It was named after the company's first president, Mr Barton Sewell, in 1915.

Our guide Rómolo, a former Codelco employee, described the city as paradise; free rent, water, electricity, and maintenance was provided to the employees. It had a fire department, social club, movie theater, bowling alley, school and hospital. The colourful timber houses were built along the main street, a steep staircase running up from the train station. The city contains no roads due to the steep terrain; it's only connection to the outside world was a train. Due to the triangular shape of the city, built up a mountain, it resembled a Christmas tree at night.

Over 80,000 people were born in Sewell, and the city contained a population of 15000 at its peak. In 1971, the Chilean government purchased 51% of the mine from the owner at the time, Kennecott. Shortly afterwards, the final 49% was nationalized and the mine was given to Codelco. Sewell was closed in 1978 due to lower copper prices and the prohibitively high cost of $32 million per year to maintain. It was made a national monument in 1998, and became a UNESCO World Heritage site in 2006.

We were fortunate to have a visit, as most tourists find it expensive, inconvenient, or otherwise difficult to obtain a tour due to the still operating mine nearby and the remote location of the town. We were extra fortunate to have an amazing tour guide – Rómolo – a gifted public speaker and knowledgeable gentleman.

2.4 Andina

On our last day of mine tours we had the pleasure to visit another large Codelco mine, Minera Andina. Located roughly 60 km directly north east of Santiago (over 100 km by road), it benefits from large deposits of copper as well as low grade molybdenum which is now being extracted at its own surface plant. Most workers are on a camp schedule and during shift time they are housed at the Hilton Camp located at 3,070 meters elevation. Mining is performed both on surface and underground, using a block cave. Copper is sent through bulk sulphide flotation, to get a copper concentrate and molybdenum product.
2.4.1 Mining Process

Andina has two main mining methods; open pit and underground. The open pit is located between 4000 to 4200 meters and is directly south of the concentrator plant. Using conventional truck and shovel methods they output 31,000 tonnes of ore per day. This ore is dropped off at an ore pass which sends it directly to an underground primary crusher. After crushing it is transported via underground conveyors into the milling and concentrator plant.

The underground mine uses typical block caving techniques and manage to output 43,000 tonnes per day of ore. It is located between 3000 to 3600 meters. The ore is taken to the North and South primary crushing plants where it is passed through parallel cone crushers, followed by a gyratory crusher then into a series of tertiary crushing plants before milling. The milling process is all performed underground after an avalanche destroyed their old facilities. It consists of bulk sulphide flotation, processing 74,000 tonnes per day of ore at a grade of 1.074% Cu and 0.019% Mo. Through a series of crushing, grinding and flotation a product of 29.5% Copper and 0.42% Molybdenum comes out of the end of the circuit with an overall recovery of 87.9% of the copper and 71% of the molybdenum. A picture of the flotation flowsheet, including recoveries and grades and several points, can be seen below. As can be expected with these types of mining methods, the block caving has caused severe subsidence near the highwall shared with the neighbouring mine owned by Anglo American but we are told it is now under control.
The wine industry was brought to Chile in the 16\textsuperscript{th} century by the Spanish. Under Spanish rule, vineyards had many restrictions placed on them to encourage the Chileans to purchase most of their wine from Spain. Despite these restrictions, the Chileans still bought locally as the imported wine was often oxidized and vinegary. Despite being politically tied to Spain, Chilean wine was heavily influenced by the French. In the mid-19\textsuperscript{th} century there was an outbreak of grape phylloxera, an aphid that destroyed many of the vineyards in Europe. Fortunately due to Chile’s isolation from the outbreak, the Chilean wine industry took off and many prominent winemakers made the move, bringing with them their expertise.

Vina Errazuriz was founded in 1870 in the Aconcagua Valley. Don Maximiano Errazuriz, who founded the winery, brought grapes over from France. The winery is now owned by Eduardo Chadwick who is the fifth generation of the Errazuriz family. The winery produces a wide variety of wines and involves the major vine growing styles. We also visited Vina San Esteban, which is a smaller wine producer. There we learned the processes of wine tasting.

2.5 Wineries
3.0 NORTHERN CHILE

Northern Chile is a region of incredible mining activity and was the major centre for our visit to many world class operations. To get to this region of the country we took a 2 hour flight from Santiago to the city of Atofagasta.

Antofagasta is Chile’s 4th largest city and it’s economy relies heavily upon the region’s mining and extraction industries. Visiting Antofagasta was an interesting experience, for much of the city has been constructed at a time when there was less money available. Thus when driving or walking through much of the city we experienced a place that, in contrast to Canadian cities or even Santiago, was much worse off. Although a poorer city, evidence of the new money being infused was found a block away from the hotel where there was a brand new, North American style mall which was a hotbed of community activity and showed promise for the future of Antofagasta and Northern Chile.

3.1 Escondida

On the 2008 research trip to Chile, the UBC Mining Engineering Research Group had the opportunity to visit one of the world’s premier open pit mines, Minera Escondida. Located 170km southeast of Antofagasta, Escondida is the world’s largest copper producer, accounting for approximately 8% of the global copper production and 23% of the total Chilean copper production. The operation is owned by multiple companies with BHP Billiton owning the largest percentage, 57.5%. The breakdown of the ownership structure can be found in Figure 4.
Operations at Escondida consist of two conventional open pits producing both sulphide and oxide ores, Escondida (main) and Escondida Norte (located 5km from the main open pit). The Escondida Norte pit began producing ore in 2005. Ore from the Escondida pit is trucked to in-pit primary crushers which is then sent via overland conveyor to the Los Colorados concentrator plant. This plant is capable of milling over 130,000 tonnes per day. Combined with the Laguna Seca concentrator, the total milling capacity of Minera Escondida is over 300,000 tonnes per day. Oxide ore is taken to either a ROM heap leach pad or a recently installed bioleaching process. The impregnated solution is processed with SX-EW processes. The concentrate is sent by two pipelines to a filter plant at a port near Antofagasta and then the dried copper concentrate is shipped to smelters primarily in Asia. In 2006, Minera Escondida produced 1.3M metric tonnes of fine copper.

With a world class deposit comes world class financials. Escondida averages roughly US$35M dollars PER DAY with an average copper recovery of 90%. However this allows Escondida to invest heavily in the community. To date Escondida has invested over US$5 Billion dollars in direct investments in Chile and as a result, the mine enjoys a very good relationship with communities in the surrounding areas. As well, Minera Escondida’s 2006 exports made up 10% of Chile’s total export revenues.