

## LOS ANDES COPPER LIMITED

### Largest independent copper project in the Americas.

**Recent results dramatically enhance Los Andes' Chilean copper deposit, confirming it as one of the largest and most attractive development projects.**

Recent drilling on Los Andes' Vizcachitas deposit is further expanding a deposit which already ranks among the largest undeveloped copper deposits in the world. Those favorable results are based on an updated geological model which has allowed the geological team to target the higher grade portions of the deposit, thereby improving the average grade as they add tonnes.

The enhancements to this giant copper deposit are coming just as the mining industry is swinging into development mode and looking to acquire development-stage projects. Demand for copper continues to grow and mines are being depleted, creating the need for on-going mine development. Six years of declining copper prices resulted in underinvestment in the copper industry and a big increase in the copper price. The turnaround in the copper market, and forecasts of a looming shortage of supply, has pushed the copper mining industry and resource investors to look for high quality deposits on which to build new mines.

With the majors and investors now looking for development projects, Los Andes' deposit will soon sit near the top of the list. Within weeks, a revised resource estimate will quantify the improved grade and tonnage. An updated engineering study, due by year-end, will confirm Vizcachitas as one of the largest and most attractive copper development projects available anywhere. The recent work has also identified near-surface areas with favorable grades that make this deposit an excellent candidate for a phased development approach: a low capex initial development scenario could be developed directly by Los Andes. One of the top resource investment funds is already a large and supportive shareholder.



Located in the heart of Chile's most productive copper belt, Vizcachitas offers numerous advantages over other deposits in Chile, or worldwide, including:

- Large size (well over a billion tonnes);
- Favorable grade of copper with credits of molybdenum and silver;
- Easily accessible and at low elevation;
- Close to infrastructure;
- Water and power are readily available;
- Good metallurgy, with high recoveries;
- A clean, high quality concentrate;
- A straightforward development scenario with low stripping ratio;
- Supportive government.

#### ABOUT THE COMPANY

Symbol: TSX.V: LA  
 Shares: 244,858,136  
 Current Price: C\$0.42\*  
 Market Value: C\$102.8 million  
 \*As at September 14, 2017

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The Vizcachitas project has a long and somewhat checkered history, which led some industry players and investors to downplay the project in years gone by. The highly capable management/geological team now in charge has completely re-written the story on this project.

Its size and grade place Vizcachitas among the most attractive development projects. The numerous other advantages make the project even more desirable to an industry now in expansion mode. At the current share price, Los Andes is trading at barely one eighth of the value paid for similar projects in recent years. There is enormous upside potential in the share price as the value moves toward that fundamental value.

The mining industry is beginning to pay close attention to Vizcachitas. Investors will soon start to appreciate that a project near the top of the development list merits a substantially higher valuation than reflected in the current share price.

## **BACKGROUND**

Los Andes' Vizcachitas deposit has been explored for decades, but the fractured ownership hampered effective exploration: The overall geological picture was not well understood and the core of the deposit had previously seen little drilling. As a result, the previous resource estimate was based mainly on less favorable portions of the deposit.

That less-than-optimal resource model formed the basis of a preliminary economic assessment in 2014, which demonstrated that the project was technically viable and economically attractive. Those results showed a deposit that was, simply put, good, but not great. The recent results are elevating the project to great.

The Vizcachitas deposit is located in central Chile, on the western slope of the Andes, in the midst of a highly productive copper belt that includes El Teniente, one of the world's biggest copper mines. Previous exploration on the Los Andes property involved several successive companies, and little effort was made to tie it all together.

Over the past couple of years, Los Andes carried out a comprehensive geological review that led to a greatly improved understanding of this complex porphyry system. The geological team, for the first time, understood the distribution of copper within the multiphase system. With that improved geological understanding, they carried out two phases of drilling, the latter of which has just finished.

Results of that drilling clearly validate the revised geological model. The drilling has greatly expanded the high-grade core zone, boosting both the size and the average grade of the overall deposit. That drilling has also identified a substantial zone of high grade material near surface that appears to represent a well-located "starter pit" which could quickly repay capex.

Now in the hands of a highly-qualified management and exploration team, Vizcachitas is emerging as one of the most favorable copper development projects globally, just as the industry looks to develop new copper mines.

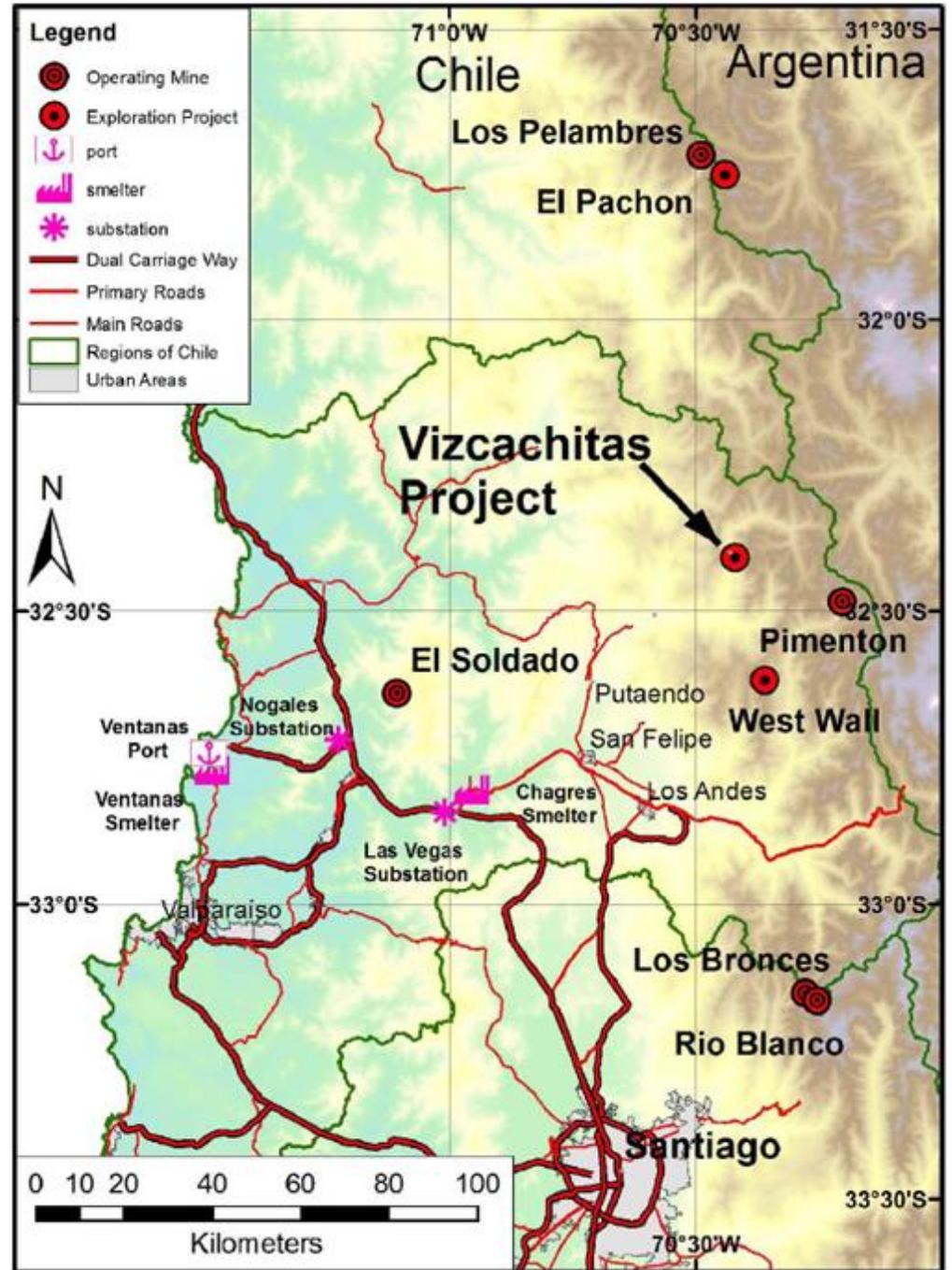
The company, focused on advancing their project over the past few years, paid only modest attention to the investor marketplace. Now, with an exciting story to tell, management has committed to ensuring that investors and the mining industry fully appreciate the value of their project.

Vizcachitas is a complex geological system, and its history has clouded the views of many investors. Its evolution is coming at a time when the copper market is about to undergo a fundamental turnaround. This report is intended to summarize these complex matters – the project and the copper market. It then looks at previous transactions and compares the Los Andes project to the other projects now available to the industry.

## GEOLOGICAL SETTING

The Vizcachitas deposit is part of a highly productive mineral belt in central Chile and Argentina of Neogene age (23 - 2.5 million years ago). This metallogenic belt includes several world class copper porphyries, including Los Pelambres and El Pachón located 75km north of Vizcachitas, Río Blanco and Los Bronces located 80 km to south of Vizcachitas and El Teniente located 180 km to the south.

Further north, the Neogene metallogenic belt includes world-class epithermal precious metal deposits and copper-gold porphyries in the El Indio-Maricunga belt.



## HISTORY

The Vizcachitas project has been explored for decades, but it was only in the last few years that the property ownership has been consolidated, allowing a comprehensive exploration program. Over the past couple of years, the results from decades of work was comprehensively reviewed, resulting in a greatly improved geological understanding. The recent drill results amply confirm the revised model.

The deposit was first identified over a half century ago, but the lack of high grade veins meant that the property was initially passed over. In the early 1970s, the mining industry began to pay attention to large, disseminated porphyry deposits. At that time, a Chilean businessman and part-time prospector staked the San Jose claim over the core of the prospective area. A Canadian junior funded some work on the project but was unable to raise money to continue the work.

In Chile, as in the rest of the world at that time, the oil companies made a foray into mining. Compania Petroleos de Chile (Copec) optioned the property in 1981. Over the next couple of years, they confirmed the presence of a large copper porphyry system, but they dropped the option when they returned to their core oil business.

