the porphyry copper target, in 2008 and 2009 Almaden conducted an IP and soil sampling program over the Central-West portion of the intrusive complex. This work resulted in the discovery of a new IP chargeability-and highly anomalous Cu Au and Mo in soil response in an area of stockwork veining. Geologic mapping and rock-chip sampling is presently being planned for this area.

Geologic mapping and rock chip sampling surveys should be extended to cover the northern altered area of the intrusive outcrop as well as the entire intrusive-limestone contact zone prior to undertaking a large drill program to test the present targets as well as those which may further be identified both within the intrusive and along its contacts with the limestone.

## **Introduction and Geologic Setting**

The San Carlos property is located within a north-south belt of high-K alkalic to calc-alkalic igneous rocks, typical of those associated with back-arc environments, known as the Eastern Alkalic Province (EAP). A literature review of such rocks in eastern Mexico led to the recognition of the San Carlos area by Almaden in 1999. The intrusive rocks of the San Carlos project core a 25 kilometre long prominent ridge, called the Sierra San Carlos, which the claims cover. At the north end of the ridge, in

the San Jose district, the intrusive rocks are associated with copper-gold porphyry and skarn alteration and mineralisation. High-grade copper-gold skarn bodies, all located within the intrusive complex itself, were mined historically in the San Jose district. Numerous small to large bodies of contact skarn occur distributed throughout the San Jose area. These bodies range in size from a few metres to large zones hundreds of metres long and up to a hundred metres wide. Within these bodies, copper-gold-bearing breccia bodies have been mapped underground in the San Jose area (at Santa Elena and La Begonia) composed of clasts of dacite porphyry and skarn. Mineralization normally occurs in the form of copper oxides near surface, but local zones of sulphide mineralization are exposed at deeper levels. The mineralized skarn bodies vary from a few metres, to approximately 200 metres wide.

It is the author's contention that the structural and geologic setting as well as the chemistry of igneous rocks associated with mineralization in the San Carlos area are very similar to that of high-K calc-alkaline rocks that host deposits such as the Grasberg and Bingham deposits where similar intrusive rocks were emplaced into folded limestones and are associated with copper-gold porphyry and skarn related mineralisation.

### Location and Access

The San Carlos project is situated in the State of Tamaulipas, Mexico, approximately 220 kilometres south of Monterrey, and approximately 120 kilometres NE of the major center of Ciudad Victoria (population 180,000) (Figure 1). From Ciudad Victoria, access is via major paved roads to the town of San Carlos, a distance of approximately 150 kilometres, then for an additional 45 kilometres by good all weather roads to the San Jose prospect.

### Mineral Title and Surface Rights

The San Carlos project consists of six mineral title claims wholly owned by Almaden covering a roughly 21,611 hectare area. The claims cover the Sierra San Carlos as well as two other intrusive centres located to the east of this ridge. Since acquisition of the property, Almaden formed two separate option agreements with junior exploration companies (Aurcana Corp. and Hawkeye Gold and Diamond Corp.) both of which have expired without the optionee having earned an interest. The wholly owned Almaden claims are tabularized below.

<b>Concession Name</b>	<b>Title Number</b>	<b>Area in hectares</b>	<b>File Number</b>
San Jose	217935	1,818.3	7/1.3/1115
Red. San Carlos frac.1	218916	7,730.2	7/1.121-1160
Red.San Carlos frac. 2	218917	2,164.6	7/1.121-1160
San Jose 2	215760	20.0	101/00036
San Carlos 2	215840	100.0	101/00046
San Carlos 3	225375	9,777.8	101/00121
<b>Total</b>		<b>21,610.95</b>	

Internal to the Almaden claim block are 8 claims owned by a separate party which cover roughly 126 hectares. These claims are located in the San Jose area of the property and cover some of the historic skarn showings that occur within the intrusive body. The claims are owned by a Monterrey family who also own the surface rights to the project. An agreement to purchase a 100% interest in these claims was acquired by Almaden, but has been allowed to lapse. These claims do not cover the areas thought prospective for porphyry mineralization nor do they cover the intrusive contact environment as they are located internal to the intrusive system.

