

The Illapel Copper-Silver Project

Coquimbo, Chile

- Technical Report NI 43-101 -



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Effective Date: April 30, 2024

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Section 1.0 Summary

The Optionors, Windows Minerals SCM and SLM Rio 27 de Farellon Sanchez, both Chilean companies, have agreed to grant an exclusive option to Vortex Metals Corp., a Canadian corporation (TSX:VMS) to acquire a sixty percent (60%) interest in the Property (the "First Option"); and upon exercise in full, the Optionors have agreed to grant an exclusive option to Vortex to acquire a further twenty percent (20%) interest, for a total of 80% in the entity that will be incorporated upon exercise of the First Option. A series of cash and share payments will occur along with exploration expenditures. Upon vesting through the second option, a Joint Venture and management structure will be established allowing the JV to move forward through Final Feasibility, financing and development. In addition to the carried 20% carried interest, the Optionor will retain a 2.5% NSR. The option agreement provides a right of first refusal (ROFR) on the Rio 27 Mine and processing facility.

The property consists of 33 Exploitation concessions; the total area of the 'Property' is 5,970 Hectares. Within the property, the operating subsidiary of Ventana Mineral Group, SLM Rio 27, has reserved a portion of the Rio 27 concession to continue mining operations at their currently active mine and processing facility on the outskirts of Illapel. This is referred to as the Brownfield Project and is subject to a First Right of Refusal between Windows Minerals SCM, SLM Rio 27 and Vortex Metals Inc. The government of Chile permits SLM Rio 27 to extract up to 3,000 tonnes per month within an expedited permit designed to support 'small miners' in Chile. The Rio 27 mine has been in production since 2010 with its near-site processing plant and has produced approximately 400,000 tonnes of mineralized material with an average grade of 1.39% Cu.

The deposits, exemplified by the active Rio 27 mine, are strata-bound copper deposits with subordinate silver, and are known as 'Chilean Manto-type' copper deposits. These unique deposits occur along the Coastal Cordillera of Northern Chile (north of Santiago, <34°S) and form an economically important cupriferous metallogenic belt. The largest Cu-(Ag) manto-type deposit hosted in Lower Cretaceous rocks is El Soldado, located about 70 km south of Illapel, in the Coastal Cordillera of central Chile, with a past production + reserves of 200 mt at 1.35% Cu.

The origin of these deposits is distinct and requires the spatial and temporal overlap of several regional events including back-arc basin development, hydrocarbon mobilization, extensional tectonics, primary and secondary permeability and regional to local thermal events. In contrast, the younger porphyry and/or IOCG copper deposits developed later, further east into the Andes, are magmatic-hydrothermal in origin, host greater contained copper and can be mined at lower copper grades owing to their large size.

The Illapel project's geology is essentially defined by a pair of north-trending, regional right-lateral wrench faults which traverse a Lower to Upper Cretaceous calc-alkaline volcanic rock sequence intercalated with mostly continental sediments with local limestone, marl and siltstone. The sequence has been intruded by the 100Ma Illapel granodiorite batholith and a variety of dikes including the unique 'ocoite' so commonly associated with this type of copper deposit. Several

NE-trending trans-tensional structures have developed and may host copper deposits at the intersection with transverse structures or dikes within favorable stratigraphic units. Window Mineral's Rio 27 mine hosts a least two of these structural intersections accommodating at least two sub-vertical cylindrical 'chimney'-like bodies whose ultimate geometry and size have not been defined. The copper deposits are accessed via a series of levels and ramps providing ingress to LHD-based mining methodologies.

In general, the proposed exploration model is pegged to the widely accepted model for Chilean-type Cu-Ag manto-type deposits like the large El Soldado deposit. Another likely example of this deposit type is the Rio 27 mine which is centrally located within the Illapel project area. This small, active mine is following a robust mineral system along strike and to depth and will likely provide useful information for the exploration of suspected copper deposits within the Project area. Unfortunately, current development does not have access to drill holes, geologic maps or geochemical data, i.e. copper assays; it is done by visual grade estimates. These limitations are common to the many 'small miners' throughout the western cordillera of Chile. The absence of geologic data does not allow for projection and, consequently, the generation of a resource. Regardless, features easily observed in, above and adjacent to the mine can be observed within the Illapel project suggesting that these high-grade copper deposits could be widespread including extensions of the Rio 27 deposits into the Illapel project area.

The Illapel project area was visited by the Author between March 20 to 23, 2024 and has provided evidence for the possibility of additional 'manto-type' copper deposits; there is widespread surface copper manifestations throughout the property. Sampling (10 samples) conducted during the visit revealed copper-in-rock mineralization ranging from 0.40% to 6.54% Cu and up to 66ppm Ag from exposures known to host copper mineralization. All samples but two exceeded the 1.39% Cu reported for the Rio 27 mine's run-of-mine grade.

Considering that little or no technical data has been generated by the property vendor and mine's operator, exploration proposed to Vortex should develop geologic and geochemical models prior to drilling. Some surface exploration was conducted on the Illapel property by Santiago Metals (ca. 2015) and has provided Vortex with a glimpse of the property's potential.

Immediately west of the property is the Farellon Sanchez copper-gold vein district hosted mostly within the Illapel batholith. Some of these veins extend into the Illapel property and provide gold-copper targets of immediate interest.

A field program (Phase 1) is proposed to better characterize the mineralized areas identified in this report and refine existing targets for proposed drilling in a subsequent Phase 2. Considering the paucity of samples and absence of a geologic database or map, Phase 1 studies should focus on this critical void. The goals of Phase 1, considering the Exploration Model presented in Section 8.0, will be to define features considered important such as structures, volcanic stratigraphy, crosscutting intrusive rocks, distribution of copper mineralization and associated alteration. The proposed budget for Phase 1 is between US\$107,000 and US\$125,000.

The work described below will lead to a decision point on whether Phase 2 is warranted. This phase will focus on core drilling along the Rio 27 trend both NE and SW of the mine and in other prospects deemed sufficiently prospective. The Author recommends up to 2,000 metres of core drilling and a budget of approximately US\$1 million.

Section 2.0 Introduction and Terms of Reference

This report was prepared at the request of Mr. Vikas Ranjan, CEO and Director of Vortex Metals Inc. (Vortex), a Canadian-based, publicly held company trading on the TSX Venture Exchange under the symbol of VMS (TSX.V) with its corporate office at Suite 2500, 120 Adelaide Street West, Toronto, Ontario M5H 1T1 . This report is intended to be an independent technical report on the Illapel Copper Project located in Coquimbo, Chile (Project) per Policy requirements of the TSX Venture Exchange.

The Author has reviewed all relevant and material information from sources available to the Author, including the visit to the project on February 20 to 23, 2024 which supported the preparation of this Technical Report. This visit included the following activities:

1. Meeting with the Optionors and a detailed visit of the SLM Rio 27's mine (Rio 27 mine) including sampling of three working faces;
2. Tour of the metallurgical facilities including a sample of the final concentrate;
3. Inspection of the geology and mineralized exposures immediately adjacent to and outside of the Rio 27 concession and within the subject property; and
4. Detailed inspection of several mineralized exposures and the collection of samples at exploration sites throughout the property.

The Author has also reviewed all relevant and material information provided to the Author by Window/Ventana Minerals including internal summaries, 3rd party reports and historical data.

This Technical Report summarizes the Illapel Cu (Ag) Project including the history, geology, deposit model descriptions, current mining and the exploration potential. Very limited exploration has been conducted over the project area but a considerable amount of historical and artisanal mining activity has occurred although poorly documented.

Information presented in this report has been compiled from several sources (see References – Section 18.0). Most importantly, the Option Agreement has been reviewed and is summarized within. Because the recommendations and proposed work at the Illapel Copper project includes only mapping and sampling (Phase 1) and likely drilling (Phase 2), the scope of this report has been intentionally constrained.

This Technical Report uses the Metric Systems (System International or “SI”) as the system of measure and length. Metal and mineral acronyms in this Technical Report conform to mineral industry accepted usage. All currency is expressed in U.S. (\$) dollars.

Table 2.1 lists the common abbreviations that are used in this Technical Report. Unless otherwise mentioned, all coordinates in this Technical Report are provided as UTM datum NAD84, Zone 19S.

Table 2.1 Abbreviations.

Abbreviation	Unit or Term	Abbreviation	Unit or Term
Ag	Silver	km ²	Square kilometres
ASL	Above Sea Level	M	Metre
Au	Gold	mm	Millimetre
C	Celsius	Ma	Million years
Cm	Centimetre	NI 43-101	Canadian National Instrument 43-101
Cu	Copper	NSR	Net Smelter Return
°	degree (degrees)	%	Percent
Ddh/dh	Diamond drill hole/drill hole	ppm	Parts per million
G	Gram	QA/QC	Quality Assurance/Quality Control
GIS	Geographic Information System	T	Metric tonne (1,000 kg)
g/t	grams per tonne	SCM	Sociedad Contractual Minera
Ha	Hectare	SLM	Sociedad Legal Minera
Km	Kilometre	UTM	Unidad Tributaria Mensual

This report has been prepared to comply with the requirements of National Instrument 43-101 - Standards of Disclosure for Mineral Projects, the associated Companion Policy 43-101CP, Form 43-101F1 of the Canadian Securities Administrators and associated best practice guidelines and definitions from the Canadian Institute of Mining and Metallurgy.

Section 3.0 Reliance on Other Experts

In addition to the writer's own observations, data collection and literature review, information provided by the client has been relied upon. The main sources of literature used in the compilation of this report are presented below; additional sources of information are referenced in the text where applicable and all sources are listed in Section 18.0 (References).

The Author has relied on a report provided by Maximiliano Urrutia of Carey, a Chilean attorney and law firm, whereby the ownership of the exploitation and exploration concessions held by Window Minerals SCM (Chilean company) and SLM Rio 27 de Farellon Sanchez has been confirmed and qualified. The legal status of the holding company, SCM Ventana Minerals has also been confirmed (Section 4.2).

- Urrutia, Maximiliano (Attorney at Law; Carey), Date: April 2, 2024, Legal Opinion on Windows Minerals SCM's Mining Concessions requested by Vortex Metals, Inc.; 22 p.

Section 4.0 Property Description and Location

4.1 Property Location, Description and Ownership

The Illapel Copper-Silver Project is located in the community of Illapel, Province of Choapa, Fourth Region of Coquimbo, Chile and is located 25 km northeast of the town of Illapel and 223 km north of the capitol city of Santiago (Figure 4.1). Road access to the mine is good and can be reached from the SLM Rio 27's mill, located about 3km east of Illapel, in about 45 minutes. The project's geographic center is located at about 6,515,000N and 315,000E UTM WGS 1984 Zone 19S (Figure 4.1). The project lies immediately east of the Farellon Sanchez gold-copper (epithermal, intermediate sulphidation veins) district which has been extensively developed but under a somewhat artisanal regimen.

The Project is composed of 33 'Exploitation' concessions for a total of 5,970 Hectares (Figure 4.1). Windows Minerals is the current owner of all exploitation mining concessions and SLM Rio de Farellon Sanchez is the current owner of one exploitation mining concession (Rio 27 1/30). which are collectively referred to as the "Exploitation Concessions" (Figure 4.1). Windows Minerals acquired the Exploitation Concessions and Exploration Concessions by purchase agreements entered into with the former owners Mr. Alfredo Brahm Moura, Scaner Inversiones y Asesorías SpA, Mr. Paul Fürst Gwinner, Mr. José Manuel Méndez Rioseco and SCM Ventana Minerals, all of which were duly registered with the Custodian of Mines of Illapel in October and November 2023 (R. Vergara & M. Urrutia, Carey Legal, April 2, 2024).

Windows Minerals SCM is a contractual mining company (Sociedad Contractual Minera) incorporated by public deed dated September 1st, 2014, granted before Santiago's Notary Public Mr. Armando Ulloa Contreras. An abstract of said deed was registered on page 385, number 86 of the Property Registry, and on page 452, number 379 of the Shareholders Registry, both kept by the Custodian of Mines of Santiago for year 2014. As of November 17th, 2023 there were 7 shareholders and 10,000 shares (R. Vergara & M. Urrutia, Carey Legal, April 2, 2024).



Figure 4.1. Location map of the Illapel copper-(silver) project, Coquimbo, Chile.

SLM Rio de Farellon Sanchez is a legal mining company (Sociedad Legal Minera) duly incorporated upon the sale by Mr. Alfredo Brahm Moura to Messrs. Paul Fürst Gwinner and Jose Manuel Méndez Rioseco of the mining concession “Rio 27 1/30”, by means of public deed dated October 27th, 2014, granted before Santiago’s Notary Public Mr. Armando Ulloa Contreras. The incorporation of SLM Rio was recorded on page 1,150, number 248 of the Property Registry, and on page 125, number 121 of the Shareholders Registry, both kept by the Custodian of Mines of Illapel of year 2014. As of November 17th, 2023 there were two (2) shareholders and 100 shares (R. Vergara & M. Urrutia, Carey Legal, April 2, 2024).

Table 4.1. List of Exploitation Concessions (Manifestaciones) subject to the ‘Agreement’.

#	Exploitation Concessions	Property Registry Mines Custodian of Illapel						Area (Ha)
		Final Judicial Award Registration and Measurement			Current Ownership Registration			
		Page	Number	Year	Page	Number	Year	
1	Ventana 1, 1/10	134	34	2014	118	51	2023	88
2	Ventana 2, 1/10 (1/9)	142	25	2014	119	52	2023	79
3	Ventana 3, 1/14	150	26	2014	120	53	2023	108
4	Ventana 4, 1/10	166	28	2014	121	54	2023	100
5	Ventana 5, 1/10	158	27	2014	122	55	2023	100
6	Ventana 6, 1/30	1096	189	2013	123	56	2023	300
7	Ventana 7, 1/20	1102	190	2013	124	57	2023	200
8	Ventana 8, 1/9	1108	191	2013	138	71	2023	82
9	Ventana 10, 1/30	1115	192	2013	125	58	2023	300
10	Tata 1, 1/6	37	8	2012	130	63	2023	36
11	Rio 7, 1/20	817	148	2012	128	61	2023	200
12	Rio 8, 1/30	823	149	2012	129	62	2023	300
13	Lola 1, 1/30	1122	193	2013	126	59	2023	300
14	Lola 3, 1/30	1128	194	2013	127	60	2023	300
15	Calabazo 1, 1/15	627	125	2014	131	64	2023	145
16	Calabazo 2, 1/15	633	126	2014	132	65	2023	110
17	Calabazo 3, 1/15	639	127	2014	133	66	2023	122
18	Calabazo 4, 1/10	645	128	2014	134	67	2023	94
19	Calabazo 5, 1/15	651	129	2014	135	68	2023	150
20	Illapelina 20, 1/20	320	91	2016	136	69	2023	182
21	Illapelina 21, 1/20	67	13	2017	137	70	2023	161
22	Rio 27, 1/30	45	12	2011	1150	248	2014	300
23	Illapelina 1, 1/30	278	69	2019	3	2	2024	270
24	Illapelina 4, 1/10	283	70	2019	4	3	2024	100
25	Illapelina 5, 1/20	288	71	2019	5	4	2024	180
26	Illapelina 8, 1/30	293	72	2019	6	5	2024	300
27	Illapelina 9, 1/10	298	73	2019	7	6	2024	100
28	Illapelina 22, 1/20	326	92	2016	8	7	2024	197
29	Illapelina 23, 1/20	333	93	2016	9	8	2024	166
30	Illapelina 24, 1/20	341	94	2016	10	9	2024	200
31	Illapelina 25, 1/20	347	95	2016	11	10	2024	200
32	Illapelina 28, 1/20	353	96	2016	12	11	2024	200
33	Illapelina 29, 1/30	359	97	2016	10	9	2024	300

Based on the copies of registrations issued by the Custodian of Mines of Illapel on August, October, and November 2023, and in March, 2024, all the Exploitation Mining Concessions are in good standing and registered under the name of Windows Minerals SCM and, SLM Rio 27 de Farellon Sanchez whereas the Exploration Mining Concessions held by Mr. Jose Manuel Mendez are terminated, and there are no royalties or liens in favor of third parties other than two mortgages and prohibitions in favor of the National Mining Company (ENAMI; see Section 4.6). Most of the mining licenses have been duly paid thru February 28, 2024. However, there are ongoing judicial proceedings to collect payment of some licenses as described below.