Major gold producer Placer Dome optioned the project in 1993. After a quick exploration program that included six drill holes, they made an internal estimate of 300 million tonnes at 0.42% copper. Lacking gold in the system, Placer dropped the option.

In 1995, a junior exploration company – General Minerals – acquired a 51% interest in the core San Jose claim and optioned the surrounding claims. After two years of exploration work, including considerable drilling, they brought in Westmin, a successful mid-tier base metal producer. The next year, Westmin was taken over by Swedish miner Boliden, who wanted Westmin’s operating mines, but promptly dropped the South American exploration project.

By that time, the project had seen 63 holes for 18,000 meters of drilling. That work supported a resource estimate of 645 million tonnes grading 0.45% copper and 0.014% moly. In 1998, Kilborn, a big international consulting firm, conducted an “initial feasibility study”. Using a copper price of \$1.00, the study showed Vizcachitas to be an attractive project.

Just as the Kilborn study was completed, the mining industry went into deep hibernation. The copper price soon fell to \$0.60, the lowest price in real terms in a century. There was no interest in copper exploration or development.

While copper was out of favor, Lumina Copper Corp. was quietly buying deposits. Lumina was led by Ross Beaty, who had bought silver deposits in a prior downturn to create Pan American Silver, now a \$3 billion company. In 2003, Lumina purchased Vizcachitas from General Minerals. However, the package included only a 51% interest in the core claim.

In 2006, Lumina, which had a dozen copper deposits, was split into four companies, with Vizcachitas and two other deposits going to Global Copper Corp. The next year, Vizcachitas was bought by a junior, which changed its name to Los Andes. The cash consideration was a multiple of what Lumina had paid a couple of years earlier, and Global also received a substantial share position and a royalty. Global

The table below includes highlights of the deposits in the region of Vizcachitas.

### Copper Deposits Near Vizcachitas

	Ownership	Status	Total Resources billion tonnes Cu%, Mo%, Ag g/t	Comments
Los Pelambres	Antofagasta 60% Nippon 15% Marubeni 8.75% Mitsui 1.25% Mitsubishi 15%	Production	6.1 0.51 0.016	
El Pachon	Glencore	Feasibility	3.1 0.48 0.1 2.0	Argentina
El Soldado	AngloAmerican 50% Codelco 20% Mitsubishi 20% Mitsui 10%	Production	0.2 0.64	
West Wall	Glencore	Reserves development	1.5 0.50 .008	
Pimenton	Cerro Grande	Production suspended	12.5 g/t gold	Gold deposit in epithermal veins
Los Bronces	AngloAmerican 50% Codelco 20% Mitsubishi 20% Mitsui 10%	Production	6.3 0.45 .001	
Andina / Rio Blanco	Codelco	Production	22.3 0.61	Cluster of deposits; open pit and underground
El Teniente	Codelco	Production	15.2 0.56	Mainly underground

Chile is by far the world’s largest copper producing nation, and hosts six of the ten largest copper mines.

had tried to acquire the other half interest in the core claim, but was unable to strike a deal. Teck soon bought Global for the Relincho deposit, paying C\$425 million, with the Vizcachitas interests spun out to a royalty company.

When Los Andes acquired the project in 2007, no fieldwork had been conducted on Vizcachitas for a decade. Los Andes (under completely different management than the present team) carried out extensive work on the property, including two years of drilling. That work was focused primarily on expanding the deposit outside of the core San Jose claim, in which they only had a half interest.

By mid-2008, they had expanded the resource to over a billion tonnes. According to the technical report:

“The interim sulphide mineral resource estimate at a 0.3% CuEq cutoff is as follows:

Indicated Resources: 515 million tonnes grading 0.39% Cu and 0.011% Mo (0.46% CuEq )

Contains 4.43 billion pounds copper and 125 million lbs molybdenum;

Inferred Resources:

572 million tonnes grading 0.34% Cu and 0.012% Mo (0.41% CuEq)

Contains 4.29 billion lbs copper and 151 million lbs molybdenum.”

The Global Financial Crisis of 2008 caused Los Andes, like every junior mining company, to slash their exploration program. They put drilling on hold and turned the focus to lower cost items, including metallurgical testing and engineering studies and also began the environmental work.

In September 2010, Los Andes reached an agreement with Turnbrook, the owner of the 49% interest in the San Jose claim.

Turnbrook received 35 million shares and 13 million warrants of Los Andes. Turnbrook and associates also invested \$2.55 million cash for an additional 17 million shares. Turnbrook later exercised the warrants, made additional cash investments, purchased shares from other parties and vended a hydroelectric project into Los Andes, with the result that the private company now holds 58.7% of the shares of Los Andes. The public company owns 100% of the property, subject to a royalty on the San Jose concession of 0.51 % for production from an underground operation and 1.02 % from an open pit operation. The other concessions that were held before December 2010 have an NSR of 1 % for production from an underground operation and 2 % from an open pit operation.

Turnbrook was (and still is) headed by Eduardo Covarrubias, whose father had originally staked the claim. Eduardo was appointed president, CEO and director of Los Andes. With a background in investment banking and considerable experience in the mining industry, Eduardo was well suited to lead the company. He assembled an exceptional management and technical team.

## MANAGEMENT

The Los Andes management and geological team has a tremendous depth and breadth of mining industry experience. That high-powered team has dramatically improved a project that had been explored for decades by a variety of companies.

**Antony Amberg, President and CEO**, is a geologist with 30 years of experience with major and junior mining companies. A geology graduate of the Royal School of Mines, London with a M.Sc. from University College, London, Tony began his career with Anglo American in South Africa and later worked with Bema Gold on the Refugio project in Chile before joining Rio Tinto where he worked on and managed Chilean exploration programs for the major. In 1996, he joined Kazakhstan Minerals Corporation in Kazakhstan, setting up and managing the drilling and resource estimation for JORC compliant feasibility studies on three large projects that are now operating mines. In 2001, he returned to Chile to start a geological consulting firm whose clients included Rio Tinto, Barrick, Codelco, Anglo American, Pan Pacific Copper and various junior mining companies. He joined Los Andes Copper in 2012 as Chief Geologist and is now CEO.



The author on site with Director Eduardo Covarrubias (left) and CEO Tony Amberg (right).

**Klaus Zeitler, Director and Chairman**, financed, built and managed base metal and gold mines worldwide (Europe, Africa, North America, South America, Pacific) with a total investment value of \$4 billion. With a PhD in economic planning, Dr. Zeitler was a managing director of Metallgesellschaft AG, a German metals conglomerate. He founded and was CEO of Metall Mining, later Inmet, a Toronto Stock Exchange listed company with assets of over \$1 billion. He was a director of Teck and Senior Vice President responsible for the exploration and development of mines in Peru, Mexico and the USA. Since his retirement from Teck, Dr. Zeitler has been actively involved as a director in various junior base and precious metal companies and is President of Chilean copper producer Amerigo.

**Eduardo Covarrubias, Director**, was a banker with the Chase Manhattan Bank for almost a decade, covering the mining sector in Chile. He was based in New York and Santiago and his responsibilities included project financing, structured finance and merger and acquisition transactions. He holds a degree in chemical and industrial engineering and a Master of Science in Management from the Massachusetts Institute of Technology (MIT), Sloan School of Management. Eduardo joined Los Andes after his family's interest in a portion of the Vizcachas project was vended into the company in 2010, initially as CEO.

**Gonzalo Delaveau, Director**, is a highly regarded lawyer in Chile and is also a member of the International Bar Association and the American Bar Association. He has been professor of Modern Contracts and of Regulated Markets in postgraduate programs at distinguished Chilean universities. He has specialized in complex and innovative corporate transactions, finance and trade, both in Chile and abroad, and in the development of projects related to energy, mining, natural resources and public concessions.

**Francis O'Kelly, Director**, is an independent financial and technical consultant based in Santiago Chile. He is a graduate of the Royal School of Mines, London and worked in metalliferous mining throughout the Americas for Exxon, Anaconda and Rosario Mining Co. He also has served as an officer of JP Morgan and a partner of Elders Finance and acted in the capacity of a director of Glamis Gold, Alamos Gold, Northgate, Campbell Mines and Rayrock Resources.

**Francisco Covarrubias, Director**, is an entrepreneur and founder and CEO of a Chilean transportation services company. He holds an engineering degree and an MBA from the University of Melbourne. He worked with the Australia Trade Commission expanding and promoting Australian business interests in Chile. He then worked with Acfin, the largest master servicer for asset-backed securities in Chile and a leading player in the Mexican market.

**Paul Miquel, Director**, has been working in international investment banking since 1990. He holds degrees in mathematics and economics and has been Country Head for Chile, Peru and Colombia for Societe Generale, Director for Sudameris (Intesa BCI Group), and Country Head for Venezuela and Chile for BNP Paribas. During the last 15 years, he has been working in structuring, negotiating and distributing some of the major transactions in the energy and mining sectors in South America, for multinational and local groups and governments.

**Aurora Davidson, Chief Financial Officer**, has over 20 years of experience in financial and general business management, having assisted private and public companies in the roles of Chief Financial Officer, Vice-president, Finance and Corporate Controller within the mineral exploration and high technology sectors. She is a Certified General Accountant, based in Vancouver.