## Past Work

### *Historic Mining*

The San Jose area covers an irregular area of outcrop of a multi-phase intrusive body roughly 4.5 by 3 kilometres in size. The intrusive is associated with several skarn bodies developed in limestone country rock. In the late 1800's, the San Carlos Copper Company established mining at San Jose, and produced copper and gold from numerous underground mines, including the Begonia, Santa Elena and Bretana mines. During this time, a 59 kilometre railroad was built from the city of Linares. Mining ceased in 1910. Only limited exploration and mining has been carried out since. Historic reports indicate that the ores graded several percent copper and were accompanied by high gold grades. Between the years 1934 and 1944, 4,067 Tons of direct shipping ore averaging 11 g/t gold and 4 % copper were recorded to have been produced from a small scale operation.

### *Almaden Minerals*

Modern exploration began when Almaden Minerals acquired claims in the area and conducted reconnaissance prospecting, silt sampling, grid-controlled soil sampling and airborne geophysical studies over the San Jose area and nearby lands between 1999 and 2002. The airborne magnetics geophysical survey outlined the intrusive complex and identified several satellite magnetic high features which may represent skarn or additional intrusive bodies.

### *Aurcana Corp.*

In 2002 Almaden optioned the project to Aurcana Corp. In 2002 to 2003 Aurcana carried out a small underground mapping and sampling program at the south end of the property (in the Begonia and La Homogenia historic mines), additional grid controlled soil sampling, surface geological mapping, a three dimensional Induced Polarization survey, and drilled a total of 1,428 metres of NQ size core in seven holes. After the drill program Aurcana returned the property to Almaden, terminating their option.

The soil sampling program outlined a large Cu-Mo anomaly in the northwest portion of the intrusive complex as well as a large Au anomaly on the northeastern side of the intrusive. This Au in soil anomaly was not followed up by Aurcana.

The underground sampling returned significant copper and gold values in a breccia body from the Begonia workings.

<b>Sample Numbers</b>	<b>Location</b>	<b>Length (m)</b>	<b>Copper (%)</b>	<b>Gold (g/t)</b>	<b>Silver (g/t)</b>
263501-263517	Western channel	34	0.55	1.92	1.89
263518-263524; 263701-263707	Western area, zone of stoping	28	1.8	5.05	6.5
263530-263550	Extension of main entrance adit	40	0.47	1.33	2.53
263539-263550	Breccia-only portion of above samples	24	0.57	1.90	4.89
263717-263731	Eastern channel across breccia	30	0.40	1.79	1.23
263712-263716	Vertical channels, far western end	1.2-1.9; individual samples	2.49-6.99	4.37-20.58	5.8->100

Three of the drill holes were located at the south end of the property in the Begonia area of skarn mineralization and two targeted the copper-gold mineralized breccia body identified and sampled underground. These two holes failed to intersect the mineralization identified in the historic workings, but a review of the data suggests that the orientation of the breccia body was such that the holes could not have intersected it. These holes did intersect a sequence of white marble and sections of silicified dyke. Only weakly anomalous gold, copper and molybdenum values were encountered. Hole SC02-03 was drilled under the collapsed workings believed to be represent the La Homogenia Mine. Only one interval was assayed returning 1.24 g/t Au, 1.26% Cu over 2.80 metres in a zone of skarn.

Holes SC03-04 and SC03-05 were drilled to test the porphyry target. While both holes were drilled within the large chargeability anomaly, they were on the edge of the copper in soil anomaly. This hole intersected 247.50 metres of 0.04% Cu and 0.008% Mo in an altered and quartz veined intrusive including an intersection of 0.11% Cu and 0.010% Mo over 3.0 meters. Hole SC03-05 intersected Cu-Mo mineralization in a stockwork-veined intrusive but was only partially sampled. The section samples returned 0.06% Cu and 0.009% Mo over 42.67 meters from 87.48 to 130.15 meter. This section ended with a 3.0 meter interval that returned 0.19% Cu and 0.021% Mo. Hole SC03-06 was drilled in the vicinity of the historic La Reyna skarn mine. It intersected quartz stockwork veined intrusive rocks containing pyrite and chalcopyrite but was not sampled.