Article 146 of the Mining Code provides that if mining licenses are not paid within the legal term (during March of each year), the General Treasury of the Republic (“Treasury”) will be entitled to initiate a judicial procedure to collect payment of the outstanding license by selling the mining concessions in public auction. The holder of the relevant concession can exclude it from the auction by paying an amount equivalent to twice the unpaid mining license. Otherwise, the mining concession will be auctioned and, in the absence of bidders, the Court can declare the concession as “terreno franco” (free space or terminated). According to the information provided in the Legal Opinion, the Mining Concessions listed in Table 4.2 are currently under judicial proceedings to collect payment of outstanding licenses.

Regarding the judicial proceedings for years 2013 and 2016, Uruttia (2024) was not able to confirm whether the auctions took place or not, as the information available in public sources is incomplete. Additionally, the public auctions of the judicial proceedings for years 2016, 2019, 2020, 2022 and 2023 were suspended and have not been rescheduled. Also, Uruttia (2024) was not provided with all the payment receipts for the mining licenses and was unable to confirm whether the mining licenses for the aforementioned periods were duly paid. However, if those mining licenses are indeed unpaid, the statute of limitations of the collection action, which is three years as of April 1st of the year in which the mining license was due, has already elapsed for periods 2013, 2015, 2016, 2019, 2020, and 2021.

Table 4.2 Exploitation Concessions subject to Judicial Proceedings (X).

#	Mining Concessions	Period of outstanding licenses.							
		2013	2015	2016	2019	2020	2021	2022	2023
1	Ventana 1, 1/10	X	✓	X	X	✓	✓	✓	✓
2	Ventana 2, 1/10 (1/9)	✓	✓	X	X	✓	✓	✓	✓
3	Ventana 3, 1/14	✓	✓	X	X	✓	✓	✓	✓
4	Ventana 4, 1/10	✓	✓	X	X	✓	✓	✓	✓
5	Ventana 5, 1/10	X	✓	X	X	✓	✓	✓	✓
6	Ventana 6, 1/30	X	X	X	X	✓	✓	X	✓
7	Ventana 7, 1/20	X	X	X	X	✓	✓	✓	✓
8	Ventana 8, 1/9	✓	✓	X	X	✓	✓	✓	✓
9	Ventana 10, 1/30	X	X	X	X	✓	✓	✓	✓
10	Tata 1, 1/6	✓	✓	X	X	✓	✓	✓	✓
11	Rio 7, 1/20	✓	X	X	X	✓	✓	✓	✓
12	Rio 8, 1/30	X	X	X	X	✓	✓	✓	✓
13	Lola 1, 1/30	✓	✓	X	X	✓	✓	✓	✓
14	Lola 3, 1/30	✓	✓	X	X	✓	✓	✓	✓
15	Calabazo 1, 1/15	✓	✓	X	X	X	✓	X	✓
16	Calabazo 2, 1/15	✓	✓	X	X	X	✓	X	✓
17	Calabazo 3, 1/15	✓	✓	X	X	X	✓	X	✓
18	Calabazo 4, 1/10	✓	✓	X	X	X	✓	X	✓
19	Calabazo 5, 1/15	✓	✓	X	X	X	✓	X	✓
20	Illapelina 20, 1/20	✓	✓	X	X	X	✓	✓	✓
21	Illapelina 21, 1/20	✓	✓	X	X	X	✓	X	✓
22	Rio 27, 1/30	✓	✓		✓	✓	✓	✓	✓
23	Illapelina 1, 1/30	N/A	N/A	N/A	X	X	X	X	X
24	Illapelina 4, 1/10	N/A	N/A	N/A	X	X	X	X	X
25	Illapelina 5, 1/20	N/A	N/A	N/A	X	X	X	X	X
26	Illapelina 8, 1/30	N/A	N/A	N/A	X	X	X	X	X
27	Illapelina 9, 1/10	N/A	N/A	N/A	X	X	X	X	X
28	Illapelina 22, 1/20	N/A	✓	X	X	X	X	X	X
29	Illapelina 23, 1/20	N/A	✓	X	X	X	X	X	X
30	Illapelina 24, 1/20	N/A	✓	X	X	X	X	X	X
31	Illapelina 25, 1/20	N/A	✓	X	X	X	X	X	X
32	Illapelina 28, 1/20	N/A	✓	X	X	X	X	X	X
33	Illapelina 29, 1/30	N/A	✓	X	X	X	X	X	✓

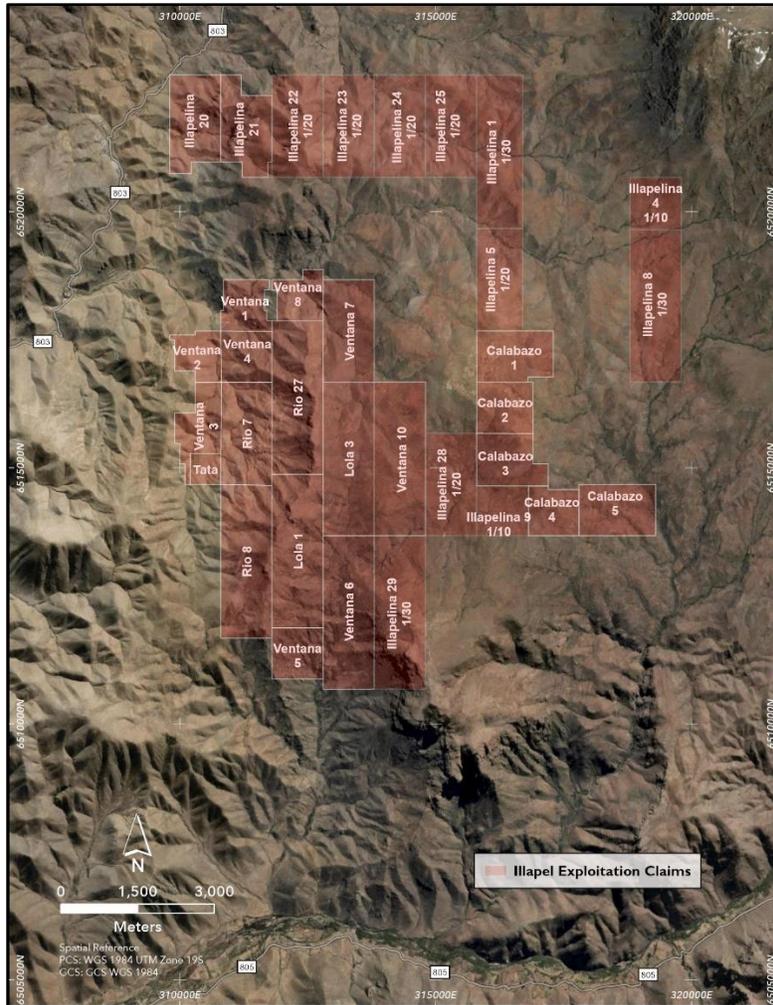


Figure 4.2 Layout of the exploitation concessions subject to the Agreement.

4.2 Mineral Tenure

Chile’s mining policy is based on legal provisions that were enacted as part of the 1980 constitution. These were established to stimulate the development of mining and to guarantee the property rights of both local and foreign investors. According to the law, the State owns all mineral resources, but the exploration and exploitation of these resources by private parties is permitted through mining concessions (AX Legal, 2021, Chilean Mining Law Basics: <https://ax.legal/contact-us/>).

Mining concessions have both rights and obligations as defined by a Constitutional Organic Law (enacted in 1982). Concessions can be mortgaged or transferred, and the holder has full ownership rights and is entitled to obtain the rights of way (servidumbres) for exploration (pedimentos) and exploitation (mensuras).

In addition, the concession holder has the right to defend ownership of the concession against State and Third Parties. A concession is obtained by a claim filing and includes all minerals that may exist within its area.

Exploration Concession (Pedimento): A pedimento is an initial exploration claim whose position is well defined by Universal Transverse Mercator (UTM) coordinates which define north-south and east-west boundaries. The minimum size of a pedimento is 100 ha and the maximum is 5,000 ha with a maximum length-to-width ratio of 5:1.

The legal duration is for a maximum period of two years; however, at the end of this period, and provided that no overlying claims have been staked, the claim must be reduced in size by at least 50% and renewed for an additional two years. If the yearly claim taxes are not paid on a pedimento, the claim can be restored to good standing by paying double the annual claim tax the following year.

New pedimentos are allowed to overlap with pre-existing ones; however, the underlying (previously staked) claim always takes precedent, providing the original claim holder does not allow the claim to lapse due to a lack of required tax payments, corrects any minor filing errors, and converts the pedimento to a manifestación within the initial two-year period.

Exploitation Concession (Manifestación):

Before a ‘pedimento’ expires, or at any stage during its two-year life, it may be converted to a ‘manifestación’ or exploitation concession.

Within 220 days of filing a ‘manifestación’, the applicant must file a “Request for Survey” (Solicitud de Mensura) with the court of jurisdiction, including official publication that advises the surrounding claim holders, who may raise objections if they believe their pre-established rights are being encroached upon.

A manifestation may also be filed on any open ground without going through the ‘pedimento’ filing process. The owner is entitled to explore and to remove materials for study only (i.e. sale of the extracted material is forbidden). If an owner sells material from a manifestation or exploration concession, the concession will be terminated.

Survey (Mensura): Within nine months of the approval of the “Request for Survey” by the court, the claim must be surveyed by a government licensed surveyor. Surrounding claim owners may be present during the survey. Once surveyed, presented to the court, and reviewed by the National Mining Service (SNGM), the application is adjudicated by the court as a permanent property right (a mensura), which is equivalent to a “patented claim” or exploitation right.

Exploitation concessions are valid indefinitely and are subject to the payment of annual fees. Once an exploitation concession has been granted, the owner can remove materials for sale.

There is a mining tax that provides protection of rights; it is calculated as a percentage of the Unidad Tributaria Mensual (UTM or monthly tax unit) and applies to each hectare of land included in the mining exploration and/or mining exploitation concessions. This tax is paid annually in a single payment before 31 March of each year. The current UTM is CLP\$64,793 or US\$67.00.

For mining exploitation concessions, the tax rate is currently 10% of a UTM per hectare; for mining exploration concessions the tax rate is currently 2% of a UTM per hectare. The value of the UTM is adjusted monthly according to the consumer price index (IPC) in Chile.

At each of the stages of the claim acquisition process, several steps are required (application, publication, inscription payments, notarization, tax payments, patent payment, lawyers' fees, publication of the extract, etc.) before the application is finally converted to a declaratory sentence by the court constituting the new mineral property. New claims are published in Chile's official mining bulletin for the appropriate region (published weekly). At the manifestación and mensura stages, a process for resolution of conflicting claims is allowed. Most companies in Chile retain a mining claim specialist (landman) to review the weekly mining bulletins and ensure that their land position is kept secure.

In summary, the Illapel project is composed of both Exploration and Exploitation concessions which are immovable property but independent from surface rights. Concession holders can occupy as much of the surface land as is necessary for exploration, exploitation and/or mineral processing works with mining easements provided the proper compensation for all damages caused to the owner of the land and any other third party. Mining easements can be obtained by direct negotiation and agreement with the owner of the surface land or by means of a judicial award issued in a simple and summary proceeding before the relevant Civil Court, in which the holder of the mining concession files a claim for mining easements (occupation and/or transit) against the owner of the land. The mining legislation generally favors holders of mining concessions over the owners of surface lands, as it prioritizes the development and exploitation of mining resources.

Owners of mining concessions must pay an annual license (patente) equivalent to approximately US\$4.17 per hectare (3/50 of UTM in Feb., 2024) in the case of exploration mining concessions, and an amount that ranges between approximately US\$28 and approximately US\$829 per hectare in the case of exploitation mining concessions (1/10X UTM in 2024; increases to 4/10X to 12X UTM in 2025); depending on the years in which the concession has been in good standing. Notwithstanding, owners of exploitation mining

concessions can apply for a reduced mining license of approximately US\$7 per hectare (1/10 x UTM), provided that each year they evidence to SNGM (National Geology & Mining Service) the undertaking of works that on a permanent and continuous basis enable the development of “mining operations”. Payment must be made during the month of March of each year. Other than the annual licenses there are no investment commitments or obligations upon the owner of the mining concession to hold its tenure and property.

Owners of mining concessions shall submit to SNGM a geologic report summarizing all information obtained from exploration works, either within 30 days expiration of the exploration mining concession’s expiration (or before the termination to apply for an extension), every two years in the case of exploitation mining concessions.

4.3 Terms and Conditions – First Option

Vortex signed a Letter of Intent (LOI) on June 27, 2023, with SCM Windows Minerals Group, a Santiago, Chile based mining Company (see VMS PR June 27, 2023). On November 20, 2023, the Definitive Agreement was signed with SCM Windows Minerals Group and SLM Rio 27 De Farellon Sánchez (jointly the Optionors) for an option to acquire up to an 80% Interest in the Illapel Copper Project.

Vortex will have the right to earn a 60% interest in the Illapel Project (“1st Option”) by making cash payments, issuing Vortex Shares, and incurring exploration expenditures in accordance with the following schedule presented in Table 4.3.

Table 4.3. Summary of Cash Payments, Number of Vortex Shares and Exploration Expenditures for the First Option Period; in US\$.

Date	Cash Payments (US\$)	Number of Shares	Exploration Expenditures (US\$)
Signing (Nov. 20, 2023)	\$200,000	NA	NA
1st Anniversary	\$150,000	NA	NA
2nd Anniversary	\$200,000	3,000,000	\$2,000,000
3rd Anniversary	\$275,000		\$1,000,000
4th Anniversary	\$275,000		\$2,000,000
5th Anniversary	NA	5,000,000	\$5,000,000
6th Anniversary	NA	15,000,000	NA

In addition to the above, the Pre-Feasibility Study must be completed no later than seventy-two (72) months after the Effective Date (6th Anniversary). This deadline may be extended by a further 12 months by increasing the cash portion of the First Option obligation by \$200,000.

In summary, the First Option through the 6th Anniversary will require cash payments of \$1.1 million, 23,000,000 VMS shares (subject to a 19.9% cap calculated on the issued and

outstanding common shares of Vortex (the “Cap”)) and \$10,000,000 in exploration expenditures. Additionally, if completion of the Pre-Feasibility Study requires an additional year (7th Anniversary), the total cash payments will increase to \$1.3 Million. Cash payments to SLM Rio, in monthly installments of \$4,500, starting six (6) months from the Closing Date, will be made and capped at \$226,000, corresponding to Vortex’s contribution to settle the ENAMI Debt (see Section 4.6).

If Vortex spends USD\$10,000,000 in exploration expenditure but decides not to exercise the stage one option, then the Definitive Agreement will terminate, additional 5,000,000 Vortex shares will be issued, and the ownership of the Project will remain with Ventana. Vortex will then be granted a Net Smelter Royalty (NSR) of 1.5% on the entire project, encompassing all mining claims subject to this agreement with maximum amount recoverable through the NSR being capped at USD \$10,000,000.

4.4 Terms and Conditions – Second Option

Following the exercise of the First Option, Windows will grant Vortex an option to earn an additional 20% interest in the Project (the “Second Option”) by completing a feasibility study on the Project. The Second Option will be deemed to be validly exercised upon the completion of the feasibility study on the Project as described above.

Once Vortex exercises the Second Option, it will arrange project financing for 100% of the project, including Ventana’s share of 20% which will be recovered from commercial production.

Ventana will also be granted a Net Smelter Royalty (NSR) of 2.5% on the entire project, encompassing all mining claims subject to this agreement from the effective date of this agreement. Vortex will have a right to buy 0.5% of the NSR by paying USD\$1.75M at any time from the effective date of this agreement.

All Vortex Shares issuable pursuant to the Definitive Agreement will be subject to a 24-month contractual escrow from the date of issuance. Twenty-five percent of the Vortex Shares will become free trading every 6 months following the date of issue. It is expected that Ventana will nominate one person to the board of Vortex following the definitive agreement becoming effective.