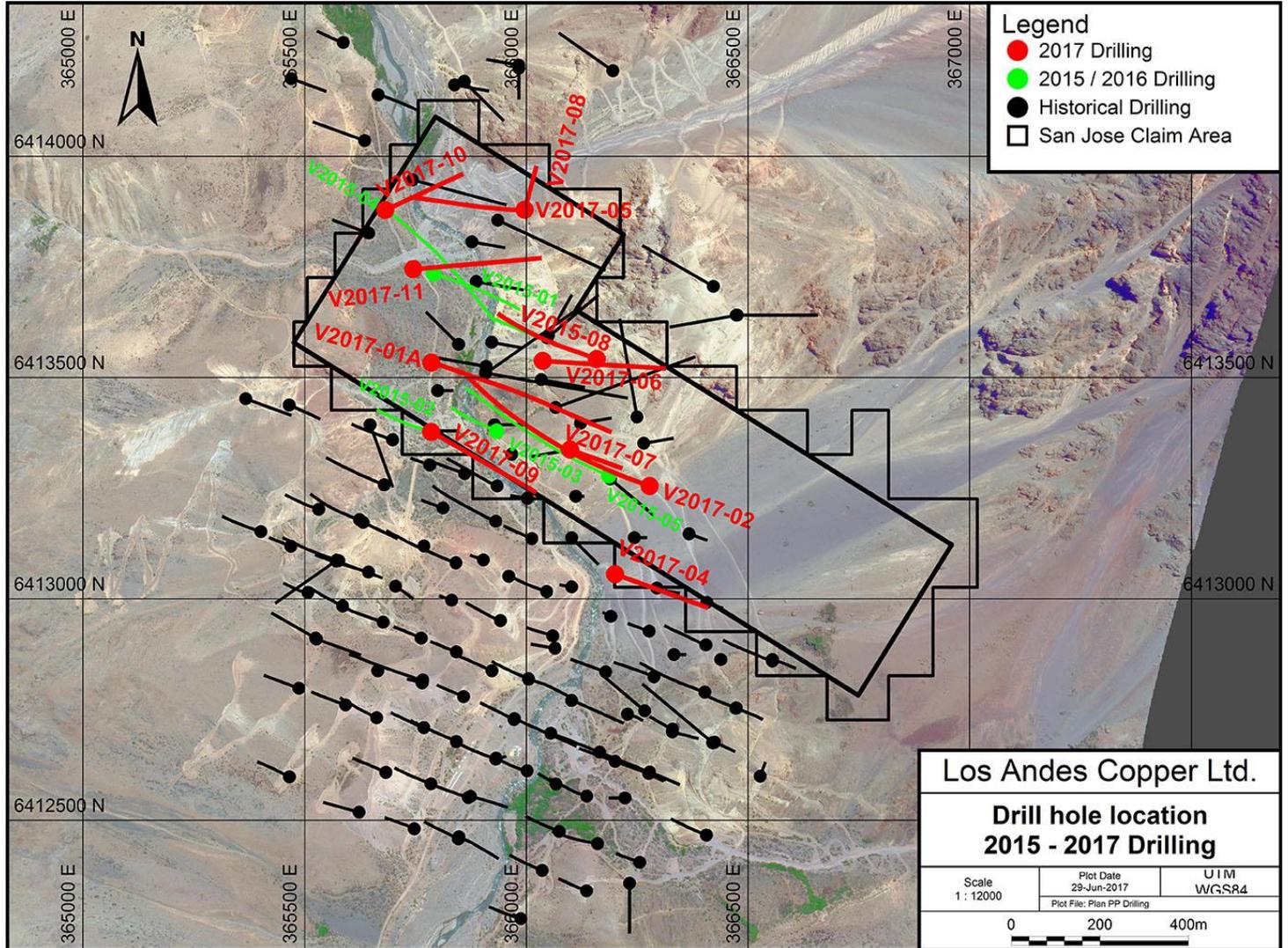
**Pedro Loch, Controller**, has over 20 years of experience in senior financial positions with multinational companies in South America. Based in Santiago, he oversees the Chilean transactions for Los Andes.

**Gonzalo Saldias, Geologist Consultant**, has over 35 years of experience working in Chile and internationally, mainly on copper porphyry, epithermal gold-silver and iron-oxide-copper-gold systems. He is totally committed to Los Andes, working at the Vizcachas site. He worked with Placer Dome Latin America, generating and evaluating exploration projects; for Codelco as head of exploration geology for the El Salvador Division, developing the prospective areas near to the mine and he also worked for Northern Resources, Homestake, Utah, Anaconda and as an independent consultant. Before joining Los Andes, he spent seven years with Antofagasta Minerals evaluating copper porphyry projects within Chile, assessing their geological and economical potential. He is regarded as one of the top experts on Chilean porphyry deposits.

## PROJECT GEOLOGY AND EARLY DRILLING

Vizcachitas is a large, multi-phase porphyry system, with an alteration zone spanning 4 square kilometers.

Earlier work on Vizcachitas was hampered, in part, by the ownership situation, with the 51%-owned San Jose claim covering the core of the system.



Most of the earlier drilling at Vizcachitas avoided the San Jose claim, which was initially staked over the core of the system.

Drilling was carried out in three campaigns: during 1993 (Placer Dome), 1996/1997 (General Minerals) and 2007/2008 (Los Andes). Placer and General Minerals drilled generally shallow holes and the latter campaign avoided San Jose. Therefore, the prior work had not properly reflected the potential of this core area nor fully understood the geology.

In spite of the sub-optimal drilling program, the company carried out a preliminary economic assessment (PEA), which was finished in early 2014.

## PRELIMINARY ECONOMIC ASSESSMENT (PEA) OF 2014

The 2014 PEA was based on a resource estimate as it was understood at that time: The drilling had not properly assessed the core zone and the distribution of copper across the various phases was not understood. A revised PEA, incorporating an updated resource estimate and other improvements, will be completed by year-end.

Even though the 2014 PEA will soon be replaced, it is useful to consider that study here because it addressed all the factors involved in developing a mine and concluded that Vizcachitas was technically viable and economically attractive. The updated study, using higher grades, and with various other improvements, will present an even more favorable picture.

The 2014 PEA was based on a resource estimate (at a 0.3% copper-equivalent cut-off) with an indicated resource of 1,038 million tonnes of 0.434% CuEq (0.373% copper and 0.012% molybdenum), containing 8.5 billion pounds of copper and 281 million pounds of molybdenum. An inferred resource of 318 million tonnes graded 0.405% CuEq (0.345% Cu and 0.013% Mo), containing an estimated 2.4 billion pounds of copper and 88 million pounds of molybdenum. That resource estimate was based on a total of 146 drill holes, with 40,383 meters drilled.



Core storage and camp site. This will become part of the mine.

Silver was not considered in the PEA because the earlier drilling did not include systematic assays for the precious metal. Recent drilling has shown consistent silver values of 1 to 2 gram/tonne, which would add a meaningful amount of revenue. Samples from the earlier drilling have been submitted for re-assaying in part to be able to include silver in the updated PEA.

The 2014 PEA evaluated four mining scenarios, feeding a flotation circuit with throughputs of:

44,000 tonnes per day;

88,000 tonnes per day;

176,000 tonnes per day; and

88,000 tonnes per day, with a step-up to a 176,000 tonnes per day.

The 176,000-tonne-per-day case was selected to be the base case as it produced the highest net present value.

That base case would produce an average of 394 million pounds of copper and 10 million pounds of moly per annum. Those figures clearly qualify Vizcachitas as a world-class development project, potentially of interest to even the largest mining companies.

The base case has a life of mine of 28 years, initial capital expenditures of \$2.9-billion, and used flat prices of \$2.75 per pound for copper and \$13.64 per pound for molybdenum. The moly price has declined from that level, but the difference is easily offset by the current copper price of \$2.90. Inclusion of silver will further boost revenue.

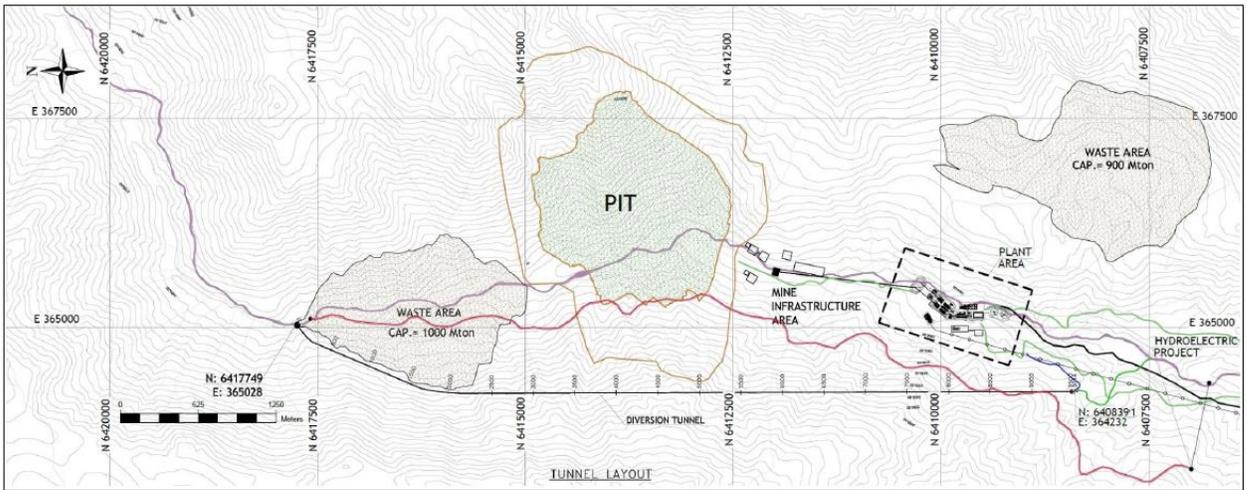
On a pretax basis, the base-case results in a net present value of \$746-million, an internal rate of return of 11.4% and a payback period of 5.9 years. Remember, those results are based on a sub-optimal resource estimate which has been improved with recent drilling.

The PEA noted: “The Vizcachitas Project is sited close to extensive infrastructure systems such as road, rail and port access”. Compared to other large Chilean copper projects, the infrastructure situation is very favorable. It is extremely favorable compared to many other projects around the world.

The deposit is located 46 km by road from the town of Putaendo. Only the last 24 kilometers of road will need upgrading as part of the development program.

Grid power is reasonably close, with a substation 105 km away which would provide enough power for the highest throughput option considered. A closer substation would provide enough power for smaller throughputs.