Hole SC03-07 was drilled to test elevated copper soil geochemistry values co-incident with a chargeability anomaly near the historic workings of the Santo Domingo mine. An altered and quartz-veined intrusive was intersected and the core was sampled in two sections; 38.71 to 63.09 metres returned 24.38 meters of 0.07% Cu and 185.00 to 197.12 metres returned 12.11 meters of 0.11% Cu.

#### *Hawkeye Gold and Diamond*

In 2004 Almaden optioned the San Carlos Project to Hawkeye Gold. This option was terminated in 2006. Hawkeye Gold contracted Archer Cathro and Associates to supervise a geologic mapping, soil sampling and IP geophysics program to cover, and extend if possible, the area of high Au in soil identified by Aurcana. All the work done by Hawkeye was over the northeastern 25% of the intrusive-limestone contact, with no work conducted over the porphyry system or any other portion of the contact. The additional soil sampling and IP geophysics defined several large high chargeability responses associated with both Au and Pb-Zn-Ag soil anomalies. Geologic mapping and rock chip sampling carried out at the same time defined several areas of limonite boulders, skarn and siderite veins that returned significant Au and Pb-Zn-Ag values. The mapping identified a series of old workings associated with a highly silicified grey porous limestone. In situ smithsonite samples collected from a 20 cm wide vein in one of the pits returned 37.5% Zn. A 1.2 m chip sample taken across a silicified hanging wall exposure from one of the pits yielded 3.44 g/t Au, 4.7 g/t Ag and 1.44% Zn. This zone is exposed intermittently for roughly 25 m before it is obscured by jungle and talus. In several locations, siderite/jasperoid veins were identified up to 1.5 km from the main monzonite stock. Samples of these veins collected from four sites returned up to 3.73 g/t Au, 37.2 g/t Ag, 1.52% Pb and 5.63% Zn.

In 2005 and 2006, Hawkeye carried out a six hole, 950 meter diamond drill program designed to test the elevated Au in soil anomalies. Holes SC-05-01, SC-06-04, SC-06-05 and SC-06-06 were drilled within the high Au soil anomaly while holes SC-05-02 and SC-06-03 were drilled out side this anomaly in order to test two separate high chargeability geophysical responses.

Hole SC-05-01, located at the south end of the gold in soil anomaly, intersected a marble zone from the collar to 12 meters and then entered an altered porphyry body to the end of the hole (126 meters).

There are several sections that average over 100 ppb Au in the porphyry and from 0 to 1.8 meters returned 0.14% Cu in skarn. An inspection of a section displaying the Au in soil results and IP geophysics with respect to the drill hole indicates that this hole was drilled away from the geophysical and soil anomaly and could not possibly have intersected it.

Holes SC-06-04, SC-06-05 and SC-06-06 were drilled from essentially the same location in the northern portion of the Au in soil anomaly, the latter two from the same pad. A plotted section of the holes indicate that the high chargeability anomaly was not intersected. Hole SC-06-04 intersected 11 meters of 0.3 g/t Au from 2 meters to 13 meters and several other zones of anomalous gold in an altered monzonite which persisted until the end of the hole (144 meters). The 43.8 meter deep hole SC-06-05 intersected 4.4 meters from the collar of 0.2 g/t Au. The vertical hole SC-06-06 was drilled to a depth of 117 meters and cut an altered monzonite body with short several sections of marble. From 11.0 to 12.4 meters, a 1.4 meter sample returned 1.4 meters of 6.6 g/t Au in altered monzonite.

Holes SC-05-02 and SC-05-03 were drilled to test two separate high chargeability anomalies interpreted to represent zones of sulphide replacement mineralization. Hole SC-05-02 was vertical and drilled to a depth of 246.5 meters. The hole passed along the margin of the chargeability anomaly and could not have tested it. Several sections of altered monzonite were intersected with intervening sections of limestone and marble. Anomalous gold was returned with individual samples up to 0.3 g/t Au. Hole SC-05-03 was also vertical and drilled to 289.0 meters depth. It encountered a broad section of marble in between altered limestone enclosing several sections of altered monzonite. Elevated Au (up to 91 ppb) was encountered in the monzonite.