4.5 Joint Venture

Following the exercise of the First Option and upon the formation of JVCo, the Parties will enter into a shareholder’s agreement (the “Shareholders Agreement”) containing terms customary for a transaction of this nature and acceptable to each of Vortex and the Optionor, acting reasonably, which shall include the following terms:

- (a) Vortex shall be the operator of the Project (the “Operator”) for so long as it holds and continues to hold a majority participating interest in JVCo;

- (b) Vortex may resign as the Operator with no less than sixty (60) days' prior written notice to the Optionor;
- (c) Vortex and the Optionor shall fund all JVCo's costs and expenditures in proportion to their respective participating interest, except for the costs and expenditures required for completing a Feasibility Study which shall be borne by Vortex;
- (d) the participating interests of the Parties will be subject to straight-line and accelerated dilution on customary terms, as shall be agreed upon in the Shareholders Agreement;
- (e) Either party's participating interest will be subject to a right of first refusal for the benefit of the other party;
- (f) a management committee (the "Management Committee") shall be formed, consisting of two (2) representatives from each of Vortex and the Optionor, and Vortex, as long as it is the largest holder of JVCo, shall have the right to appoint its representative as the president who shall be a fifth member of the Management Committee. The Operator and members of the Management Committee shall present work programs and budgets to the Management Committee for approval by the majority of the members of the Management Committee; provided, however, an approval by the Management Committee of an increase of management fee for the Operator shall include the approval of at least one member appointed by the Optionor. The Management Committee shall review the programs and budgets submitted and, if it deems fit, approve the programs and budgets with such modifications, if any, as the Management Committee deems desirable;
- (g) Vortex will arrange 100% of debt project financing to develop the Property, if approved by the Management Committee. Windows will then receive payment from future production that will be first adjusted/reduced by the amount of project financing cost for its 20% shares, as agreed thereof in the JVCo Shareholders Agreement.
- (h) The Operator will receive a fee equivalent to 10% of all expenditures of JVCo for each fiscal quarter up until the commencement of commercial production, as shall be defined in the Shareholders Agreement.
- (i) All other usual terms and provisions applicable to mining joint ventures under Chilean law.

The Parties (will) endeavor to draft and negotiate in good faith the Shareholders Agreement during the 180 days following Exchange Acceptance.

4.6 Brownfield Project

If SLM Rio 27 de Farellon Sanchez, owner of the Rio 27 concession 'Brownfield Project', Rio 27 mine and processing plant in Illapel, receives a bona fide offer from an arm's length

third party and determines to sell all or any portion of the Brownfield Project (Figure 4.2), it shall deliver a written notice to Vortex specifying the detailed terms of the third-party offer. Vortex shall have the right to purchase the Brownfield Project interest at the purchase price and on the terms set forth in such notice by delivery to SLM Rio 27 de FS of a notice of exercise (the “**Notice of Exercise**”) of the right of first refusal within one hundred and twenty (120) days after the date the notice is delivered to Vortex (the “**Evaluation Period**”). If Vortex exercises the right of first refusal, Vortex and SLM Rio shall thereupon consummate the sale of the Brownfield Project to Vortex on the terms set forth in the Notice of Exercise within one hundred and twenty (120) days after the date such notice is delivered to Vortex; provided, however, that in the event the Notice of Exercise provides for the payment for the Brownfield Project other than in cash, Vortex shall have the option of paying for the Brownfield Project by the present value cash equivalent of the consideration described in the Notice of Exercise as reasonably determined by Vortex. If Vortex does not exercise its rights pursuant to this sub-agreement, SLM Rio 27 de FS will have the right to consummate the sale which gave rise to the right of first refusal within 60 days of the end of the Evaluation Period if Vortex has failed to provide Notice of Exercise, following which time, the rights defined here will once again apply.

If SLM Rio 27 de FS ultimately sells the Brownfield Project to a third party other than Vortex, in accordance with the above, it will be subject to any rights of access as reasonably required by Vortex or the JVCo, to the extent applicable, to continue to access the Property.

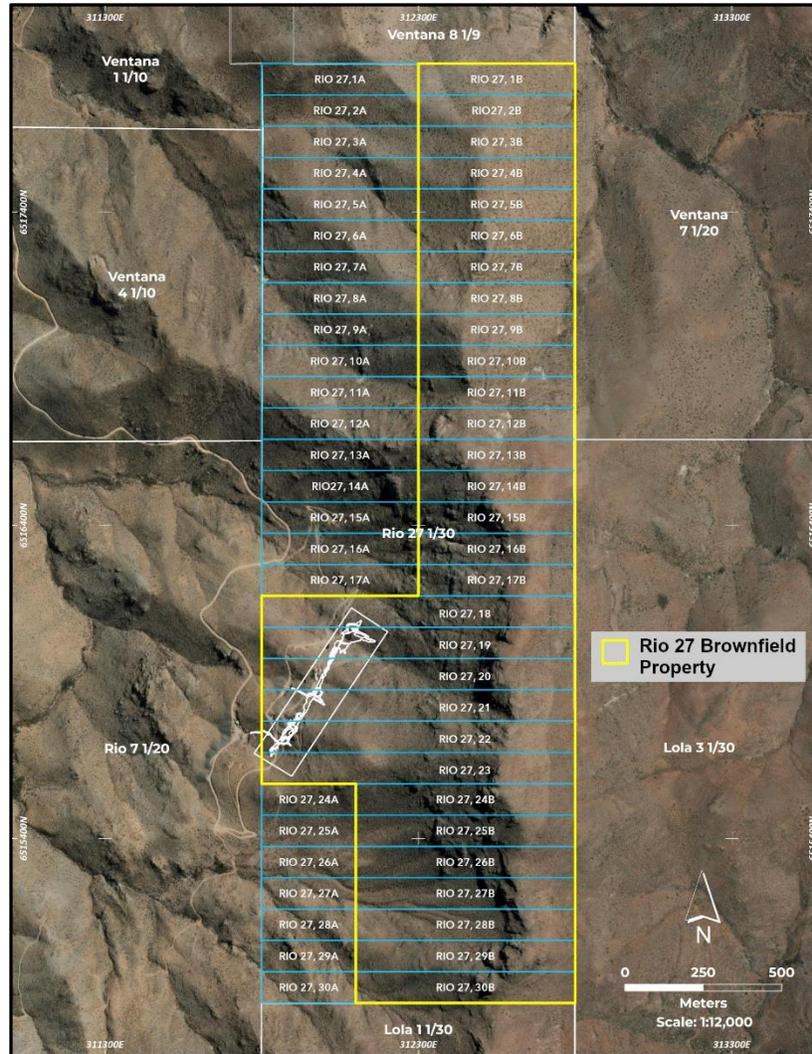


Figure 4.3 Detailed view of the Rio 27 Brownfield Project relative to the Rio 27 mine area (white rectangle) and mine workings.

4.7 Encumbrances

According to the documents provided and the on-site review of the relevant registrations, Uruttia (2024) concluded that there are no mortgages, encumbrances, prohibitions and/or interdictions affecting the Mining Concessions except for the following:

- (i) First degree mortgage over the mining concessions “Rio 27, 1/30” in favor of the National Mining Company (Empresa Nacional de Minería /“ENAMI”), registered on page 4, number 2, of the Registry of Mortgages and Encumbrances of the Custodian of Mines of Illapel of year 2011.
- (ii) Prohibition to transfer and encumber the mining concessions “Rio 27, 1/30” without prior consent from ENAMI, registered on page 3, number 2, of the Registry of Prohibitions and Interdictions of the Custodian of Mines of Illapel of year 2011.

- (iii) Second degree mortgage over the mining concessions “Rio 27, 1/30” in favor of ENAMI, registered on page 38, number 7, of the Registry of Mortgages and Encumbrances of the Custodian of Mines of Illapel of year 2019.
- (iv) Prohibition to transfer and encumber the mining concessions “Rio 27, 1/30” without prior consent from ENAMI, registered on page 9, number 6, of the Registry of Prohibitions and Interdictions of the Custodian of Mines of Illapel of year 2019.

The above-mentioned liens secure payment of loans granted by ENAMI for an aggregate amount of USD\$452,326.23.

4.8 Environmental Liabilities

The Author has visited all of the prospects within the project area that can be accessed in vehicle and did not observe any impact that would create a potential environmental liability.

4.9 Permits Required to Conduct Proposed Activities

The activities proposed in Section 17.0 include 2 phases: Phase 1- Mapping and Sampling and Phase 2 – Drilling; permits are not required to conduct Phase 1. However, Phase 2 will require informing a government agency that oversees said activities, of the number and location of the proposed drill sites. The access roads and drill pads for targets immediately north and south of the Rio 27 mine are constructed.

The SEIA (Environmental Impact Evaluation System) Regulations (Decree N° 40/2012 of the Ministry of the Environment), define “mining development projects” as any action or work related to the extraction or processing of one or more mining deposits and whose mineral extraction capacity exceeds 5,000 tonnes/month. In addition, “prospections” refer to the set of works and actions to be developed after mining explorations, leading to geologic certainty in the identification of an economic mineral deposit necessary for its required characterization. For purposes of mine planning upon which deposit exploitation is based, permitting is required when forty (40) or more drill pads, including the drilling, are considered. Therefore, any activity that may qualify as “mining development projects” or “prospections” under the law is, in principle, obliged to obtain prior environmental approval through the SEIA.

A mining project developer that requires undergoing environmental impact assessment must submit an Environmental Impact Study or an Environmental Impact Declaration, depending on the magnitude of the environmental impacts the project may generate. After a preliminary review performed by the environmental authority, the Environmental Impact Study or Declaration is delivered to the relevant public agencies with regulatory faculties over one or more components of the projects) for their observations and comments.

Section 5.0 Accessibility, Climate, Local Resources, Physiography, and Infrastructure

5.1 Access

The Illapel Project, along with the internal Rio 27 mine, is located in the ‘commune’ of Illapel, Choapa Province, IV Region of Coquimbo, Chile. The project is about 25 km northeast of the city of Illapel and 223 km north of the capital city of Santiago de Chile (Figure 2.1). From the SLM Rio 27 de Farellon Sanchez plant on the outskirts of Illapel, vehicular access to the project area is about 11km of asphalt and, eventually, gravel roads accessible to all vehicles. The roads are maintained by the Ministry of Public Works. The surrounding concessions, the subject of this report, are accessible via a network of improved gravel roads constructed by the small miners (pirquineros) over the past several decades and provide access to the numerous small mines and prospects. Within the project area, the Optionor has constructed a network of roads providing two access routes to the Rio 27 mine and other small mines and prospects. Several of the concessions in the eastern part of the project area (Figure 5.1), and peripheral to the primary areas of interest, are only accessible ‘on foot’ or horseback.

The project area is mountainous with elevations ranging between 750 and 1,500 meters. Slopes are moderately steep and rocky with little vegetation aside from low lying shrubs and cacti.

5.2 Climate

The Coquimbo region is contained in the Norte Chico ecological zone which is one of six natural zones in Chile divided on the basis of latitude and are, essentially, ecological boundaries; these divisions were defined by the government agency CORFO in 1950 (Figure 5.2). Its northern border is formed by the limit with the Far North (Zone 1), to the west lies the Pacific Ocean, to the east the Andes mountains and Argentina, and to the south the Zona Central natural region (Zone 3). From a strictly geographic perspective, this natural region corresponds to the Chilean territory between the Copiapó River on the north and Aconcagua River to the south. Traditionally, the Norte Chico refers to the zone comprising the regions of Atacama and Coquimbo (Wikipedia, 2023).

The Norte Chico zone extends from the southern border of the [Atacama Desert](#) to about 32° south latitude, or just north of [Santiago](#). It is a semiarid region whose central area receives an average of about 25 mm of rain during each of the four winter months, with trace amounts the rest of the year (Figure 5.3). The Norte Chico is also subject to droughts. The temperatures are moderate, with an average of 18.5 °C during the summer and about 12 °C during the winter at sea level (Figure 5.4). The winter rains and snowmelt from the Andes Mountains provide water to rivers in the region, even though the river flow varies with the seasons.

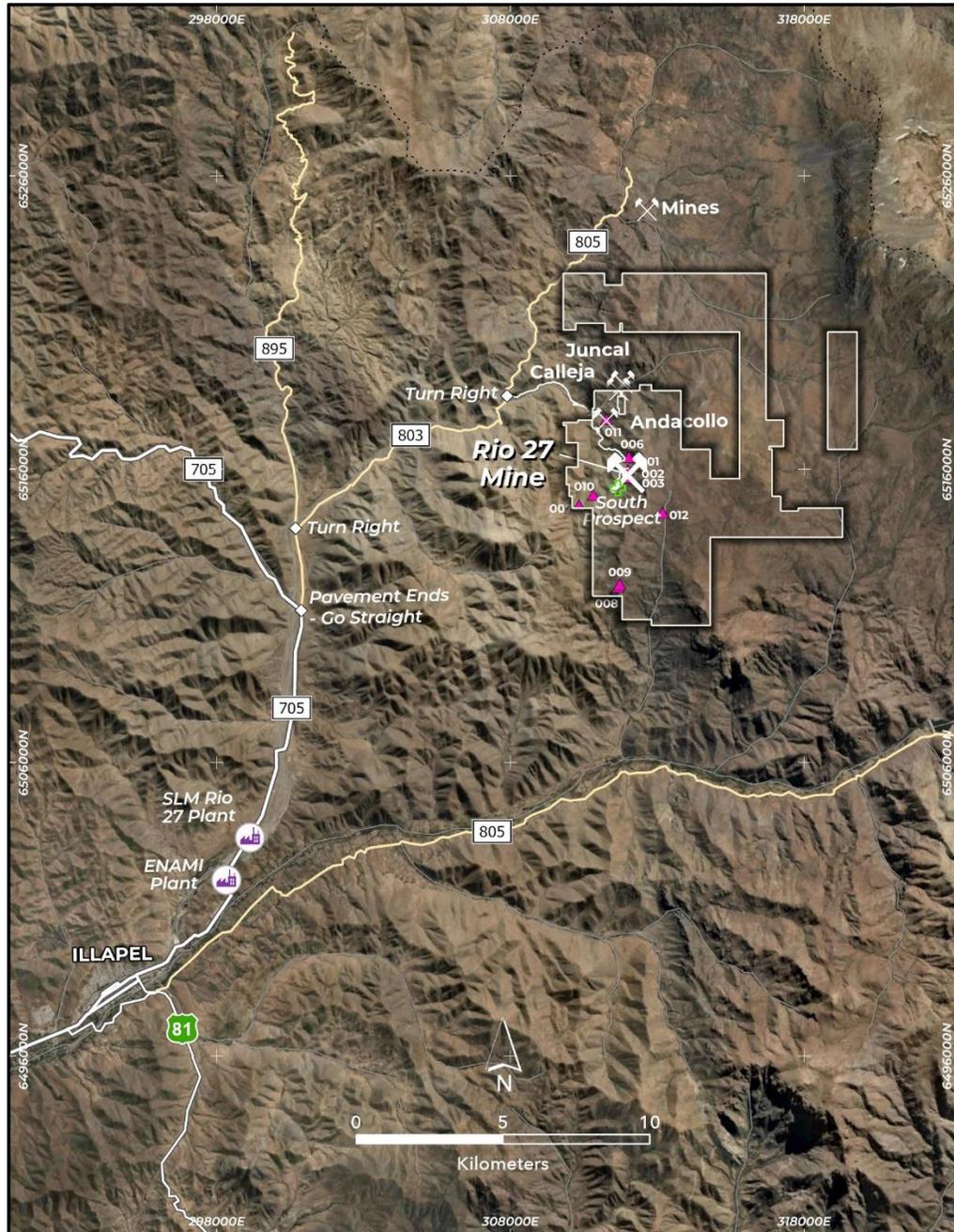


Figure 5.1. Location map of the Illapel project showing access roads and important infrastructure and physiographic features.

The coastal areas of the Norte Chico region have a distinct microclimate. Airborne moisture of the sea is trapped by high bluffs flanking the coast serve to form the Valdivian temperate rainforest due to the heavy fog and light rains. The river valleys carrying water from the Andes allow for maritime moisture to migrate inland as fog and create conditions more favorable for agriculture. The higher elevations in the interior sections are covered with shrubs and cacti of various kinds.