The project is located in a valley with adequate room for the pit, waste and plant site.



Site layout taken from the 2014 PEA.



Looking south from the deposit area, showing ample room for site development.

The Rocin River flows through the project and the company has secured the rights to produce hydropower. Engineering studies have been completed on the basis of a 29 megawatt run-of-river power facility. That facility would reduce the amount of power to be purchased from the grid.



Rio Rocin at Vizcachitas, which is really a creek at this location.

Development of the open pit mine will require diversion of the river through a 9 km long tunnel. Measuring five meters by five meters, that tunnel will be the same size as a typical mine adit and is more than adequate to handle a 100-year flood event. A similar arrangement was used in developing the nearby Los Pelambres mine.

The company currently owns water rights for a portion of the required water. Other water rights are available in reasonable proximity to the project so that there is no concern about obtaining adequate water rights.

Mining will be via conventional open pit, with the PEA showing a life of mine strip ratio of 1.03 (that is, on average, 1.03 tonnes of waste per tonne of ore). That is a favorable strip ratio for a project of this nature.

Several programs of metallurgical testing have been carried out. Results of the testing support recovery rates in the PEA of 90% for copper and 75% for moly, to produce clean, high-quality concentrates. The concentrates will not attract penalties and will be readily marketable. There is potential to further enhance the metallurgical results.

Tailings will be chemically benign and non-acid generating. The tails will be transported via pipeline to the next valley where ample storage space is available.

Concentrates will be trucked 55 km to a train loading facility and then railed a hundred kilometers to the port of Ventanas for ocean shipment to smelters. That port currently handles concentrates for other producers in the region and with additional storage capacity could handle the Vizcachitas concentrates.

The higher grades evidenced in the recent drilling will greatly benefit the updated PEA. Another huge benefit will come from the much lower energy prices compared to 2014. At the time of the PEA, Chile was suffering from acute electricity shortages and high prices. The PEA price was US\$0.12/kwh. A huge build out in generating capacity in the past three years, including gas-fired, solar and wind, has seen the price fall to a current level of around US\$0.07/kwh.

The 2014 PEA used a price for diesel fuel of US\$1.20/liter. At present, with the lower crude price, diesel is priced at US\$0.60/liter in Chile.

Electricity and diesel are two of the biggest components in the Vizcachitas operating costs (as in most mines), representing 32% of the 2014 mining and processing cost total. At the current prices, the total mining and processing costs would be 14% lower, for a life of mine cost saving of \$2.2 billion. That saving will provide a huge benefit to the project economics.

With regard to permitting: Chile has a well-established mining permit process. The process is rigorous and takes time, but the process recognizes the important role of mining in the national economy. Environmental baseline studies have been underway for a long time and the company has been working with community advisors from an early stage in the project development. The project will require permits for the pre-feasibility drilling and for the mine construction and operation. There is no reason to expect any deviations in the permitting process from other cases of large mine developments in Chile.

## UPDATED GEOLOGICAL MODEL

After completion of the 2014 PEA, management sought ways to improve the project. At the top of the list was the grade. The copper grade varies considerably within the Vizcachitas system. Management reasoned that by better understanding the nature of the higher-grade zones, subsequent drilling could be aimed at the areas with the best prospects of carrying higher grades.

One of the leading experts in Chilean porphyry geology – Gonzalo Saldias – was brought in to lead a program to completely reassess the geological results. Gonzalo's 35 years of experience included in-depth experience with similar deposits as well as years spent reviewing a range of exploration prospects.

The program included relogging drill core from all 146 holes. Gonzalo took a hands-on approach, relogging much of the core himself. The updated drill logs were then incorporated into a comprehensive review of the entire data set.

Earlier work had identified various phases within the porphyry system, but the logging was not comprehensive or accurate enough to really understand the distribution of the mineralization. The colored maps and cross sections that investors see are very different than the situation on the ground. Only trained eyes can detect the subtleties that distinguish the various phases within a porphyry system.

As the work progressed, it became evident that the early diorite porphyry and certain phases of the hydrothermal breccia carried the best grades. That work had identified the higher grade geological units for 1,400 meters north-south and 700 meters east-west and they remained open. The previous drilling had not tested that favorable unit with enough density to incorporate much of it into the resource estimate.

The relogging exercise also showed that the grades of the favorable breccias increase with depth, demonstrating the potential for higher grades below the historic drilling, which was mostly quite shallow.

Recently, more than 1,000 samples from the previous drilling were sent to be re-assayed. The samples were selected at random in order to provide further confirmation of the earlier work. Those samples will also be tested for silver and a suite of other elements. The results should provide a basis for including silver in the resource model and determine if there are other elements of potential value. In addition, values for the other elements will help in understanding the geochemistry as a guide for on-going exploration.

Based on the updated geological model, the 2015-16 and the 2017 drill programs were designed to extend the deposit by testing those areas most likely to contain the favorable host rocks.

## SITE VISIT

The author spent two days on site in late July with Tony Amberg, CEO, Rene Henriquez, senior project geologist and Eduardo Covarrubias, director.

The three-hour drive from the airport at Santiago was mostly on paved highways, with the last 24 km on a well-maintained gravel road. It was mid-winter in Chile, but it felt like spring in Vancouver, with daytime temperatures in the mid to upper teens (Celsius). There was a dusting of snow on the mountains above the project. Overnight, the temperature fell to below freezing.

The camp, at 1,940 meters is the same elevation as the higher parts of Golden, Colorado (a suburb of Denver), and substantially lower than most of the other big Andean copper deposits.

Touring around the project and seeing it from a high vantage point provided a good sense of the layout and logistics. That site visit confirmed that this is a straightforward mine development project in a very favorable location.

One benefit of the favorable location is that the geological work is done entirely on site. That hands-on approach has contributed enormously to the breakthrough in the geological understanding of the project.

Many geologists, working from the comfort of their city offices, rely on computerized drill logs and geological models to study the deposit. At Vizcachitas, the geological team supplements the computerized and paper records with the hard reality of the drill core, which is located only a few steps away. The core has been organized in a way that all the holes are readily available for review.



The drill core from all the holes is readily available for review.

A couple of minutes drive in a pickup puts the geos on the outcrops. While much of the surface is weathered, there is enough fresh outcrop exposed to provide a lot of insight into the subsurface geology.

Tony and the senior geologist provided a comprehensive overview of the project as well as details of the revised geological model. Their descriptions involved computers, paper maps and sections as well as a close look at the drill core from some of the earlier holes and from the recent drilling. Standing on the outcrops provided tremendous insight in terms of understanding the rocks and the extent of the various parts of the system.

Those two days on site helped enormously in comprehending the significance of the updated geological model. Refinements in the geological understanding of this complex system has dramatically changed the outlook for the project.

## RECENT DRILLING

Drilling in 2015-16 encompassed eight holes totaling 3,661 meters with two of those holes abandoned. The six completed holes all provided highly encouraging information, as summarized below:

- Hole 2015-1 extended the higher-grade core zone to the west and showed it remains open to depth; 408 meters at 0.473% CuEq.
- Hole 2015-2 also extended the system to the west, encountering 400 meters at 0.389% CuEq, including 52 meters at 0.665%.
- Hole 2015-3 hit 401 meters of 0.508% CuEq, beginning at 44 meters. The alteration and other geological information indicates that it is still high in the porphyry system.
- Hole 2015-4 stepped out 180 meters to the north, intersecting 470 meters of 0.397 CuEq and ending in mineralization. A 40 meter section near the bottom of the hole returned 0.576%, demonstrating that the grades are improving with depth.
- Hole 2015-5 further tested the northern extension, on the east side of the core zone: 566 meters averaged 0.492% CuEq. Importantly, 120 meters from near the top of bedrock carried 0.595% CuEq, pointing to a shallow high-grade zone that could be part of a starter pit. A deep interval of 52 meters at 0.812% copper, or 0.882% CuEq again demonstrates higher grades at depth.
- Hole 2015-6 went into a barren post-mineral dacite dyke and was abandoned.
- Hole 2015-7 was not able to get through the gravels and was abandoned.
- Hole 2015-8 returned 502 meters of 0.631% copper, or 0.697% CuEq. That hole was drilled in the eastern portion of the core zone, 270 meters north of Hole 2015-5. A 54 meter section from 130 meters carried 1.07% CuEq, supporting the notion of a higher grade shallow zone. The hole ended in mineralization, grading 0.511% CuEq at 725 meters. The hole was deepened in 2017, encountering of 26 meters at 0.62% CuEq, 30 meters at 0.56% CuEq and 28 meters at 0.64% CuEq.

That drilling clearly supported the updated geological model, confirming the presence of a higher-grade zone hosted in the early diorite porphyry and the hydrothermal breccia. By extending the core zone to the north, the geological team demonstrated that the deposit was both larger, and carried a higher average grade than the previous resource estimate.

While investors in general are only beginning to take notice of the “new” Los Andes, one investor group is paying close attention: Resource Capital Funds (“RCF”). Resource Capital Funds is a group of commonly managed private equity funds, established in 1998 with a mining sector specific investment mandate spanning all hard mineral commodities and geographic regions. Resource Capital Fund VI L.P. is a part owner of Turnbrook, which now holds 58.7% of Los Andes. Since inception, RCF has supported 166 mining companies, with projects located in 51 countries and across 29 commodities. RCF has a strong team of investment professionals, with wide ranging industry and technical expertise and a demonstrated history of investments in mining globally. Their latest C\$8 million investment came after a site visit by part of the RCF technical team.

The recently completed 2017 drill program added another 11 holes, further confirming the geological model.