#### *Almaden 2008 and 2009 Program*

Almaden's 2008-2009 program consisted of soil sampling, IP geophysics and a limited sampling and mapping program. The soil sampling and geophysical grid was set up over an area of hydrothermal alteration within a stockwork veined portion of the intrusive body. A total of 584 soil samples were taken on a 200 meter by 50 meter grid and IP geophysics was conducted on the 200 meter spaced east west lines. This work identified a broad area of elevated copper and molybdenum in soil now called the main zone and a smaller area to the west, now known as the Lupe zone, of elevated gold, silver, copper, molybdenum in soil and chargeability responses. The Lupe zone is a new discovery and was not previously identified. The sampling and geophysics conducted over the main zone outlined a 1.5 kilometer by 500 meter zone, that remains open to the south, of highly elevated chargeability, magnetic response and copper, molybdenum and gold in values in soils. Argillic altered and quartz-sulphide veined intrusive rocks have been identified in this area. A grab sample taken of outcropping argillic altered and stockwork veined intrusive taken at the northern edge of the main zone returned 0.19% copper. At the north end of the Lupe Zone, a grab sample of Cu-oxide stained stockwork fractured intrusive rock taken from a small mine dump yielded 7.34% copper and 6.39 g/t gold.

Overall the 584 soil samples range from 0.0006 to 5.1 g/t gold (averaging 0.046 g/t gold), 13 ppm to 33,887 ppm (3.4%) copper (averaging 551 ppm copper), 0.04 to 33.7 ppm silver (averaging 0.6 ppm silver) and 0.37 to 236 ppm molybdenum (averaging 6.64 ppm molybdenum).

Within the Lupe zone which has been traced for over 1 kilometre along strike the gold in soil samples range from 0.0055 to 0.64 g/t gold (averaging 0.068 g/t gold), 79.3 ppm to 15,221 ppm (1.5%) copper (averaging 1,095 ppm copper), 0.1 to 7.6 ppm silver (averaging 1.1 ppm silver) and 0.6 to 73.3 ppm molybdenum (averaging 6.5 ppm molybdenum). The Lupe zone soil anomaly occurs on top and along the flanks of a ridge which is underlain by a discrete chargeability anomaly interpreted to reflect elevated sulphides. This anomaly is at least 200 meters across along the five two hundred meter lines

surveyed with IP geophysics. On one line 8 consecutive 50 meter spaced soil samples over 400 meters ranged from 621 ppm to 3690 ppm copper (3.7% copper) and averaged 1331 ppm copper (0.13% copper). These same samples ranged from 19.6 ppb to 100 ppb gold, averaging 56 ppb gold. Almaden's management believes that this new geochemical and geophysical anomaly relates to the porphyry system already identified on the property. Zones of stockwork veining and boulders of skarn float have been identified in the area.

### **Conclusions and Recommendations**

The San Jose intrusive complex is a large altered and mineralized area that holds great potential for hosting porphyry, skarn and manto-type base metal and precious metal deposits. The drilling done to date on the property has confirmed that the intrusive system is altered and mineralized over a large spatial area. This past drilling did not test the main targets and in several instances failed to intersect those which were intended to be tested. A large drill program is warranted and highly recommended to test the potential for a copper-gold-molybdenum porphyry mineralization and high-grade base and precious metal skarn and manto mineralization. The drilling program should be planned based on the results of a first phase ground mapping, soil sampling and geophysical program designed to complete the work left unfinished in previous programs. Neither the newly discovered Lupe zone nor the now better defined main zone have been drill tested and represent exciting porphyry targets. Mapping should focus on gathering alteration mineralogy and vein density data in order to provide vectors to porphyry copper-gold mineralization.

Mapping and rock sampling surveys need to be extended over the new target areas defined in the 2008-2009 program as well as to cover the entirety of the contact between the carbonate country rocks and the intrusive complex. Diamond drilling should be planned to test the Lupe and other targets based upon the geologic and geochemical results of this program.