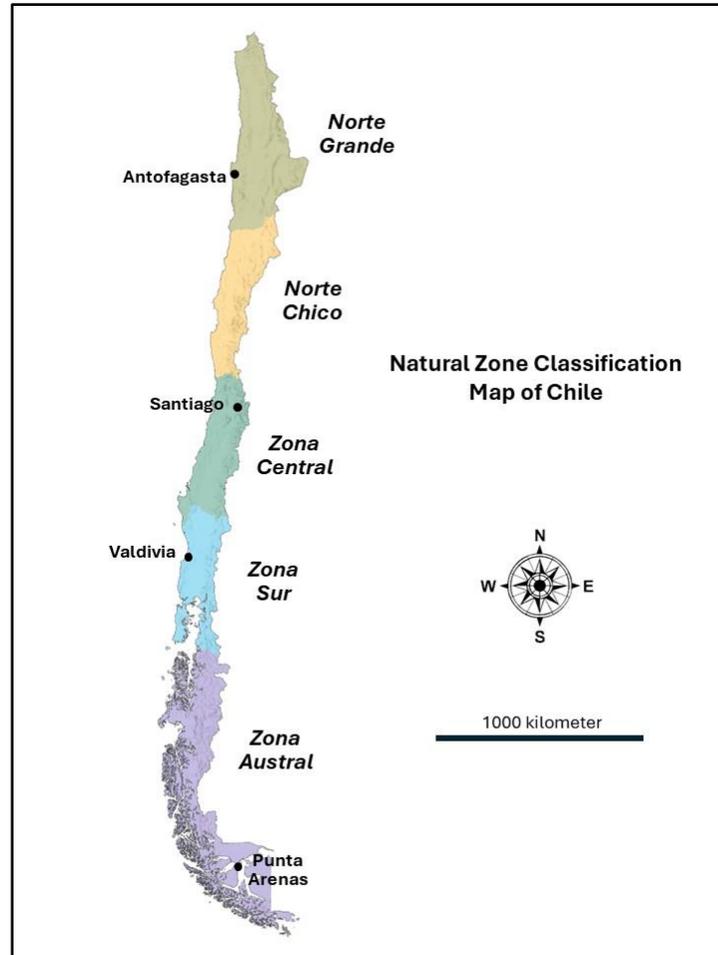


Figure 5.2. Map showing the Natural Regions of Chile. Zone 2 is Zona Norte Chico which hosts the Illapel Project in the Coquimbo region. REPLACE

Norte Chico is a highly mountainous district where distinct ranges or elongated spurs cross the country from the Andes to the coast, forming scenic and fertile transverse valleys. The most famous of these is the [Elqui Valley](#). The deep transverse valleys provide broad areas for cattle raising and, most important, fruit growing, an activity that has developed greatly since the mid-1970s. Nearly all Chilean [pisco](#) is produced in the near north (Chilean laws defines the pisco as a drink produced in the Near North).

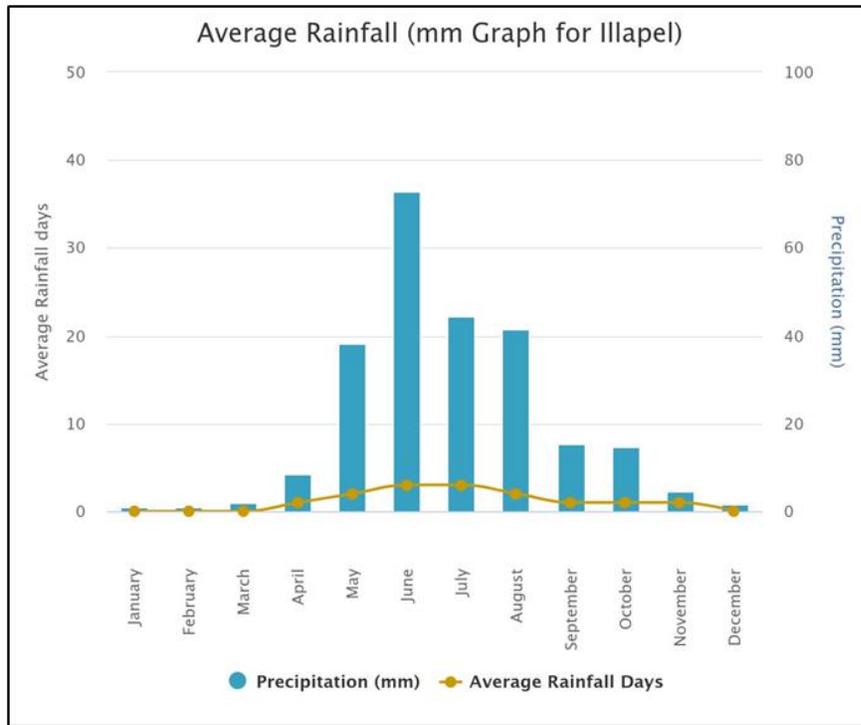


Figure 5.3. Average rainfall by month for Illapel and surrounding region (Wikipedia, 2023).

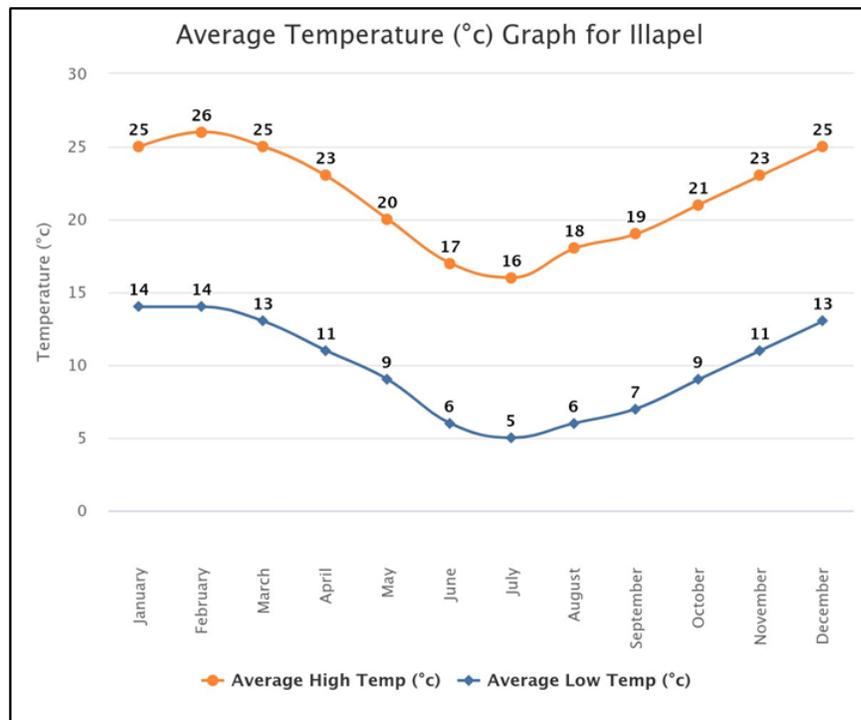


Figure 5.4. Average temperature (°C) by month for Illapel and surrounding region (Wikipedia, 2023).

More specifically, the climate of Illapel, Coquimbo, is temperate and dry as defined in Figure 5.5. The Koppen climate classification for the region ranges from temperate and dry with hot (Csa) to warm (Csb) summers. Average monthly maximum/minimum temperatures are shown in Figure 5.4. Average annual rainfall is less than 75mm which falls during the winter months (May through August) as shown in Figure 5.3. It is noteworthy that on Feb. 22, 2024, it rained during the Author’s visit.

5.3 Physiography

The Coquimbo Region is one of Chile's 16 administrative regions and is bordered by Atacama to the north, Valparaíso to the south, Argentina to the east, and the Pacific Ocean to the west. It is approximately 400 kilometres (250 mi) north of the national capital, Santiago (Figure 2.1). The capital and largest city is La Serena. Other important cities include the seaport Coquimbo and the agricultural center Ovalle.

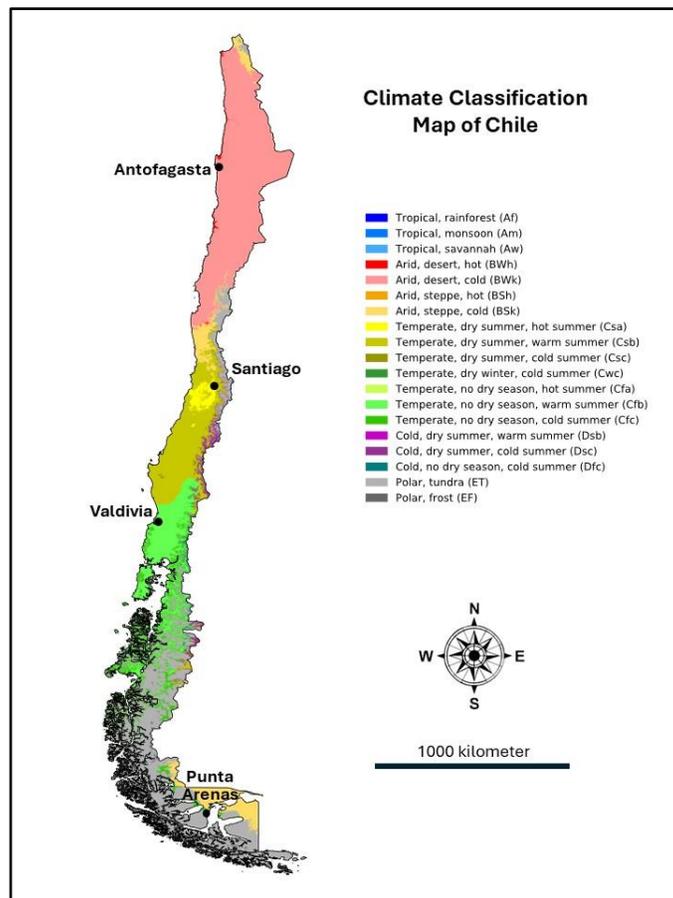


Figure 5.5. Koppen climate classification for Chile (from Wikipedia, 2023).

The Coquimbo Region forms the narrowest part, or 'waist', of Chile and is one of the country's more mountainous regions as the Andes runs closer to the sea than elsewhere. Mining and agricultural activities dominate economic activity along the transverse valleys which provide access to many of the mountainous mineral deposits. Many historical settlements were located in close proximity to the villages of the indigenous *Diaguitas*. A high percentage (70–75%) of inhabitants are of Mestizo (Euro-Amerindian) background, higher than any other region in Chile.

High growth rates are documented in the La Serena-Coquimbo population corridor (est. 300,000 inhabitants), which constitutes 50% of the regional population. Other major cities (according to the 2002 census) include: La Serena (148,815), Coquimbo (148,438), Ovalle (66,405), Illapel (21,826), Vicuna (12,910), Salamanca (11,615) and Los Vilos (10,966). This region is a popular tourist destination owing to the extensive beaches, mild climate, fishing, agriculture and mining.

The Choapa Province is one of the 3 provinces making up the Coquimbo Region of Chile. It has an area of 10,079.8 km² and a population of 81,681 (51% men) resulting in a population density of 8.1/km². The Choapa Valley is located 400 km (250 mi) north of Santiago, in the southern part of the Region of Coquimbo.

This area is within the narrowest part of Chile, where the Andes meet the Coastal range. The small valley consists of two sectors, Illapel and Salamanca. There are no wineries in any of these sectors, but vines planted on the rocky, foothill soils produce small quantities of high quality Syrah and Cabernet Sauvignon grapes with high acidity and low pH, which is increasing the interest for the area among many wine producers. Only one brand of wine, De Martino Syrah, currently holds the D.O. of “Choapa Valley” (Wikipedia, 2023). Over the past several years, avocado (palta) orchards are appearing in the hills flanking these valleys and suggest the emergence of an important industry.

Illapel is the capital of the Choapa Province and serves as the economic and logistical base for the Illapel project. It lies along the Illapel River and marks the country's narrowest point along a parallel (94 km). From an administrative perspective, Illapel is a third-level administrative division of Chile administered by a municipal council and headed by an alcalde (mayor) who is directly elected every four years.

Since 2002, Illapel has grown to about 30,000 inhabitants and provides a fairly complete spectrum of non-specialized services and enough to meet the requirements of Vortex Metal's Illapel project in terms of labor, services and accommodations.

5.4 Local Resources and Infrastructure

The Illapel Copper project does not host any infrastructure to support the proposed activities. The project can be easily reached within 45 minutes of the community of Illapel

where most services, including medical, can be found. Illapel serves as the host community for several mines, including the Los Pelambres copper deposit, providing residence and services to a variety of skilled workers for the mining industry.

The Rio 27 mine utilizes diesel generators for services. The power grid, the Central Interconnected System, (SIC), passes about 6.5 km from the mine. Chile provides industrial consumers a tax facility that allows for the purchase of energy at the same price paid by SIC, the regional utility company.

Owing to Central Chile's dry climate, water is always an issue. Currently, the Rio 27 mine can provide water from dewatering of the deeper workings and other nearby workings which have encountered water at shallow depths. The mines, such as Los Pelambres and El Espino (in development), rely on seawater and pump up to 100 km from the ocean following desalination.

Owing to the importance of mining in the Chilean economy, mining personnel and services for all stages are available locally, regionally and nationally. The extensive land position of the Illapel project, and in particular the Exploitation Concessions, provide several options for the location of important infrastructure, if warranted, including tailings storage and waste disposal sites, processing plant, and mine/camp/administrative facilities. The right to construct these facilities is implicit in the mining law within established governmental guidelines.

Section 6.0 History

The Illapel project is situated immediately east of, and geologically distinct from, the Farellon Sanchez district (FSD) which comprises an extensive area of copper-gold-bearing quartz veins hosted in the Illapel Batholith and surrounding volcanic and volcano-sedimentary rocks. The extent of the workings, and widespread vein exposures, suggests that the FSD may have been exploited since the 1800s. It is noteworthy that the FS district lacks any modern infrastructure, drainage tunnels, shafts, rail lines, etc. and, in addition, vein exposures indicate very selective mining. All of this suggests a long history of artisanal mining in the FSD which continues to this date.

In contrast, exploration and mining activity within the Illapel project area appears to have been limited to a few small surface operations and widespread prospect pits. There is no record of exploration or mining within the Illapel project area prior to 2008 per representatives of Ventana Minerals (holding company of Windows Mineral and SLM Rio 27). In late 2008 to early 2009, Msrs. Paul Hurst and Jose Manuel Mendez (Ventana Minerals) were invited to participate in mining concessions adjacent to the Farellon Sanchez district; the concessions contained a few, small historical workings, no access roads and considered to be a Greenfield project. One area, with prospect pits, hosted visible copper oxides and sample results revealed "high-grade copper

values”. From these results, Ventana constructed several kilometers of road from the east side of the Farellon Sanchez district to the current site of the Rio 27 mine.

For the first few years, they extracted surface copper mineralization with a track-mounted excavator and sold the mineral directly to ENAMI (National Mining Company) with an average copper value greater than 5% Cu. This initial site was the surface expression of the ‘Bolson Sur’ deposit currently being exploited in the Rio 27 mine. Once the founders of Ventana Minerals reached a depth of 10 or so meters, slope stability became an issue. At this depth it became apparent that the mineralized zone was vertically inclined and it was decided to enter the zone with an adit a short distance below the ‘discovery outcrop’. Following some initial difficulties, Ventana decided to hire a mining engineer with experience in underground mines and they developed an exploration and exploitation program and presented it to SNGM (National Mining & Geology Service), a government agency that oversees mining. The plan was to work the southern area beneath the initial diggings and simultaneously explore and exploit the Rio 27 structure.



Figure 6.1. View of the 100 Level portal.

The axis of the SLM Rio 27’s mine area is defined by the Rio 27 north-northeast-trending structure which hosts Cu grades over 2% across a 2- to 5-metre-wide structure. Access into the zone via the 100 Level adit identified this structure and followed it to the south into the first significant deposit, the ‘Bolson Sur’, which initially measured about 40 meters long and 20 meters wide where 4 levels

have been developed and exploited. Simultaneously, Ventana continued advancing along the Rio 27 structure to the north where copper grades were sufficiently high to pay development costs. After following a fracture zone exceeding 2% Cu, the 'Bolson Norte' was encountered with a length of 100 meters and a width of 80 meters. Six exploration and development levels have been established on about 25 meters centers leaving pillars of about 12 meters. In the past few years, Ventana decided to remove these pillars via a sub-level stoping method. Currently, the mine is opened by 3 adits allowing access for their rolling stock and mining personnel; Ventana has developed about 7 kilometers of tunnels and ventilation shafts.

The existing permit with ENAMI allows the extraction of up to 3,000 tonnes per month. To date, approximately 400,000 tonnes of mineralized material with an average grade of 1.39% copper has been processed by Ventana. Aside from the very limited data provided by Santiago Metals following their review in 2015, there is no sample data available nor geologic maps for the mine. Numerous copper prospects have been defined on the basis of copper staining and without geochemical sampling.