- Hole 2017-1 was drilled in the southwestern part of the central core and encountered 302 meters, from 79 meters, of 0.59% CuEq, supporting the potential for a shallow starter pit.
- Hole 2017-2 was drilled to test the vertical extent of the mineralization in 2015-5, and encountered good grades 200 meters below 2015-5. It returned 5 mineralized intervals:
  - o 22 meters at 0.57% CuEq
  - o 54 meters of 0.60% CuEq.
  - o 16 meters at 0.58% CuEq.
  - o 26 meters at 0.55% CuEq.
  - o 88 meters at 0.72% CuEq.
- Hole 2017-3 was abandoned.
- Hole 2017-4, From a downhole depth of 92 meters, intersected 90 meters at 0.56% CuEq and from a downhole depth of 142 meters, the drill hole intersected 30 meter at 0.65% CuE. These intersections demonstrating the continuity of the higher grade associated with the hydrothermal breccias near surface and demonstrates that the system is still open to the east.
- Hole 2017-5 was drilled in the northern part of the system, and intersected well mineralized hydrothermal breccias and early diorite porphyry, which supports the northern extension of the well mineralized central core. In the 2014 block model, that northern area was interpreted as either waste or low grade material.

The balance of the results will be available soon.

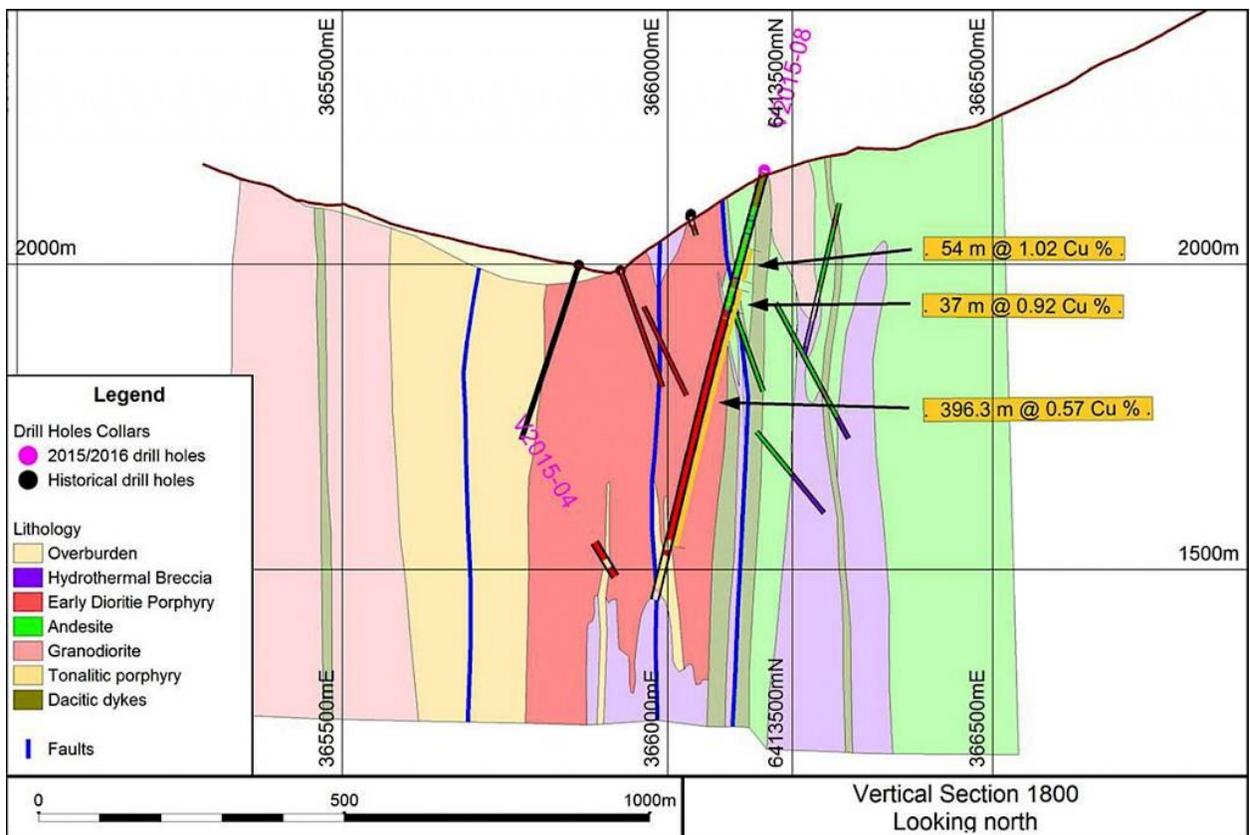
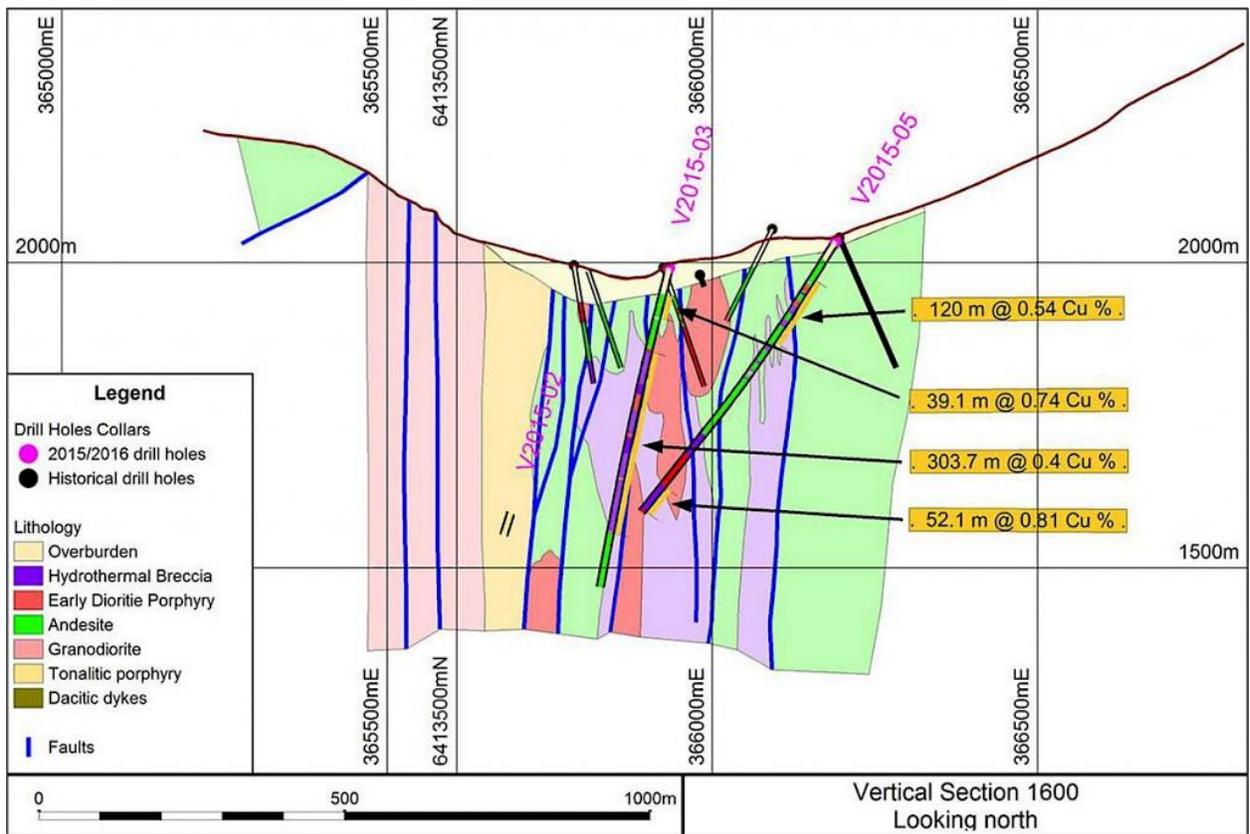
The recently completed drill campaigns verified and built on the re-interpreted geological model in several ways.

First, there is strong confirmation that the higher grades are related to the early diorite phase of the intrusion and to the hydrothermal breccias. Future exploration will target areas most likely to contain those rock types.

That knowledge was applied to direct drilling to the north of the previously drilled zone. The core mineralized zone has now been extended to the north, and remains open in that direction, providing potential to enlarge the total resource at favorable grades. The system also remains open to the east and the west.

The grades improve with depth and the system remains open to depth.

Another important feature that came out of the recent drilling was to identify areas with high grades of primary mineralization. Porphyry deposits typically have supergene zones, where the grade has been enhanced by transport of metal subsequent to the main mineralizing event, usually movement of near surface metal downwards. Finding primary mineralization in the early diorite in excess of 0.6% copper demonstrates that this is a very robust system. That feature has attracted the attention of a couple of the large producers.



Immediately after the resource model has been updated, the engineers will get to work to develop a new mine plan and then an updated PEA. That work is scheduled for completion by year-end.

The update to the project is coming at an ideal time: the copper is emerging from a multi-year bear market and the mining industry and investors are once more looking for development stage projects.

## COPPER AND MOLY MARKET SUMMARIES

After six years of declining prices, the copper market is finally looking up, with the price 25% higher over the past 4 months, and 48% higher than a year ago.

Demand for copper is increasing steadily, and with mines steadily being deleted, the mining industry must constantly build new mines. During that six years of declining prices, the mining industry curtailed exploration and development, creating a gap in the supply pipeline. As a result, demand is now catching up to supply. The copper price is rising with the growing awareness of a coming shortage of supply.

The moly price was hit even harder than copper. It has not yet begun to bounce back, but the same forces of supply and demand will eventually boost the moly price off its two-decade low. Moly is an important by-product at Vizcachitas.

The Appendix includes more details about the copper and moly markets and the mining industry reacting to the looming supply shortage.

The mining industry is now looking for development projects that are ready to move forward. That search is focused squarely on the junior companies with large high-quality projects. As they have done for decades, the majors will buy junior companies to secure the deposits on which they will build new mines.

There is also a large amount of money available for smaller companies to develop and acquire mines. Several highly successful mid-tier mining companies have grown from juniors in recent years, including:

- First Quantum (FM-TSX, C\$10.5 billion market cap);
- Lundin Mining (LUN-TSX, C\$7 billion market cap);
- Hudbay Minerals (HBM-TSX, C\$2.6 billion market cap);
- Ivanhoe Mines (IVN-TSX, C\$3.6 billion market cap);
- OZ Minerals (OZL-ASX, market cap A\$2.5 billion)

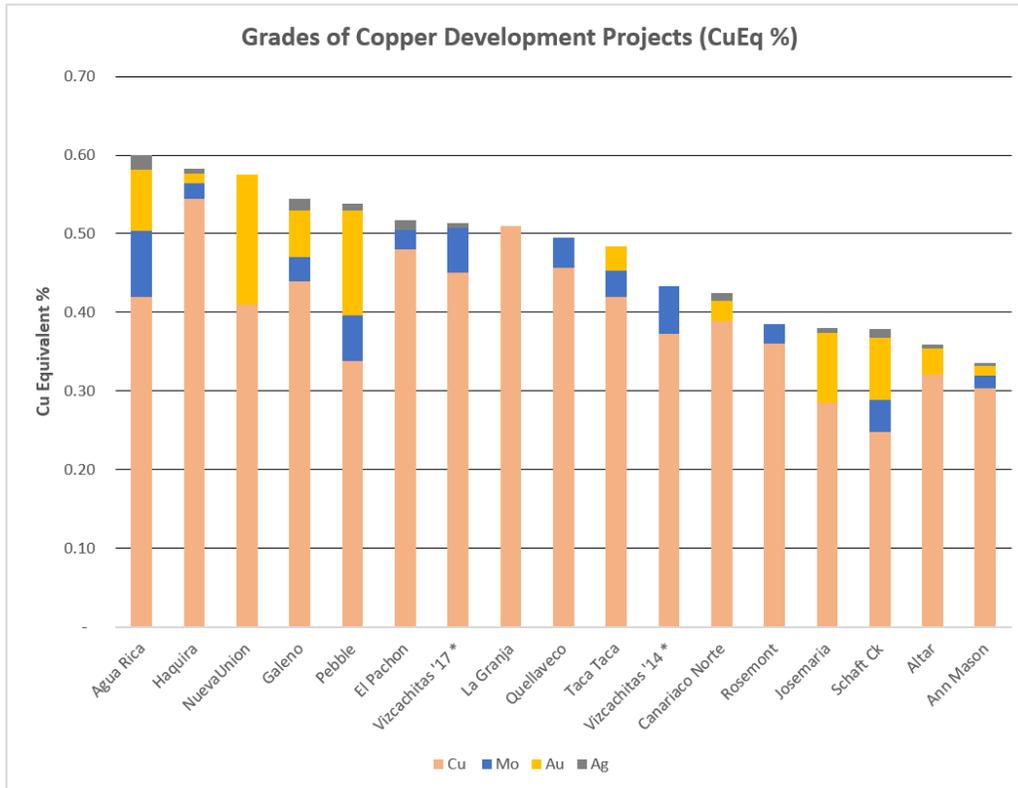
As in past metal cycles, the juniors will see their values rise toward their fundamental values as investors come to recognize the significance of their projects.

## LOS ANDES VALUATION

The PEA completed in 2014 estimated net present values for the project. The after-tax value for the larger throughput case, on a leveraged basis, discounted at 8%, was US\$454 million. That PEA valuation implies a share value of C\$2.31 / share. Various factors, as discussed above (higher copper price; inclusion of silver; greatly reduced diesel and electricity prices; improved grades) point to a substantially higher valuation in the updated study.

Another approach is to look at Vizcachitas in relation to other large copper deposits and to look at the values paid for similar deposits in recent years.

The chart below shows the grades of the plus-billion tonne copper deposits in the Americas with reasonable prospects of being developed in the near future.



\* Important note: The grades used for Vizcachitas '17 are based on the averages of all of the reported intervals from the results reported from the drilling in 2015-17. This is an unconventional way to present the results and at this time there is no basis for projecting those results to a resource. This presentation is intended to recognize that the grades encountered in the drilling that was based on the updated geological model are materially higher than the 2014 estimates. See other notes below.

Copper Development Projects - Highlights			
Project	Owner	Jurisdiction	Notes
Agua Rica	Yamana	Argentina	Grades from SNL, CuEq adjusted for recoveries and payables.
Haquira	First Quantum	Peru	Grades from SNL, CuEq adjusted for recoveries and payables.
NuevaUnion	Teck / Goldcorp	Chile	Grades from SNL, CuEq adjusted for recoveries and payables.
Galeno	China MinMetals	Chile	Grades from SNL, CuEq adjusted for recoveries and payables.
Pebble	Northern Dynasty	Alaska	Grades from SNL, adjusted for recoveries and payables; includes portion expected to be mined from underground.
El Pachon	Glencore	Argentina	Grades from SNL, CuEq adjusted for recoveries and payables.
Vizcachitas '17	Los Andes	Chile	Grades based on the total reported intervals from drilling in 2015-17; CuEq adjusted for recoveries and payables.
La Granja	Rio Tinto	Peru	Grades from SNL, CuEq adjusted for recoveries and payables.
Quellaveco	Anglo/Mitsubishi	Peru	Grades from SNL, CuEq adjusted for recoveries and payables.
Taca Taca	First Quantum	Argentina	Grades from SNL, CuEq adjusted for recoveries and payables.
Vizcachitas '14	Los Andes	Chile	Grades from 2014 PEA, indicted resource; no silver value included.
Canariaco Norte	Candente	Peru	Grades from SNL, CuEq adjusted for recoveries and payables.
Rosemont	HudBay	Nevada	Grades from SNL, CuEq adjusted for recoveries and payables.
Josemaria	NGEx / JOGMEC	Argentina	Grades from SNL, CuEq adjusted for recoveries and payables; does not include Los Helados, which will be developed later as an underground mine.
Schaft Ck	Teck/Copper Fox	Brit. Columbia	Grades from SNL, CuEq adjusted for recoveries and payables.
Altar	Sibnyne	Argentina	Grades from SNL, CuEq adjusted for recoveries and payables.

The deposits in that list host a total of 349 billion pound of contained copper. That sounds like an enormous amount, but all those deposits combined represent just 7.3 years of mine supply, considering a 90% recovery level and the current global mining rate of 42.9 billion pounds per annum.

The copper mining industry must continually develop new mines to maintain production levels, as mines are being depleted and demand continues to grow.

After a period of reduced development due to low prices, the industry is once more looking to develop new mines. Many of the mines that are developed by the major mining companies were purchased from juniors who discovered the deposits, or who took known deposits and advanced them to the point of economic viability. In the list of major copper transactions in the past decade, all but two of the targets are juniors.

Copper Deposit Transactions				
Date	Acquiror	Target	Stage	EV/Resource (US\$/lb)
Apr 2016	Nevsun	Reservoir	Scoping Study	33.9
Aug 2015	Goldcorp	El Morro (30%) (NewGold)	Feasibility	3.6
May 2015	Zijin	50% Kamona (IVN)	Resource Estimate	1.6
Sep 2014	Taseko	Curis	Pre-Feasibility	3.0
Jul 2014	Ma'aden	50% Jabal Sayid (Barrick)	Construction	26.8
Jun 2014	First Quantum	Lumina	Scoping Study	1.1
Apr 2014	MMG-led Consortium	Las Bambas (Glencore)	Construction	22.3
Feb 2014	HudBay	Augusta	Feasibility	6.9
Oct 2012	Cupric Canyon Capital	Hana Mining	Scoping Study	2.1
Jul 2011	Stillwater	Peregrine Metals	Resource Estimate	3.5
Apr 2011	Capstone Mining	Far West Mining	Scoping Study	16.5
Jan 2011	HudBay	Norsemont	Feasibility	8.5
Oct 2010	Equinox Minerals	Citadel	Construction	48.6
Oct 2010	First Quantum	Antares Minerals	Scoping Study	3.3
Oct 2010	Capstone Mining	Pinto	Production	90.2
Sep 2010	Jinchuan Group	Continental Minerals	Feasibility	4.2
Jul 2010	Thompson Creek	Terrane	Construction	4.4
Mar 2010	China Sci-Tech	Chariot Resources	Feasibility	4.2
Jan 2010	Goldcorp	70% El Morro	Feasibility	7.1
Dec 2009	CRCC-Tongling	Corriente Resources	Feasibility	2.0
Nov 2009	First Quantum	Kiwara	Resource Estimate	0.9
Jul 2008	Teck	Global Copper	Feasibility	4.2

#### Notes on Copper Deposit Transactions:

1. There is a wide range of values, reflecting the different stages of the target projects and also the variations in the nature of each project.
2. The low value for the Kiwara transaction reflects the timing of the transaction (post Global Financial Crisis) and the company's note that "the Kalumbila Copper deposit ... represents an early stage opportunity to develop a relatively low-grade but extensive copper resource."
3. The high value for Reservoir's project reflects upside potential factored into the price.

The average value for transactions at the Scoping Study stage (ignoring the Reservoir transaction) was 5.75 US cents per pound of copper resource. Those four targets are broadly similar to Vizcachitas, except that the Los Andes project offers several advantages including location, infrastructure and political regime.

The mining industry will continue to develop new copper mines, with the most attractive deposits being developed first. The factors that determine attractiveness include:

- Size: Larger deposits are preferable to the large mining companies, who are once more in development mode.
- Grade: The deposit must have a grade in line with the capital and operating cost.
- Metallurgy: Difficult metallurgy can kill the economics of a metal deposit, by reducing recoveries and/or increasing processing costs.
- The presence of deleterious elements (such as arsenic) in the concentrate can make it difficult to market the product or result in costly penalties.

- Location: The location can greatly affect development costs and therefore economic viability. Many deposits are on indefinitely hold due to remote locations where infrastructure is not available.
- Politics: It can be difficult to secure financing for projects in unfavorable jurisdictions: corruption, permitting challenges, uncertainties with regard to security of title, environmental opposition.