Essentially all work conducted by Ventana Minerals has been via SLM Rio 27 at their Rio 27 mine and within the Rio 27 concession and outside of the Illapel project area. Prospecting, along with minor development, has been done at several areas with a track-mounted excavator by Ventana Minerals. Several mineralized exposures, defined by copper staining, have been partially excavated and provided some 'mill feed' to the plant in Illapel. Examples of this work can be observed at the Nueva Esperanza, Andacollo and Callejas mines north of the Rio 27 mine. Additionally, the operators have opened much of the property with roads providing good access to several prospects. Regardless, the Illapel property does not host a mineral resource estimate nor is there any production from the Illapel project area.

Section 7.0. Geological Setting and Mineralization

7.1 Regional Geology (adapted from Orrego, 2012)

The segment between 27° and 33°S in Chile is characterized by a Mesozoic-Cenozoic magmatic arc built mostly over a Late Paleozoic to Triassic accretionary prism and arc along a subducting margin. The Mesozoic Andean evolution was characterized by a Jurassic-Early Cretaceous magmatic arc accompanied by a sedimentary back-arc basin and an aborted marginal basin followed by a Late Cretaceous magmatic arc with a fold and thrust belt to the east (Figure 7.1). The Jurassic-Early Cretaceous magmatic arc comprised coeval inner and outer arcs developed in the present Coastal Cordillera and in the Chile-Argentina border, respectively (Mpodozis and Ramos, 1990). The Illapel project is located at the eastern margin of this inner magmatic arc.

The Early Cretaceous was marked by an extensional regime, marine transgression, a decrease of plutonism in the Coastal Cordillera and extensive subaerial volcanism—with marine intercalations associated with intra-arc rifting (Vergara et al., 1995). The volcanic rocks are high-K, calc-alkaline to shoshonitic basaltic andesite to andesite. Isotopic studies suggest that the volcanic rocks and coeval intrusive rocks were derived from depleted mafic magmas and metasomatized subducted sediments with inclusion of partially melted Jurassic plutonic rocks (Morata and Aguirre, 2003). These rocks underwent high subsidence and low-grade burial metamorphism concurrent with extension-related plutonism (Levi and Aguirre, 1981).

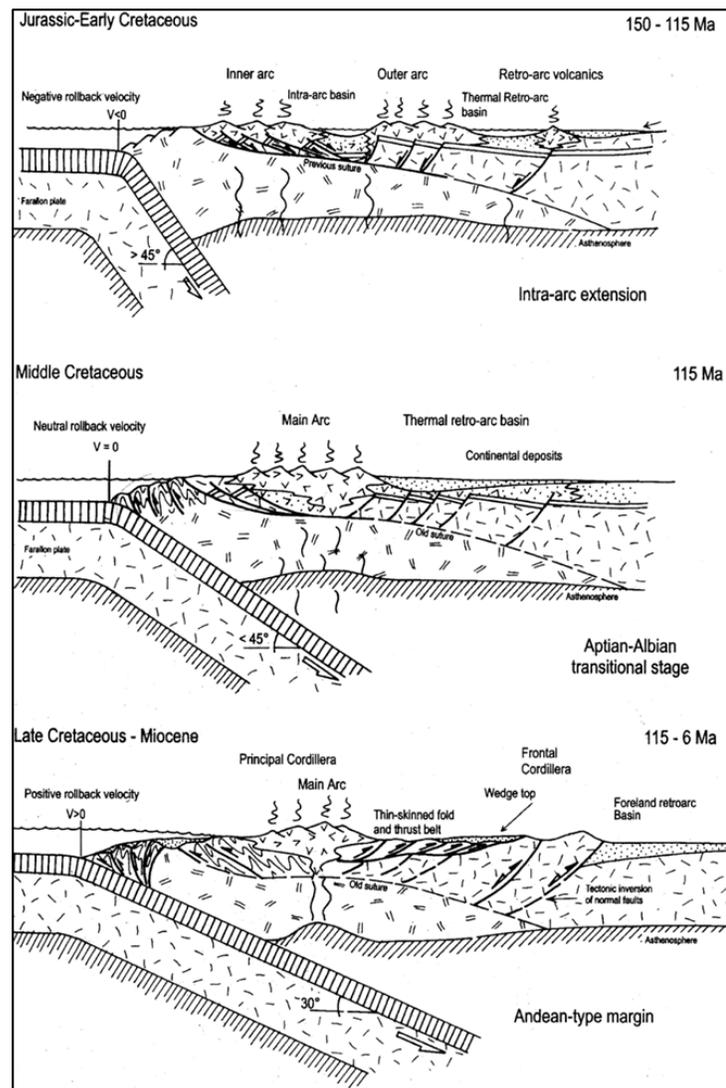


Figure 7.1 Tectonic setting in the Andes segment between 27° and 33° latitude S, showing the change from extensional to compressional tectonic regime at the end of the Early Cretaceous (modified after Mpodozis and Ramos, 1990).

At approximately 100 Ma, the tectonic regime shifted from extensional to compressional between 32-33° lat. S, resulting in crustal shortening, basin closures, eastward migration of magmatism and uplift (Arancibia, 2004; Parada et al., 2005). The change from extensional to compressional tectonics has been attributed by Arancibia (2004) to higher spreading rates in both the southeast Pacific and the south Atlantic (Wilson, 1992). Rapid uplift of the Coastal Range in this portion of Chile has been documented by apatite fission track data from Jurassic and Early Cretaceous plutonic rocks that cooled to approximately 80-125°C by 110-90 Ma (Gana and Zentilli, 2000).

The Early Cretaceous Arqueros and Quebrada Marquesa formations, which are the likely host rocks for the Illapel copper deposits, were deposited in the Coastal Range region between 30° and 32°S. The Neocomian Arqueros Formation consists of lava, volcanic breccia, tuff, and agglomerate with lenticular intercalations of conglomerate, sandstone, and locally thin fossiliferous limestone. It has an estimated thickness of 3,500-4,000 m and is interpreted to have formed near a continental margin with associated volcanic activity and recurrent marine transgressions (Aguirre and Egert, 1965). The Barremian to Albian Quebrada Marquesa Formation consists of mixed volcanic and sedimentary rocks (Aguirre and Egert, 1965). The formation was subdivided in two members: the lower Espino Member and the upper Quelen Member (Rivano and Sepulveda, 1991). The Espino Member consists of limestone, siltstone, sandstone, and conglomerate with local gypsum lenses. Vertical and lateral facies variations of the Espino Member made it difficult to define a representative stratigraphic column. The Espino member is interpreted to have been deposited in relatively small marine to transitional basins with sea level variations (Rivano and Sepulveda, 1991). The Quelen Member, with estimated thickness of 1,200 m, consists of reddish colored volcanoclastic and sedimentary rocks including lava, pyroclastic breccia, and volcanically-derived sandstone and conglomerate. The Quelen member represents deposition in a continental environment accompanied by intense volcanism.

Infill of basins in the Espino-Illapel region continued into the Late Cretaceous with deposition of the Salamanca Formation. The Salamanca Formation is preserved from the Coastal Range up to the Main Cordillera and ranges in thickness from approximately 3,500 to 4,000 m. The formation is subdivided into two units: lower Santa Virginia Member and upper Rio Manque Member (Rivano and Sepulveda, 1991). The Santa Virginia Member consists of conglomerate and red, hematitic sandstone with minor siltstone and lacustrine limestone intercalations. These sedimentary rocks are interpreted to have been deposited as alluvial fans and debris flows with finer-grained sediments deposited in the basin center. The overlying Rio Manque Member consists of tuff and volcanic breccia; it represents deposition during a period of intense and explosive volcanism at the end of the Cretaceous (Rivano and Sepulveda, 1991).

Cretaceous intrusions cover an area of approximately 3,000 km² along the Coastal Range between 31° and 32°S. This area contains three large plutonic bodies (Llahuin, Illapel-Caimanes, and Quilitapia-El Durazno) and a number of smaller bodies of similar composition (Rivano and Sepulveda, 1991). The plutons include diorite, tonalite, amphibole and pyroxene granodiorite, and amphibole monzodiorite. Potassium-argon geochronology available indicates that the Quilitapia-El Durazno pluton ranges in age from 134 to 108 Ma, whereas the Illapel-Caimanes pluton ranges in age from 130 to 86 Ma and young to the east (Rivano and Sepulveda, 1991).

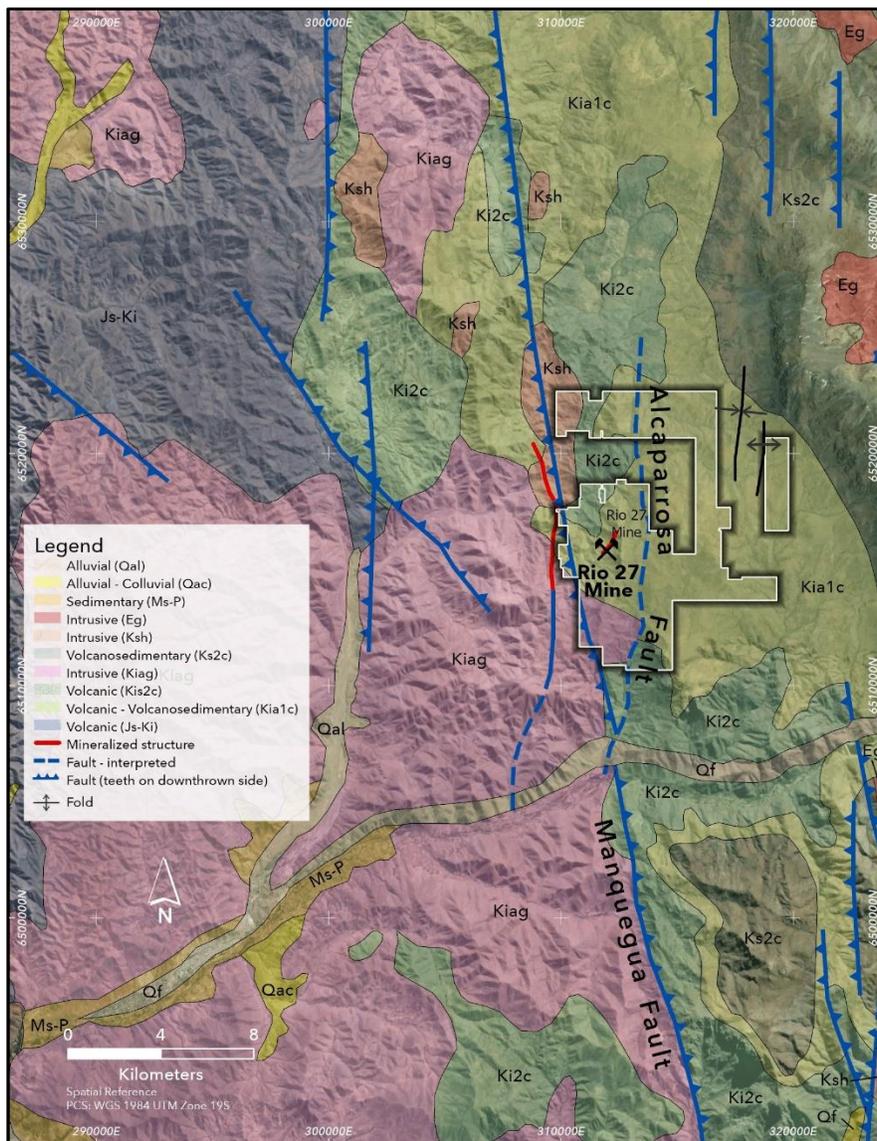


Figure 7.2 Generalized geologic map of the Illapel project and surrounding area. Note the location of SLM Rio 27’s mine.

The stratigraphic position and geochronological data indicate that the Chilean volcanic-hosted strata-bound Cu-(Ag) deposits were generated during Late Jurassic and uppermost Early Cretaceous time. The overall extensional tectonic setting, crustal thinning, active subsidence, extensional tilting of the volcano-sedimentary strata and episodic batholith emplacement within these strata during the development of the Jurassic - Lower Cretaceous magmatic arc are singular to this early stage of Andean evolution in Chile. However, it appears that distinct periods of trans-tensional tectonics facilitated shallow emplacement of batholithic masses, provided structural weakness zones for hydrothermal fluid circulation, and modified the hydraulic regime within the permeable strata of tilted volcano-sedimentary strata. The concurrence of these specific factors and probably other still unknown ingredients may account for the occurrence of two discrete periods of strata-bound Cu-(Ag) mineralization (Maksaev & Zentilli, 2002).

Lower Cretaceous volcanic rocks with marine sedimentary intercalations form a N-S-trending belt in north-central Chile that is located about 30 to 60 km east from the Pacific coast. Significant volcanic-hosted strata-bound Cu-(Ag) deposits occur within this belt, particularly in central Chile (eg. El Soldado, Lo Aguirre; Orrego, 2012) and include the copper deposits identified at Illapel. In addition, there is a distinct group of strata-bound Cu-(Ag) deposits within volcano-sedimentary strata found in intermontane basins with red-beds and carbonaceous mudstones (eg. Cerro Negro, Talcuna, Uchumi).

7.2 Project Geology

Within this regional geologic environment, the Illapel Cu-(Ag) project is characterized by a gently tilted, both westerly and easterly, volcanic and sedimentary rock package (Figure 7.3) in fault contact with the extensive Illapel batholith (Figure 7.2). The intrusive rocks are mostly constrained to the westernmost part of the project area and, in general, outside of the project area.



Figure 7.3 Looking southeast toward the Rio 27 Mine; note the westward dip (~30°) of the intercalated volcanic and sedimentary rocks.

Orrego (2012) provides a stratigraphic framework from studies conducted at the El Espino project located about 10km to the north. The Lower Cretaceous Arqueros Formation, which consists of volcanic breccia, agglomerates with fossiliferous limestone lenses, sandstone and conglomeritic units, are the oldest stratified rocks in the Illapel project area. Concordantly overlying this unit is the Lower Cretaceous Quebrada Marquesa Formation and consists of two members: 1. The lower El Espino member composed of calcareous sediments including sandstone, conglomerate, marl, limestone and gypsum; and 2. The upper Quelen member of volcanic origin and composed of andesite and lithic tuffs. Discordantly overlying this unit is the Salamanca Formation of Upper Cretaceous age and consists of the Santa Virginia and Rio Manque members. The basal Santa Virginia member is principally composed of conglomerate and sandstone with subordinate limestone beds. The overlying Rio Manque is dominantly volcano-sedimentary in origin and composed of andesitic breccia and flows along with rhyolitic tuffs (Araya, 2009). Murillo (2015) provides a similar stratigraphy and ages but employs different formation nomenclature. Currently, these units are not defined within the project area, including the Rio 27 mine, which should be one of the initial goals in the proposed geologic mapping.



Figure 7.4 Photo of ocoite boulder observed south of the Rio 27 mine.

7.3 Project Mineralization

Visits to the Rio 27 mine, owned by SCM Rio (see Section 14.0), by the Author identified a broad range of lithologies hosting copper mineralization. Disseminated and fracture-controlled copper minerals, both secondary and primary, were observed in sedimentary (sandstone, arkose and conglomerate) and volcanic (flows, tuffs and dikes) rocks showing varying degrees of silicification, hematization and chloritization. Copper minerals tentatively identified include: chalcocite (Cu_2S), bornite (Cu_5FeS_2), chalcopyrite (CuFeS_2), malachite and azurite (copper carbonates). Similar styles of mineralization and alteration have been observed at the other surficial copper occurrences throughout the Illapel project.

The Rio 27 mine, which is the only three-dimensional exposure of copper mineralization within or adjacent to the Illapel project, provides additional details on the scale and geometry of the deposits. In Figure 14.2, two mineral geometries have been identified: 1. Planar and along the Rio 27 structure. Widths are 2 to 5 metres and the horizontal and/or vertical limits have not been defined. 2. Sub-vertical chimney-like bodies up to 40 metres wide (perpendicular to the Rio 27 structure) and ~100 metres long. The vertical dimension cannot be determined as the lowermost workings remain in mineralized rock but this dimension is a minimum of 125 metres. The geometry of the later mineral geometry is clearly related to the intersection of two structural trends, $\text{N}30^\circ\text{E}$ and $\sim\text{EW}$. Within these

two envelopes, the mineralization appears to be continuous but the absence of geologic maps and rock samples preclude their definition.

Despite the absence of geologic maps, samples and drill holes, the mine workings clearly follow a structural trend (~N30°E) defined by the Rio 27 fault. The fault is not well defined but, instead, appears to be a corridor of semi-parallel structures creating a somewhat sinuous ‘crackle’ zone. Exposures within the Rio 27 mine, along the surface projection of the Rio 27 structural corridor and elsewhere throughout the project area, reveal a spatial association between copper concentrations (i.e. bolsones or chimneys) and transverse structures. The transverse structures are commonly occupied by “ocoite” dikes which are a type of basaltic andesite intrusive with a coarsely porphyritic texture (plagioclase crystals greater than 1 cm in length; Figure 7.4; Vasquez, H.L., 2020), Ocoite was originally described to characterize rocks from the Ocoa member of the Veta Negra Formation of Lower Cretaceous age in the Valparaíso region. Rocks of similar composition and textures have also been described southeast of Copiapó, where they are associated with extensional tectonics. Furthermore, in the regions of Valparaíso and Copiapó, the ocoites host ‘stratabound’ deposits of Cu-Ag (Vasquez, 2020).



Figure 7.5 View (looking south) of the Ventana veins; note broad zone of veins forming a ‘sheeted vein’ complex up to several metres wide; Samples 008 and 009 were collected from this area.

Southwest of the Rio 27 mine (Figure 7.1), a distinct mineral style occurs at the Ventana I and II veins. In contrast to the copper mineralization of the Rio 27 mine and neighboring occurrences, these veins are enriched in gold and copper hosted by quartz-calcite-barite similar to veins observed in the Farellones Sanchez district and are likely part of that

district. There is little information on these veins but their appearance is more characteristic of low- to intermediate-sulphidation epithermal veins, and likely associated with ore fluid boiling, given the lattice texture observed in the vein exposures.

Section 8.0 Deposit Types

Strata-Bound Copper Deposits

Strata-bound copper deposits with subordinate silver, long known as ‘Chilean Manto-type’, occur along the Coastal Cordillera of Northern Chile (north of Santiago, 34°S) and form an economically important cupriferous metallogenic belt. Similar types of deposits in North America are named “volcanic red bed” and are distributed principally in the northwest Canada and in northern Michigan (Kojima et al, 2008). Two groups of significant strata-bound Cu-(Ag) deposits occur in Chile: 1. From 22° to 26° S latitude hosted by a Jurassic volcanic sequence (La Negra fm.) and 2. From 30° to 34° S latitude by lower Cretaceous volcanic and volcano-sedimentary rocks. The Illapel deposit falls into the second class of ‘manto-type’ deposits (Orrego, 2012).



Figure 8.1 Location of copper deposits in central Chile.

The largest Cu-(Ag) manto-type deposit hosted in Lower Cretaceous rocks is El Soldado located in the Coastal Cordillera of central Chile, with a past production + reserves of 200 mt at 1.35% Cu. The second most significant deposit, now exhausted, was the Lo Aguirre (Figure 8.1), located immediately west of Santiago city, with 11.1 mt at 2.14% Cu (Maksaev, 2002).

Two major magmatic-tectonic stages are recognized in the geological evolution of the Andes in the northern half of Chile: 1. From the Jurassic to the end of the Early Cretaceous, when a magmatic arc-system flanked to the east by a sedimentary marine back-arc basin developed within an extensional tectonic setting, and 2. Since the Late Cretaceous to the Present, when arc-systems developed on a continental environment within an overall compressive tectonic setting. Folds and thrusts were locally developed eastward from the arc systems during the second stage (Maksaev & Zentilli, 2002). Strata-bound Cu-(Ag) mineralization was conspicuous during the first extensional stage of Andean evolution in Chile, whereas porphyry copper deposits strongly dominated the second.

The development of the Jurassic to Early Cretaceous magmatic arc along the present Coastal Cordillera was accompanied by subsidence and formation of a back-arc basin system farther east in the area now occupied by the Intermediate Depression and Domeyko Cordillera (Tarapaca Basin, Mpodozis and Ramos, 1990).

Descriptive Model

Boric, et al (2002) provide a concise definition for this deposit type,

“Among the strata-bound deposits, the copper (silver) family, also known as “mantos” or “manto-type” copper deposits in the literature, are the better understood. This family of deposits usually has a high copper grade (1.5-2% Cu), relatively low contents of silver (5-20 g/t) and are practically devoid of gold. They are hosted by Jurassic volcanic rocks in northern Chile (21°- 26° latitude S; eg. Mantos Blancos, Michilla) and by Early Cretaceous volcano-sedimentary sequences (27° to 34° latitude S; eg. Punta del Cobre, El Soldado). The most important mines of this subtype are Mantos Blancos in northernmost Chile, and El Soldado, in central Chile. The ore in these deposits is only strata-bound in a regional sense, meaning that they are epigenetic, and although the ores are restricted to certain stratigraphic units, in detail they are discordant (Figure 8.2), their orebodies are structurally controlled (Figure 8.3) or follow relatively permeable horizons in the strata. The hypogene mineralogy is relatively simple, and consists of bornite, chalcocite (+/- digenite), chalcopyrite, pyrite and hematite. The sulfide ores tend to occur in reduced (probably sub-marine) strata rather than in oxidized (sub-aerial) strata. Supergene metal enrichment related to surficial weathering, which has been significant in making some porphyry copper deposits economic, is not a main factor in the mantos, although oxidized ores are exploited in many. Gangue minerals are relatively scarce and the effects of hydrothermal alteration are difficult to distinguish from low-grade regional metamorphic assemblages.”

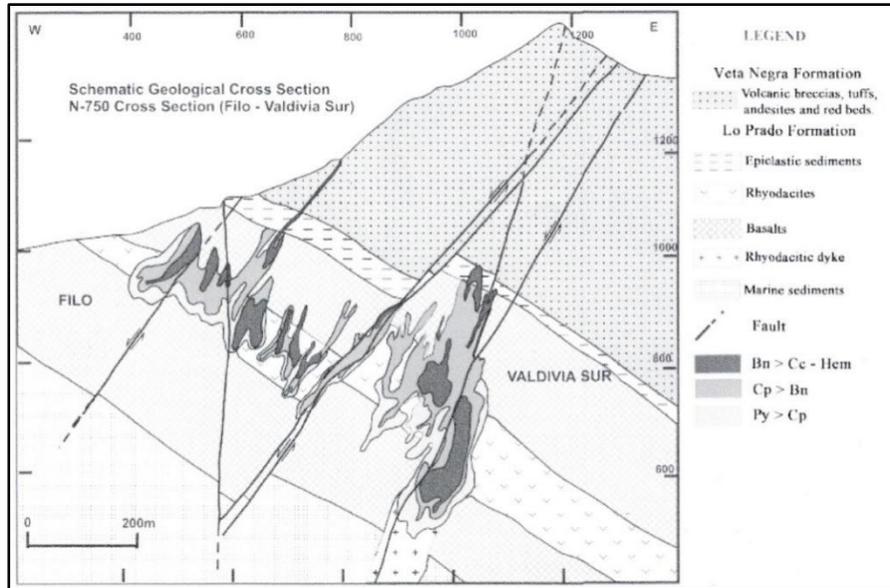


Figure 8.2: Cross-section at the N-750 coordinate, El Soldado mine. Note the structurally controlled copper deposits but overall stratabound nature of the orebodies within the upper member of the Lo Prado Formation (from Boric, et al, 2002).

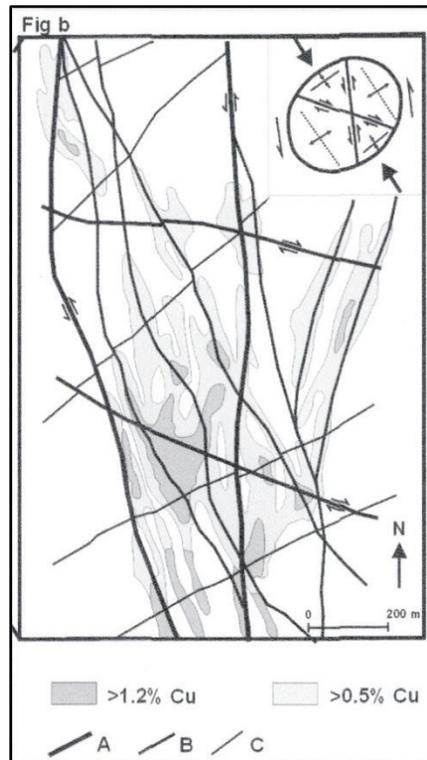


Figure 8.3. Generalized structural plan of orebodies: A: Main shear faults; B: Secondary Faults; C: Fractures. Inset shows hypothetical model of conjugate faults in response to a sinistral wrench system with a regional NNW (horizontal) main stress axis (from Boric, et al, 2002).

Hypogene ore minerals are chalcopyrite, bornite, and chalcocite that occur as dissemination and veinlets, largely filling primary and secondary porosity of the volcanic host rocks. According to Boric (1997) many individual orebodies in a block show a mineralogical zoning: a core of chalcocite-hematite or chalcocite-bornite-hematite is followed outward by approximately concentric zones of bornite-chalcopyrite, chalcopyrite, and pyrite in the most external zone (Figure 8.2). The deeper roots of the orebodies contain relatively more pyrite than their upward terminations. Although oxidized copper zones exist near the surface and mixed ores were exploited, supergene enrichment is not significant. Common waste or gangue minerals are pyrite, hematite, magnetite, calcite, chlorite, albite, microcline, bitumen, and minor amounts of sphalerite, galena, and arsenopyrite. The copper grade is extremely variable (Klohn et al., 1990). Lateral limits of the orebodies are characterized by abrupt changes of Cu grade from a nucleus at about 2% Cu to marginal zones at 1.2-0.5% Cu within a few metres (Ruge, 1985, Klohn et al., 1990). The wall rock between the orebodies is generally barren (<0.15% Cu, Klohn et al., 1990). Hydrothermal alteration consists of abundant calcite, chlorite, albite, microcline, epidote, opaline silica, titanite, and rutile-anatase, and some sericite and clay minerals, with primary rock textures largely being preserved (Boric, 1997).

Genetic Model

Boric, et al (2002) define the deposit genesis (at El Soldado) in two stages: **Stage I diagenetic stage** of rock preparation and deposition of low-temperature pyrite, probably related to petroleum migration, and **Stage II hydrothermal phase**. An intervening metamorphic stage can be assumed, involving the burial of the sequence until the time of batholith emplacement.

The presence of petroleum as a liquid in the upper Lo Prado Formation, and the formation of framboidal pyrite with the assistance of bacteria suggest that the Stage 1 temperature was less than 100°C. The source of oil was the dark shales of the lower member of the Lo Prado Formation; it migrated upwards through extensional normal faults that must have been active during sedimentation and volcanism that filled the basin, and probably represent growth faults, which were later reactivated during Stage II. Permeability was provided by primary porosity such as columnar jointing, syn-volcanic breccias, inter-particle spaces in coarse volcanoclastic rocks, vesicular zones in basalts, and secondary fracture porosity related to faults. The uppermost tuffaceous unit of the Lo Prado Formation acted as a relatively impervious cap for the petroleum reservoir.

After petroleum solidified and fractured as it shrank, calcite crystallized in the open spaces. This calcite (as the carbon isotope data show) was in part generated by the oxidation of organic matter. The diagenetic stage must have developed between deposition of the volcanic host rocks at ca. 130 Ma, and peak metamorphism, although calcite precipitated after solidification of the bitumen, probably at temperatures above 100°C, consistent with the minima for homogenization temperatures of fluid inclusions.

During the diagenetic and metamorphic stages, redistribution of alkalis in the rhyodacites formed interstitial K-feldspar with argon dates of variable age, but averaging ca. 110 Ma.

During Stage II, temperatures peaked to 300-350°C, probably soon after intrusion of the Cretaceous (Illapel) Batholith, and the age of mineralization is probably close to 103±2 Ma, based on the ages obtained for adularia associated with copper sulfides (Wilson and Zentilli, 1999) and is consistent with ⁴⁰Ar/³⁹Ar dates from nearby copper deposits. Apatite fission track dating suggests rapid cooling and exhumation, such that by 90 Ma the rocks had cooled to ca. 100°C and were never substantially reheated.

In addition to the age and duration of the ore-forming process, the El Soldado genetic model (Boric, et al, 2002) considers the possible source(s) of fluids, metals, sulfur, gangue constituents, of energy, the fluid transport mechanism and the fluid focusing through the deposit, the conditions and controls of precipitation in the ore deposit, and post-ore modifications:

The diagenetic pyrite precursor turns out to be a fundamental prerequisite for mineralization at El Soldado. Isotopic studies indicate that sulfur was derived from low-temperature (probably bacterial) reduction of sulphate in the pore waters. Because iron is not easily transported in oxidized waters, iron for the pyrite was most likely derived from fluids accompanying the petroleum in their rise through the basinal normal faults. This concept is totally consistent with the Re-Os data on (diagenetic) pyrite (Ruiz et al., 1997). Copper was preferentially precipitated where it could replace pyrite, and chalcopyrite and the subsequently replacing sulfides recycling the sulfur and incorporating it into their structure (Wilson et al., 2002). Little sulfur appears to have been added during Cu mineralization.

The growth of specularite locally at El Soldado, locally associated with pyrite, seems to have preceded the introduction of Cu. This suggests that the first pulses of hydrothermal brines did not carry significant Cu, nor sulfur, to create sulfides. This part of the paragenesis remains doubtful (Borac, et al, 2002).

Sulphur was inherited wholesale from diagenetic pyrite during the hydrothermal stage based upon isotope ratios in pyrite and Cu sulfides. The source of the Cu is speculative, but as has been suggested for other sediment-hosted copper deposits, i.e. northern Michigan and British Columbia. It is most likely that the Cu was extracted during prograde low-grade metamorphism from the oxidized Veta Negra Formation mafic and intermediate volcanics, volcanoclastics and red beds.

The solutions that transported the Cu were high-salinity brines (21-26% NaCl). The presence of chlorine has been detected within the bitumen associated with high grade Cu ores (Wilson, 1998; Wilson and Zentilli, 1999). Eh-pH relationships allowing for the precipitation of chalcocite-covellite-hematite assemblages must have been highly oxidizing, and mildly acidic

at ca. 300°C. The oxygen and carbon isotope data, the strontium isotopes and the presence of atmospheric argon in the alteration and gangue K-feldspar (adularia) are compatible with the fluids having been connate, in part meteoric waters within the subaerial volcanic Veta Negra Formation, in partial equilibrium with the rocks during prograde metamorphism, which culminated with peak temperatures during intrusion of the batholith.

The energy source for fluid migration may have been the tectonic tilting of the strata and the intrusion of the huge Cretaceous batholith. Focusing was provided by the development of a brittle shear system parallel to the Andean margin in response to oblique subduction (eg. Maksaeu and Zentilli, 2002) generating trans-tensional regimes. The reactivation of pre-existing normal faults and the resulting fracturing generated structural permeability in vertical zones thus attracting and channeling large volumes of hot, Cu-rich brines into the more brittle lithologies of the Lo Prado Formation, such as the rhyodacites, from the overlying Veta Negra Formation.

The access of Cu-rich, oxidized chloride brines to zones with pyrite accompanied by still-reactive bitumen, which acted as active carbon to destabilize the chloride complexes (Wilson and Zentilli, 1999), led to the progressive replacement of the pyrite by Cu sulfides. The replacement of pyrite by chalcopyrite only requires the addition of Cu, but any further replacement by Cu leads to an excess of Fe, which results in the co-precipitation of hematite.

As indicated above, after ore formation and batholith intrusion, the region underwent rapid cooling and exhumation during inversion of the Cretaceous Basin at 82-95 Ma. Supergene oxidation at El Soldado has been minimal and supergene enrichment has not been significant. The lack of sufficient pyrite to generate sulfuric acid during oxidative weathering, the presence of reducing bitumen, and of abundant calcite to neutralize any acid formed, have worked against supergene enrichment (eg. Gonzalez and Holmgren, 1993).