The Vizcachitas project ranks high on each of those criteria, implying that it should attract a valuation at least in line with previous transactions.

Los Andes has a value per pound of copper equivalent resource (based on the 2014 numbers) of 0.65 US cents per pound. Compared to the average transaction value for projects at the same stage, Los Andes is valued at only 11% of the value paid for similar deposits.

## LOOKING FORWARD

Assays for the recent drilling will come in over the next few weeks. The results are being incorporated into the data base and a revised resource estimate is scheduled for October. That drilling has extended the deposit into areas with higher grades. The updated resource estimate will show a larger total resource and a higher average grade. In addition, samples from the earlier drilling are being re-assayed for a range of metals, including silver. As a result, silver will be included in the resource for the first time. Based on the 1 to 2 grams per tonne seen in the drilling from the last 2 years, there could be in the order of 50 million ounces of silver in the deposit, which would be a nice bonus.

The updated resource will be incorporated into an updated preliminary economic assessment, which is expected early in the new year. Incorporating the improved resource figures and the huge cost savings from lower electricity and diesel prices, will certainly confirm Vizcachitas as a very attractive development project.

The higher-grade material that was encountered near surface has renewed the prospect that this could be developed initially at a smaller scale, and thereby much lower capex. That option will also be evaluated in the updated PEA.

Management plans to move directly into a prefeasibility study early in the new year. That work will require further funding, which should come at a substantially higher share price. During the year, they will also advance the permitting process.

With one of the top resource investment funds as a major shareholder, Los Andes is in an excellent position to continue to advance the project and to develop a mid-level mine.

There are many reasons to expect the share price to move higher over the coming weeks:

1. Results from the drilling are solidly confirming a revised geological model that includes a substantially larger zone of higher grade material.
2. The upcoming resource estimate will confirm a larger and higher grade resource.
3. A PEA by year end will demonstrate project economics that are greatly improved from the earlier study.
4. The copper market has turned around and investors are once more looking at copper projects.
5. The mining industry is once more looking for high quality development-stage copper deposits. Vizcachitas sits high on the list of available prospects.
6. The value of the company at this time is only 11% of the value implied by transactions involving similar deposits. There is enormous scope for the share price to move up towards that implied value.
7. Management is committed to doing what it takes to ensure that investors, and the mining industry, recognize the value of their Chilean copper deposit.

## SUMMARY AND CONCLUSIONS

Vizcachitas has been explored for decades, but it has only been in the past two years that the geology has been properly understood. The last two rounds of drilling, the latter of which has just finished, have demonstrated conclusively the validity of the new geological understanding.

Investor and industry perceptions of the project in the past have been influenced by the earlier and incorrect geological model.

The recent drilling has extended the higher-grade core zone, thereby adding high grades tonnes to the total resource. That will add tonnes and will also improve the overall average grade. That drilling has also identified near-surface zones with higher grades that could be “starter pits”.

High grade starter pits, more total tonnes and a higher average grade will have a huge impact on the project economics in the soon-to-be-updated PEA.

Dramatically lower diesel and electricity prices compared to the figures in the 2014 PEA will also improve the project economics.

After a period of underinvestment in the copper industry, demand is overtaking supply and the copper price has increased substantially over the past couple of months. The fundamental supply / demand picture for copper supports further increases in price and the need for mine development.

The mining industry is once more getting into expansion mode and will be looking to the juniors to supply copper projects on which to build mines.

Vizcachitas is among the largest copper deposits available. The improved grade, favorable economics, and the long list of other positive attributes such as infrastructure place this deposit near the top of the list of development-stage copper deposits.

At the current share price, Los Andes is valued at only 0.65 US cents per pound of total copper resource. Transactions with similar deposits in recent years had an average value per pound of 5.75 US cents per pound. There is every reason to believe that Los Andes will be valued on the same basis as those previous transactions.

The improving copper market and an enhanced investor awareness campaign will help to boost the Los Andes share price toward the fundamental value implied by the average transaction value.

## APPENDICES

### COPPER MARKET OUTLOOK

Copper is the most important base metal, with an annual turnover last year of \$130 billion. After six years of price declines, the copper market is once more looking up, with a surplus turning into a deficit.

After a long hiatus in mine building, the improved outlook for copper means that the mining industry is once more on the hunt for development projects. Junior companies with high quality development projects are getting the attention of the majors.

In trying to understand the copper market, many analysts focus on short term factors, like strikes at major producers, or the impact of a new product, or recent economic reports. That approach highlights what are really just blips on the longer-term trends.



Another approach to understanding the copper market is to look at the broader factors of supply and demand in order to understand the longer-term trends.

Last year, industries around the world consumed 51.7 billion pounds of copper in the production of a vast array of consumer and industrial products. Copper is used in electrical wiring and electronics and it is also very important in construction (for example, for plumbing and fixtures) and it has a myriad of other applications.

## Global Copper Supply and Demand

	2013	2014	2015	2016	2016 (billion pounds)
	(000 tonnes)				
<b>Production from Mines</b>	17,257	18,565	18,924	19,445	42.9
<b>Recycled Production</b>	3,803	3,915	3,945	3,864	8.5
<b>Total Refined Production</b>	21,060	22,480	22,869	23,309	51.4
<b>Global Copper Usage</b>	21,396	22,880	23,041	23,429	51.7
<b>Change in Refined Copper Stocks</b>	-336	-400	-172	-120	-0.3

Since 1960, the compound annual growth rate for copper consumption has averaged 2.9%. Over the past decade, the CAGR has increased to 3.3%.

That growth in metal consumption is driven by many factors, which can be summarized as:

- Population growth;
- Increasing usage intensity per capita: That is, on average, each person uses more copper each year.

The increasing usage intensity results from:

- On-going urbanization, as

more people each year move to cities, resulting in a massive building boom;

- Those new city dwellers then join the consumer class;
- Consumerism around the world is intensifying.

Those factors have supported a growth rate in copper consumption of 3.3% for the past decade. There is every reason to believe that basic growth rate will at least continue.

There is another factor which could accelerate growth in copper demand. The evolution toward green energy and electric cars will further boost copper consumption: green energy and electric cars require considerably more copper per unit than conventional equivalents. For example, a typical gas or diesel car uses 55 pounds of copper. An electric vehicle uses 165 pounds.

Last year, there were 160,000 electric vehicles sold in the US. That figure is expected to grow into the millions over the next few years, with some analysts predicting a third of the market will soon be EVs.

Electric vehicles are even more popular in the world's largest auto market – China. Last year, total vehicle sales in China hit 28 million units, with 282,000 of those being EVs. The Chinese government has mandated that EVs should make up 4% of the auto market by 2021, implying 1.1 million EVs per annum in China.

Even without a rising contribution from green energy and electric vehicles, copper consumption has been growing at 3.3% for the past decade, and there is nothing to suggest that pace will slow. If the forecasts for EVs play out, then copper consumption would grow even faster.

On the supply side, recycled copper meets about 16% of demand. That figure has ranged from 10% to 20% over the past half century and tends to increase with higher prices, reaching 20% when the copper price was \$4.50. The balance of the copper supply is mined.

To match the growth in demand for copper, the mining industry must increase productive capacity by an average of more than 3% each year.

In addition, the mining industry must continually replace depleting mines just to stay level.

Some copper mines have produced for over 50 years, while others last only a few years. A reasonable estimate of the average life of a copper mine would be 25 years. On that basis, 4% of the entire copper mining industry must be replaced each and every year to simply maintain the production level.

Adding that 4% average replacement rate to the 3% CAGR for copper consumption means that the mining industry, on average, must develop new mines equivalent to 7% of the total copper mining industry each year.

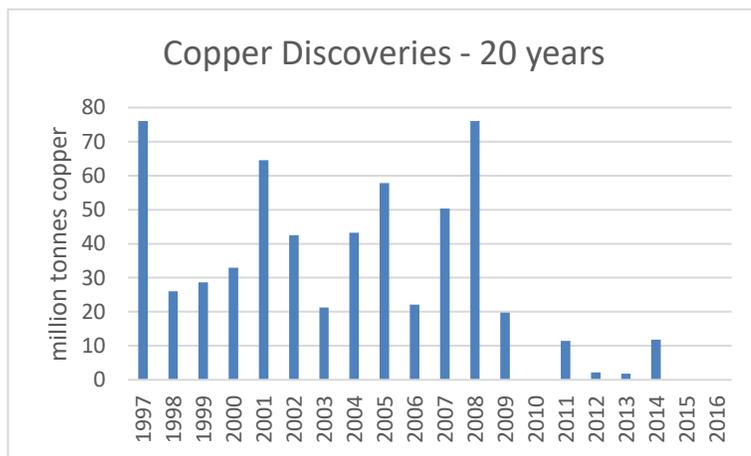
To put that into perspective:

- Last year, copper mines produced 42.9 billion pounds of copper.
- On average, 7% of that amount, or 3 billion pounds of new production capacity must be added each year.
- That amount of new production would require the development of 7 mines like Los Andes' Vizcachitas each year.\*

\*Vizcachitas will be a large mine. The 2014 preliminary economic assessment was based on a mining rate of 176,000 tonnes per day to produce 394 million pounds of copper per year.

The mining industry is notoriously cyclical. Typically, several mines come into production following a period of high metal prices. We saw that over the past decade, with a spurt of mine building following the sharp run-up in the copper price beginning in 2003. The monster Oyo Tolgoi mine in Mongolia and several large Chinese-funded projects in Africa and Latin America boosted productive capacity above demand, creating a surplus and driving down the price.