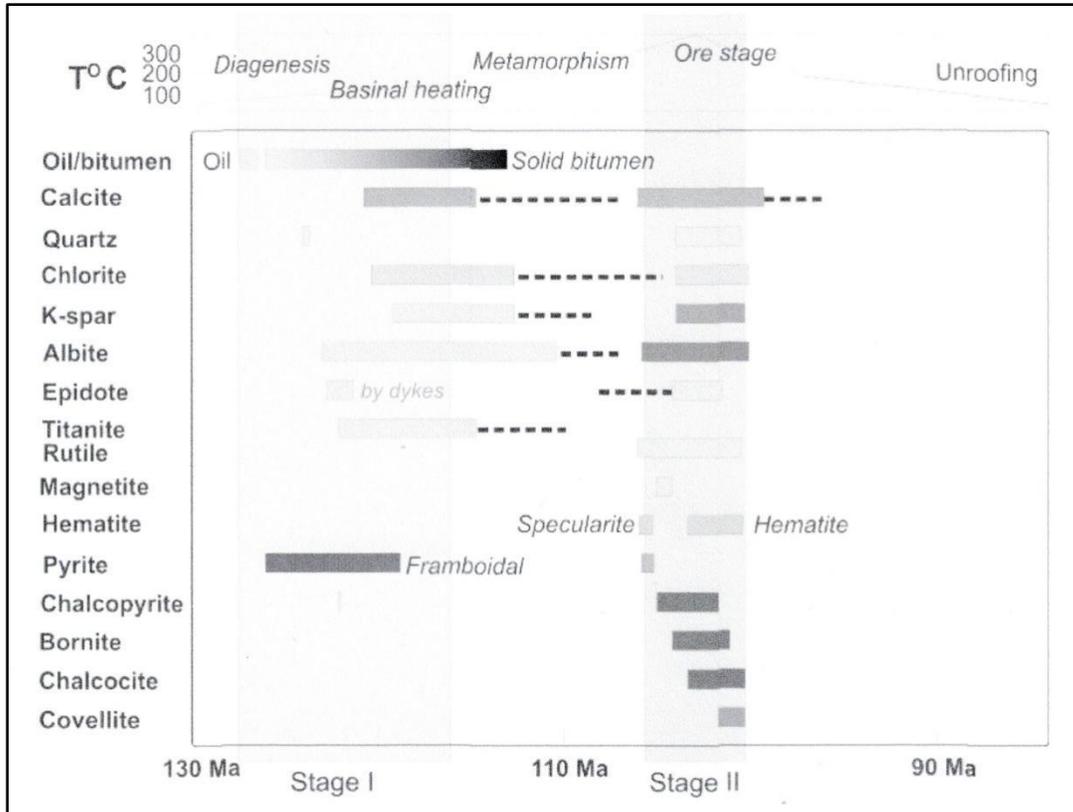


Figure 8.4. Generalized paragenesis for the El Soldado ore deposits. Temperature and time scales approximate only. Dashed lines indicate high uncertainty. The most significant minerals are indicated in black (from Boric et al, 2002).

Exploration Model

In their dissection of the El Soldado large, manto-type deposit, Boric, et al (2002) identified several deposit characteristics that should be included in the exploration model and considered in the design of the exploration program at Illapel.

1. **Pyrite and bitumen.** Copper minerals replaced pre-existing pyrite, which developed within a degraded petroleum reservoir, probably through the interaction of sulfur reducing bacteria, at temperatures below 100°C (Wilson and Zentilli, 1999). Also, petroleum migration and pyrite growth preceded tilting of the strata (Wilson and Zentilli, 1999; Wilson et al., 2002). Therefore the locus for pyrite within the potential petroleum reservoir could extend long distances down dip and to the east (of El Soldado). Solid bitumen acted as a reductant for hydrothermal solutions and probably destabilized chloride complexes carrying copper (Wilson, 1998).
2. **Structural Permeability.** Early formed extensional faults controlled the migration of petroleum and localized the formation of the essential pyrite before and during petroleum migration. Later remobilization of these faults and development of a sinistral strike-slip

regime with a trans tensional zone (cymoid loop) responding to a horizontal maximum principal stress σ_1 oriented NNW-SSE. The best extensional structures should have an orientation somewhat parallel to the above, and the permeability zones formed should have a sub-vertical extension, parallel to the intermediate stress direction (eg. Sibson, 2001). Within this brittle regime, the most favorable rock types for ore are the brittle rhyodacites, and basaltic lavas of the upper member of the Lo Prado Formation, whereas the more ductile tuffaceous units and fine-grained clastic sediments are relatively less favourable (eg. Klohn et al., 1990).

3. ***Calc alkaline Volcanics.*** Boric et al (2002) emphasize that alkaline magmatism reported at El Soldado are, in fact, metasomatized calc-alkaline rocks; trachyte is a metasomatized rhyodacite; the andesite is in fact basalt. The alteration of these rocks has given them characteristics of keratophyres and spilites. The same effects are recognized in the Punta del Cobre - Candelaria district (Marschik and Fontboté, 1996).
4. ***Cu-related Albitization.*** Hydrothermal Cu mineralization is associated with an increase in Na related to albitization and a depletion in K in host rocks. Nevertheless, there are localized zones of K increase in bornite-chalcocite assemblages near structures, where K-feldspar has precipitated as adularia.
5. ***Magnetite Destruction.*** The complete disappearance of magnetic susceptibility in basalts as they approach mineralized bodies resulted from sulfidation of the magnetic minerals, and should be a useful empirical tool in logging and geophysical exploration.
6. ***Connate Basinal Brines.*** The El Soldado deposit is epigenetic, but the fluids that formed it were not magmatic. The data available suggest that the fluids were highly saline connate basinal brines, modified by prograde, very low-grade metamorphism, but with a significant component of meteoric water. Evaporites may have been involved, although they have not been recognized in the basin.

The genetic/exploration model developed at the El Soldado copper deposit can be employed at Illapel as well as along the western Cordillera of Chile. The regional components of the model are clearly present at Illapel including calc-alkaline volcanic rocks, extensional tectonics, sedimentary source rocks, and regional batholith. The recognition of these deposit characteristics may define a path toward important discoveries at the Illapel Copper project.

Section 9.0 Exploration

Systematic exploration has not been conducted over the Illapel project area by the Vendors nor the Issuer. A brief report, "Preliminary Geologic Report – Rio 27 Project (Cu-Ag)" was prepared by F. Murillo in 2015 for Santiago Metals LTDA, and was prepared to define prospectivity of areas controlled by Ventana Minerals for Cu-rich manto-type deposits. Only a minimal amount of data from this work has been made available.

As many 'small miners' SLM Rio 27 does not maintain a sample database nor conduct geologic mapping for the Rio 27 mine. The mine is currently operating by 'visual inspection' of the rock to determine the amount of copper-bearing sulfides, i.e. chalcocite, bornite and chalcopyrite; confirmation of copper occurs when concentrates are sold. When analytical work was required, Ventana Minerals utilizes a non-compliant laboratory located in Illapel; none of this analytical data is reported here. Nonetheless, the mine is producing copper and copper grades are determined by the amount of material delivered to the plant (mill feed) versus the tonnes and copper grade of the concentrate sold. Figures provided to the Author by Ventana Minerals reveal that the Rio 27 mine is currently producing about 300 TPD at 1.39% Cu; this has not been confirmed. On February 22, the Author collected a sample of the concentrate at the Illapel plant; the sample contained 35.2% Cu and 151 ppm Ag.

The following is a brief summary of the work conducted by Santiago Metals (2015) which served as a 'field guide' to the Author; several of the areas visited by the Author in February 2024 were considered to be high-priority targets by Santiago Metals in their independent evaluation of the district. Despite the complete independence of the conclusions drawn by this Author, on behalf of Vortex Metals, and Santiago Metals in 2015, their stated priorities are consistent with the Author's observations.

Nueva Esperanza Target (Area #1)

The strongest surface mineralization was recognized north of the Rio 27 mine at the Nueva Esperanza target area. A system of veins and veinlets trending NW-SE and subordinate WNW-ESE veins forming an area of at least 120 m in length by 50 to 100 m in width. The veins range in width from 0.15 m to 1.5 m forming a branching network over a strike length exceeding 100 metres. One sample collected at the Nueva Esperanza site contained 5.32% Cu and 44 ppm Ag. Additional sites of copper mineralization have been documented further to the NW (Figure 9.1) and trend N20°W, 70° NE. Here, a 0.80 m thick vein-like zone consists of copper oxides as veinlets and disseminations within a broader zone of lesser copper oxides up to 15 metres wide. A series of roads in the area will allow for the immediate drill testing of this area at a few elevations.

South Rio 27 Mine Target (Area #2; Figure 9.1)

Immediately south of the Rio 27 mine there are several minor occurrences of copper oxides with similar characteristics as observed over the mine area or to the north at the Nueva Esperanza area. Two of these occurrences appear to be the southern extension of the mineralized Rio 27 fault or parallel structures. The identification of a mineralized zone, hosting bornite-chalcocite-chrysocolla, following the Rio 27 trend and located about 0.5 km SW of the Rio 27 mine, supports the possibility of copper mineralization continuing to the south. As noted to the north of the mine, road access into this area will allow for immediate drill testing.

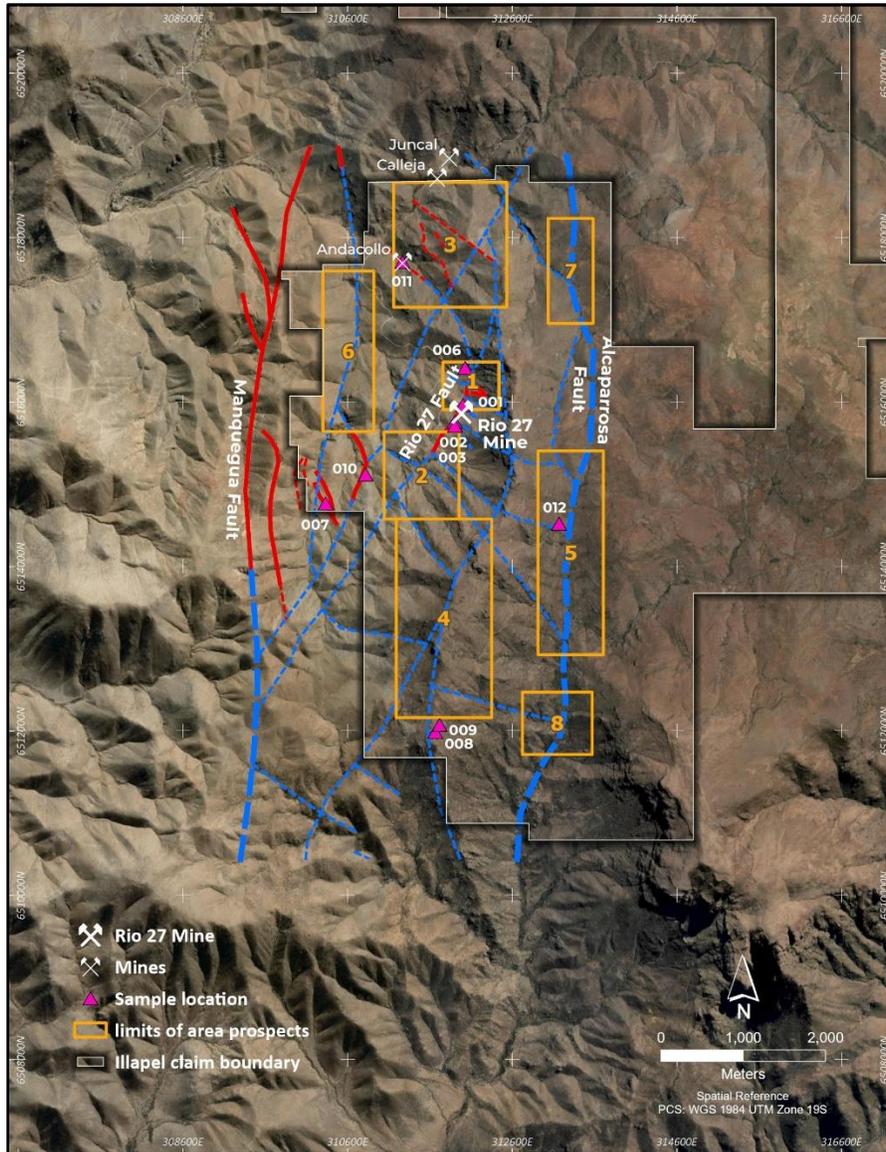


Figure 9.1. Central part of the Illapel concession block showing showing areas identified in 2015 by Santiago Metals and samples collected by the Author in 2024.

Ventana IV Target (Area #3; Figure 9.1)

An area located about 2 km NNW of the Río 27 mine hosts a mining operation where two vein systems, NNW and WNW, intersect with mineralized exposures up to 0.50m wide (Figure 9.2). Surface veinlets are less than 2 cm thick and can be traced up to 140 m along strike. The veinlets consist of limonite-goethite-chrysocolla-chalcocite in crystal tuff or silicified diorite (Figure 9.3). In a ravine east of the workings, an area of strongly silicified and chloritized volcanic breccia was observed. The breccia measures approximately 40 m long by 20 m wide and hosts sporadic veinlets of calcite-chalcocite-chrysocolla. One sample collected from an outcrop at the Andacollo mine consisted of a gossanous mix of iron and copper oxides with 0.5% Cu and 5 ppm Ag.



Figure 9.2 View of the artisanal workings (currently active) at the Andacollo mine located in the Ventana IV target area. Note copper and iron oxides on rock surfaces.



Figure 9.3 Stockpile at the Calleja mine revealing copper oxides after chalcocite + bornite.

South Rio Area (Area #4; Figure 9.1)

Santiago Metals did not comment on this area but the Author collected two samples (008 and 009) from a broad zone of copper oxides hosted by andesitic flow breccia in close proximity to a several meter wide ocoite dike. There are numerous prospect pits here dug on the copper oxides and the area is immediately adjacent to a road. Two grab samples from small piles adjacent to surface pits contained 3.75 and 4.7% Cu and up to 58 ppm Ag. The extent of this zone is not known and may continue to the north and east toward the Alcaparrosa fault (Figure 9.1).

The Ventana Veins (Figure 9.1)

The Ventana Veins sector is located 1 km southwest of the Río 27 mine and consists of two vein systems, Ventana I and Ventana II. The northernmost Ventana I vein occupies a sigmoid loop-type structure over 1km and ranges in width from 0.5 to 2.7 m (sheeted vein), with its southern part trending generally NNE, and its northern part oriented to the NNW. It consists of quartz, limonite, goethite, chrysocolla and is hosted in weakly argillized to moderately silicified andesitic crystal tuff. Sample 007 was collected from vein exposures close to the road (Tables 13.1 and 13.2) and contained 0.4% Cu and 1 ppm Ag along with chalcopyrite and copper oxides.



Figure 9.4 Photo of shallow digging along the Ventana I vein. Note that excavation occurred in altered and sheared volcanic rock with quartz veinlets and copper oxides vs more massive quartz vein; Sample site 008.

The Ventana II vein consists of two subparallel veins trending N20°W/80°E and N35°W/75°E. The northern vein can be traced over a length of 450 m and displays a brecciated texture composed of limonite, calcite, goethite, chrysocolla and chalcocite. Locally, subsidiary quartz veins are present. The northern vein is hosted by crystal tuff and locally silicified to argillized ocoite. The southern vein, traced over a distance of 350 m in length ranges in thickness between 0.35 to 2.80 m (sheeted vein) and is characterized by its quartz-limonite-goethite-chrysocolla and local calcite. Sample 010 was collected across about 1.5 metres of copper carbonate-bearing quartz-barite vein in the slot trench close to the road (Figure 9.1; Tables 13.1 and 13.2) and contained 3.5 % Cu, 0.295 ppm Au and 1 ppm Ag; the sample was deeply oxidized but contained both chalcopyrite and chalcocite.

Santiago Metals identified several prospective areas along the postulated Alcaparrosa fault (Areas 5, 7 and 8; Figure 9.1); these areas are remote and will require some form of logistical support to visit and better evaluate. Murillo (2015) states that in the Lola sector, located 1.7 km east of the Río 27 mine (Figure 9.1), a sequence of andesitic volcanic breccias is intruded by diorite dikes. In the northern part of this zone, there is a N30°E structure that can be traced for over 140 m and hosts veinlets and amygdaloidal aggregates of quartz-calcite-chrysocolla-bornite-native copper. In close association with this structure is an intensely silicified diorite (dike?) up to 6 m thick and hosts calcite and calcite + chrysocolla veinlets distributed over a strike of about 140 metres. In the southeastern part of Lola sector, an intensely silicified volcanic breccia horizon was observed with iron oxide boxwork and a black to brown stain due manganese oxide or goethite. In the southern part of the zone there is a laccolithic (?) body of diorite more than 200m long by 50m wide. Locally, it is intensely silicified, accompanied by disseminated limonite-hematite boxwork and calcite-quartz-chrysocolla-chalcocite veins.