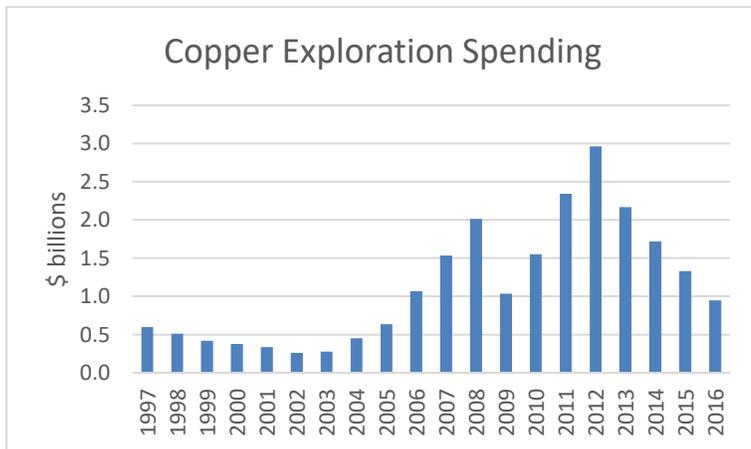
The other side of that cycle is that mine development is curtailed when metal prices are low, so that demand ultimately exceeds supply. It takes several years to bring a new mine into production. There's an old saying in the mining industry: The cure for low metal prices is ... low metal prices.



Codelco, the Chilean government-owned company that is the world's largest copper producer, last year slashed its capital budget through 2020 from \$25 billion to \$18 billion. The original figure was intended to maintain the production level.

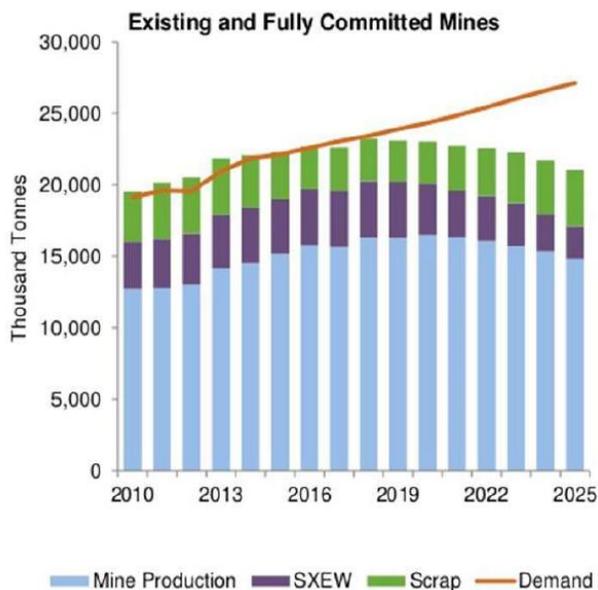
Across the industry, low metal prices led to reduced capital spending over the past few years, and we are now beginning to see the inevitable results as the copper price begins to move upward. After a long period of reduced mine building, the major miners are once more looking at developing mines.

At a high level, it appears that there is a large supply of copper deposits in the development pipeline. Indeed, the industry has discovered 142 new copper deposits over the past 20 years, hosting a metal endowment of 588 million tonnes of contained copper metal.



During that time, mines produced 306 million tonnes. Of the unmined discoveries, a portion represents reserves of the mining companies which will be mined over the coming decades.

Many of the deposits that show up on that list will not be developed until the copper price has risen well above the current level. Some of those deposits will never be developed, for a variety of reasons including: environmental constraints, technical challenges, political problems, lack of infrastructure and a host of other reasons.



That chart also shows that the mining industry has not replaced copper mined with new discoveries for almost a decade. There is a looming gap in the supply pipeline.

That lack of discoveries was not for lack of trying. In fact, the mining industry has spent more money exploring for copper in the past decade than at any time in history.

The huge ramp-up in exploration spending coincided with the worst discovery success in decades. The industry is getting better at looking for new deposits: Exploration techniques have improved dramatically. The challenge is that new deposits are getting harder and harder to find. The big deposits that were sticking out of the ground have long since been found.

The result of steadily growing demand in the face of constrained supply growth is a looming supply shortage, according to figures from Wood Mackenzie, a leading mining industry analytics group.

In fact, an actual deficit is unlikely: Rather, tight supplies will lead to higher prices, which will spur mine development.

The mining industry has already begun to take action. Juniors with large, high quality deposits are once more getting visits from the majors. In order to replace depleted mines and match growing demand, the mining industry will be buying development projects from the juniors.

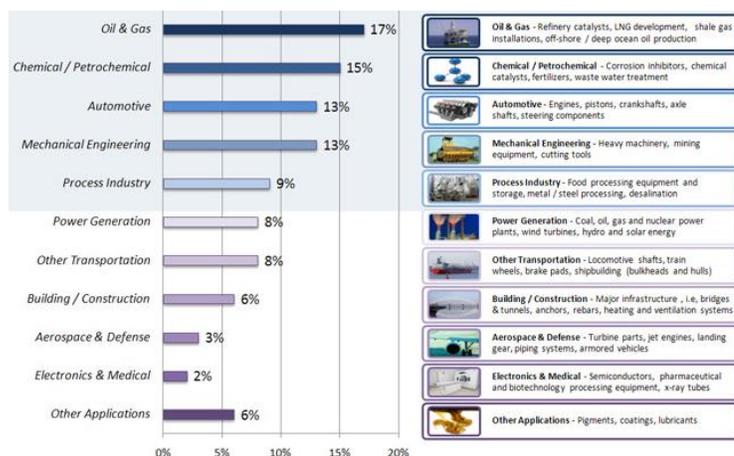
## MOLYBDENUM MARKET OUTLOOK

Molybdenum, or “moly”, has unique physical and chemical properties that make it extremely useful in a variety of applications, most notably steel alloys. Moly is added to steels to improve strength, toughness, hardenability and weldability for numerous applications in the automotive, shipbuilding, construction, mining, chemical, oil & gas and energy generation industries.

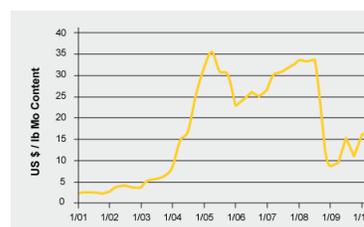
Moly’s extremely high melting point of 4,730 degrees Fahrenheit makes it useful in alloys for applications like jet engines, gas turbines and other superalloy applications. Moly is also used to make tool steels – extremely hard steels used for cutting and shaping.

Moly adds a high degree of corrosion resistance to steel alloys. It is an essential component in stainless steel. It is also an important element in steel alloys used in oil and gas pipelines, offshore pipelines and other applications where it is highly important that the material withstands leakage for a very long time.

Molybdenum Uses by Industry



Historic Molybdenum Price 2001-10



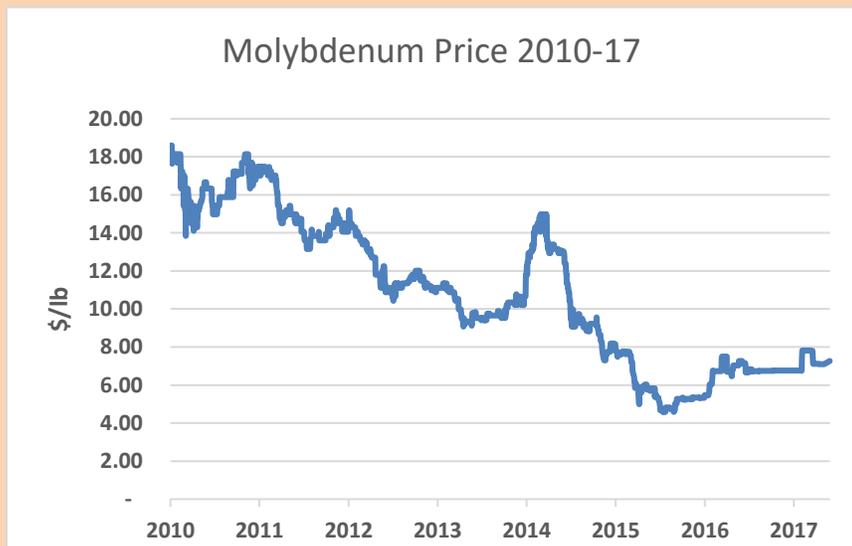
In total, about three quarters of the moly consumed each year is used in various steel alloys.

Moly is also important in a wide range of other applications, including high performance lubricants, paints, inks, plastic and rubber products and smoke suppressants. Another big role for moly is in petroleum refining and processing, particularly as a catalyst in the process to remove sulphur from gasoline and

diesel fuels. Producing low sulphur motor fuels is increasingly important, for a couple of reasons: first, the sulphur contributes to atmospheric haze and smog; secondly, the sulphur interferes with the functioning of the autocatalytic converters which remove other harmful materials from car exhaust.

In 2016, global consumption of moly totaled 512 million pounds, up slightly from the prior year, in spite of weaker demand from the oil and gas industry. Demand for moly across all applications is expected to continue to grow in the coming years.

Production last year was 503 million pounds, down from 517 million pounds the prior year. Moly is produced almost entirely as a byproduct of other metals, in particular copper and tungsten.



As a byproduct, production of moly is not directly related to price: A rising price does not lead directly to higher production. As a result, the moly price is highly volatile. Over the past 15 years, moly went from \$3 a pound to \$35, then back to \$4. The price is just beginning a recovery from levels not seen since 2003. It is difficult to forecast the moly price, but it seems there is a lot more upside potential than downside risk from the current level.

## About the Author

Lawrence Roulston is a mining analyst with over 35 years of diverse hands-on experience. He recently founded WestBay Capital Advisors, providing business advisory and capital markets expertise to the junior and mid-tier sectors of the mining industry. From 2014-2016 Lawrence was President of Quintana Resources Capital, which provided resource advisory services for US private investors. Before Quintana, he was a mining analyst and consultant, as well as the editor of "Resource Opportunities", an independent investment publication focused on the mining industry. Prior to this, Lawrence was an analyst or executive with various companies in the resources industry, both majors and juniors. He has graduate-level training in business and holds a B.Sc. in geology.

Lawrence has travelled extensively to examine mines and mineral properties, having visited more than 40 countries and been on the ground on hundreds of project



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