South Lola Zone (Areas #5 & #8; Figure 9.1) About 1.5 km southwest of the Lola prospect is the Lola Sur area where a 0.3m vein and lenticular zones of disseminated and fracture coating chrysocolla up to 1 m thick is hosted by locally silicified andesitic lavas (?). Mining has been conducted in this zone with an excavator and the small pit measures 30 m long by about 10 m wide. One surface grab sample was collected from this excavation and contained 4.09% Cu and 66 ppm Ag.

Section 10.0. Drilling

Aside from reported core drilling (Moura, 2018) on the Rio 27 concession held by Ventana Minerals, the Vendor nor the Issuer have conducted any drilling within the Illapel Copper project. The reported drilling was conducted by ENAMI who provides an array of services in support of the ‘small miner’ in Chile. The work was conducted under a special contract with Ventana but neither the location of the core nor the hole collars is known. It is not certain if the core logs or assay certificates can be found but it was reported that copper mineralization was encountered in areas that have already been exploited.

Section 11.0 Sample Preparation, Analyses, and Security

There are no records of compliant data collected within the Illapel project area nor has the Author received any records supporting sampling, or corresponding analyses.

Section 12.0. Data Verification

The Author visited the Illapel project from February 20 – 23, 2024 and was accompanied by Ventana Minerals co-founder, Director and CEO Jose Manuel Mendez. All of the goals assigned to this visit were accomplished including:

1. Visit the active Rio 27 mines to better understand the deposit's geology including host rocks, mineralized material, mineralogy and mineral styles, deposit geometry and structural controls.
2. Observe the Rio 27 deposit at surface levels to better understand surface expressions of copper mineralization prior to examining exploration targets.
3. Collect a variety of copper mineralized samples for analyses and comparison to samples from exploration target areas (Figure 12.1).
4. Visit as many of the target areas as time permits for purposes of sampling, photographing and note compilation.
5. Observe and document the project's infrastructure to assure it can or cannot accommodate activities proposed in Section 16.0.

Aside from observations contained in the Santiago Metals project evaluation, there is essentially no exploration data upon which any decisions may be based. The activities proposed are intended to acquire this basic information. The completion of Items 1-5 above has served to verify the potential for mineral discovery at multiple areas within the project's limits. In light of the limited size of the Rio 27 mine's discovery outcrop, say 10m by 30m, and the 'blind' nature of the northern deposit (see Figure 14.2), several of the prospects observed within the project area could host equally important copper mineralization.

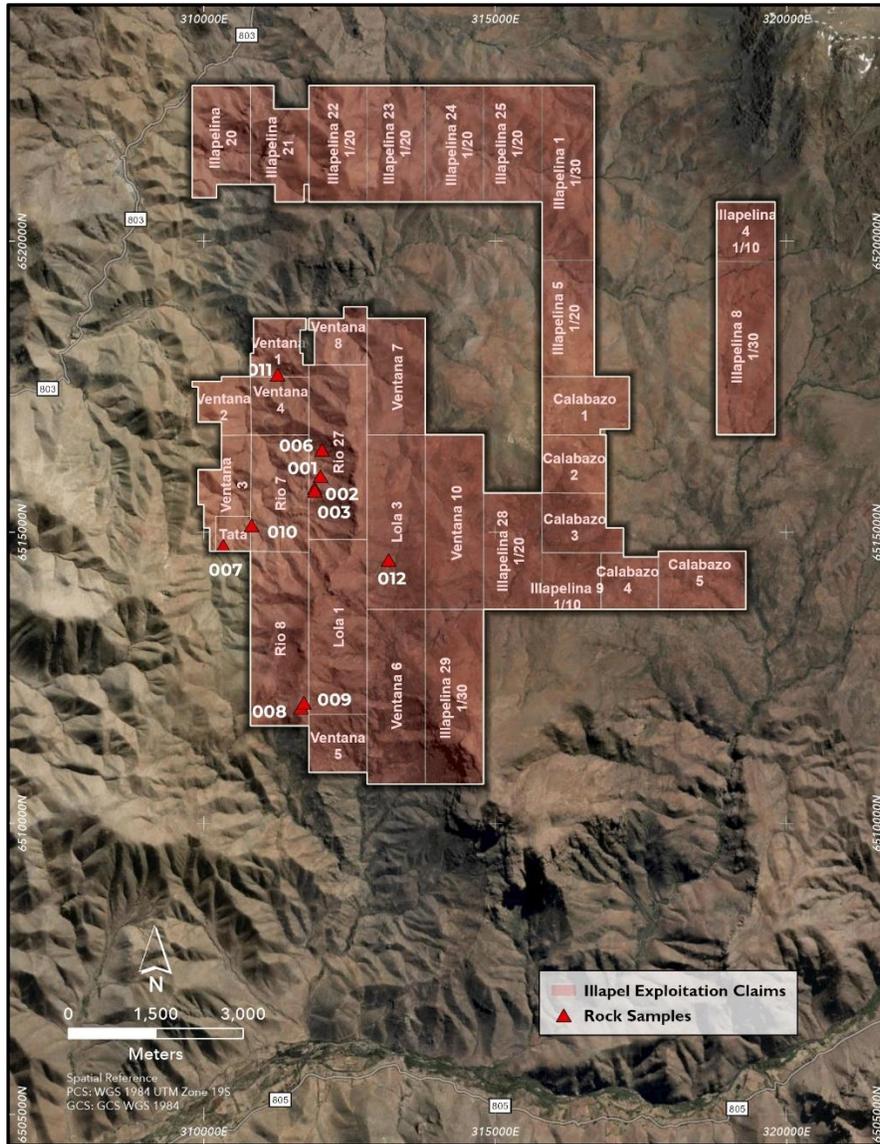


Figure 12.1 Illapel project land map showing the number and location of rock samples collected from February 20 to 23, 2024.

The Author’s visit to the Illapel project consisted of examinations of important geologic exposures at the Rio 27 mine as a prototype deposit for the targets sought during the proposed exploration. The copper deposit currently under development by SLM Rio 27 de Farellon Sanchez contains several of the important characteristics of the Chilean manto-type occurrence described in Section 8.0. The Rio 27 mine should play an important role in the development of the exploration model to be employed by Vortex Metals.

A total of 10 rock samples was collected from both mine exposures and prospects/outcrops across the property as shown in Figure 12.1. The location and description of these samples is provided in Table 13.1 and analytical results for selected elements are presented in Table 12.2.

All samples were collected, bagged and transported by the Author to Santa Barbara, CA where they were shipped via FedEx to ALS Chemex in Elko, NV for preparation and analysis. More specifically, the ME-ICP61a method was employed and included:

- Crushing and pulverization in Elko, Nevada;
- Sample digestion consisted of a four-acid digestion (nitric, hydrochloric, hydrofluoric and perchloric acids). Perchloric acid is added to assist oxidation of the sample and to reduce the possibility of mechanical loss of sample as the solution is evaporated to moist salts; and
- Elements are determined by inductively coupled plasma – atomic emission spectroscopy (ICP-AES).

Owing to the small size of this job, blanks and standards were not inserted, Instead, ALS has internal QA/QC methods on laboratory procedures.

Table 12.1. Sample locations and descriptions, February 21-23, 2024.

Sample No.	Area	Location			Sample Type	Sample Description
		N (UTM)	E (UTM)	Elevation (m)		
001	Rio 27 Mine/Portal Nuevo	6,515,963	312,000	1350	Chip	Abund 1mm chalc vnlt in poorly sorted SS
002	Rio 27 Mine/Bolson Sur	6,515,758	311,900	1381	Grab	Dense, brittle fn gn SS; w/ CuOx + chalc on fx
003	Rio 27 Mine/Bolson Sur/Level 4	6,515,710	311,903	1270	Chip	Pillar; dk gy SS? Abund diss chalcocite
005	Plant/Concentrates	ND	ND			Sulfide-rich sand
006	Rio 27 Trend/Nueva Esperanza	6,516,414	312,027	1277	Grab	Silic'd ss/ark; olive; N23-70W structures; CuOx on fxs
007	SW area/NW veins	6,514,766	310,332	1269	Chip	N20W sheeted vn; qtz vn w/ lat tex; CuOx + cpy in contact zones
008	SE Area/'La Neblina'	6,511,985	311,665	1564	Grab	And seds or flow; dk; w/ diss chalc + bor; str CuOx
009	SE Area/'La Neblina'	6,512,072	311,716	1550	Grab	Andesitic?; silic'd w/ chl; abund az + mal
010	SW area/NW veins	6,515,116	310,819	1238	Chip	Broad sheeted QV; gy qtz, fn-med gn; w/ cpy-chalc-bar
011	Mina Andacollo	6,517,705	311,265	995	Chip	SS; silic'd & vn'd w/ W-M CuOx; local gossan
012	East area	6,514,520	313,169	1494	Grab	Bx'd dk and flow bx cmt'd w/ qtz-CuOx

Table 12.2. Analytical results for samples collected across the Illapel project, February 21-23, 2024.

Sample No.	Area	Sample Description	Analyses		
			Cu (ppm)	Au (ppm)	Ag (ppm)
001	Rio 27 Mine/Portal Nuevo	Abund 1mm chalc vnlt in poorly sorted SS	6.54	0.007	35
002	Rio 27 Mine/Bolson Sur	Dense, brittle fn gn SS; w/ CuOx + chalc on fx	1.83	<0.005	5
003	Rio 27 Mine/Bolson Sur/Level 4	Pillar; dk gy SS? Abund diss chalcocite	2.29	<0.005	13
005	Plant/Concentrates	Sulfide-rich sand	35.2	>10.0	151
006	Rio 27 Trend/Nueva Esperanza	Silic'd ss/ark; olive; N23-70W structures; CuOx on fxs	5.32	0.017	44
007	SW area/NW veins	N20W sheeted vn; qtz vn w/ lat tex; CuOx + cpy in contact zones	0.4	0.105	1
008	SE Area/'La Neblina'	And seds or flow; dk; w/ diss chalc + bor; str CuOx	3.75	0.033	4
009	SE Area/'La Neblina'	Andesitic?; silic'd w/ chl; abund az + mal	4.7	0.016	58
010	SW area/NW veins	Broad sheeted QV; gy qtz, fn-med gn; w/ cpy-chalc-bar	3.5	0.295	1
011	Mina Andacollo	SS; silic'd & vn'd w/ W-M CuOx; local gossan	0.5	0.005	5
012	East area	Bx'd dk and flow bx cmt'd w/ qtz-CuOx	4.09	0.009	66

Section 13.0 Mineral Processing and Metallurgical Testing

There has not been any metallurgical testing on mineralized rock from the Property. SML Rio 27, owned by Ventana Minerals Group, is currently operating a mill and processing up to 3,000 tonnes per month of material from the Rio 27 mine. The facility consists of a 2-stage crushing system, ball mill and several small flotation cells; the concentrate is sold to ENAMI. Metal recovery is difficult to estimate since there is no grade controls on material sent to the plant, i.e. mill feed. The lack of critical sampling and data reflect the normal practices of ‘small miners’ locally and throughout Chile.

Section 14.0 Mineral Resource Estimates

There have not been any mineral resource estimates conducted within the Illapel project area.

Section 15.0 Adjacent Properties

SLM Rio 27, part of the Ventana Minerals Group, owns and operates the Rio 27 mine, located in Figure 9.1, and has developed about 600 meters of strike along the Rio 27 structure to a depth up to 125 metres. During the Author’s visit, the mine’s owner provided tours of various sites in the mine and access to limited maps and data relevant to the mine’s development. This information has never been publicly disclosed nor have the mine surveys been confirmed.

Despite indications, there is not enough information in-hand to confirm that copper mineralization from the Rio 27 mine will extend beyond SML Rio 27’s concession and into the subject project area nor is it indicative of copper mineralization observed throughout the property. The Author can confirm that all 3 samples from the Rio 27 mine contained copper values that exceed the calculated copper grade delivered to the mill or 1.39%.

Mineralization along this zone is contained within near vertical structures within fractured sedimentary and volcanic rocks ranging from a couple to several meters wide (Figure 15.1). Development has been along the Rio 27 structure and has encountered two areas where copper mineralization has blossomed at the intersection of transverse structures, including dikes and faults, up to several tens of meters. Both the Rio 27 and transverse structures are steeply dipping and the rake of the corresponding shoot or ‘bolson’ is near vertical. The southern shoot crops out whereas the northern shoot terminates upwards within the Rio 27 structure and is considered ‘blind’ (Figure 15.2).



Figure 15.1. Looking north along the Rio 27 structure from the 2nd Level. Development here was entirely in >2.0% Cu (per. comm. Jose Manuel Mendez) over a 4 to 5 metre width; back height is about 7 meters.

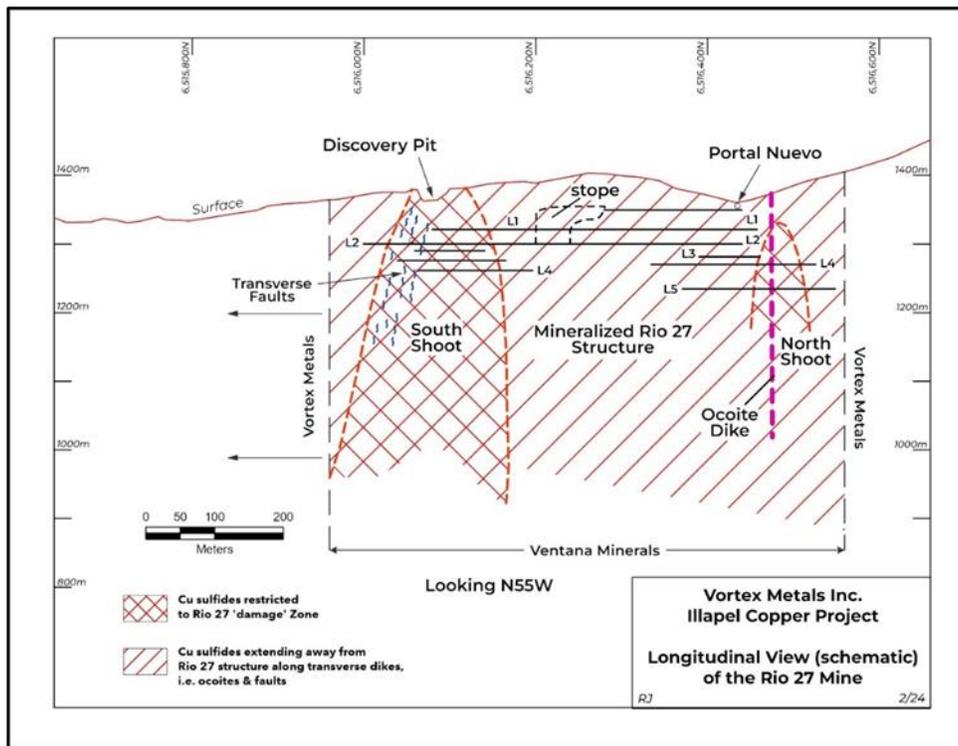


Figure 15.2. Generalized longitudinal view of the Rio 27 mine along the Rio 27 structure within the Ventana Minerals/Vortex Metals property boundaries. The north and south ore shoots are denoted by cross stipple (red) where the Rio 27 structure is intersected by faults and ocoite dikes.

The mine is accessed by at least 3 adits which enter the deposit from the west side. Up to 5 levels have been developed on both the north and south ore shoots at about 25-metre levels. Levels are linked by ramps; mine openings are generally 4m high by 5m wide but typically much higher when driven along the Rio 27 structure. In the ‘ore shoots’, a modified room and pillar technique is employed but the absence of drill holes and mine sampling leads to a somewhat chaotic stope configuration. There is strong evidence that the Rio 27 structure continues to the northeast and southwest onto Vortex’s ground (Figure 14.3); there has not been any definition of the lower limit of either the ore shoots or the Rio 27 structure. Both ‘ore shoots’ occur in close proximity to transverse faults and ocoite dikes (Figure 15.2).

The absence of geologic maps and corresponding assays did not allow the Author to distinguish copper grades in the mineralized portions of the mine. Copper mineralization is widespread and consists of 1mm-scale veinlets of chalcocite > bornite and disseminations in a variably altered rock composed of clastic sedimentary and volcanic rocks. During the Author’s visit, 3 rock samples were collected from within the mine works (001, 002 and 003) and results are given in Table 12.1. All samples were collected from portions of known deposits and contained visible copper mineralization, i.e. copper carbonates or chalcocite, and contained between 1.83% and 6.54% Cu and up to 35 ppm Ag. Regardless, these observations and results are not necessarily indicative of the mineralization on the property that is the subject of this technical report.

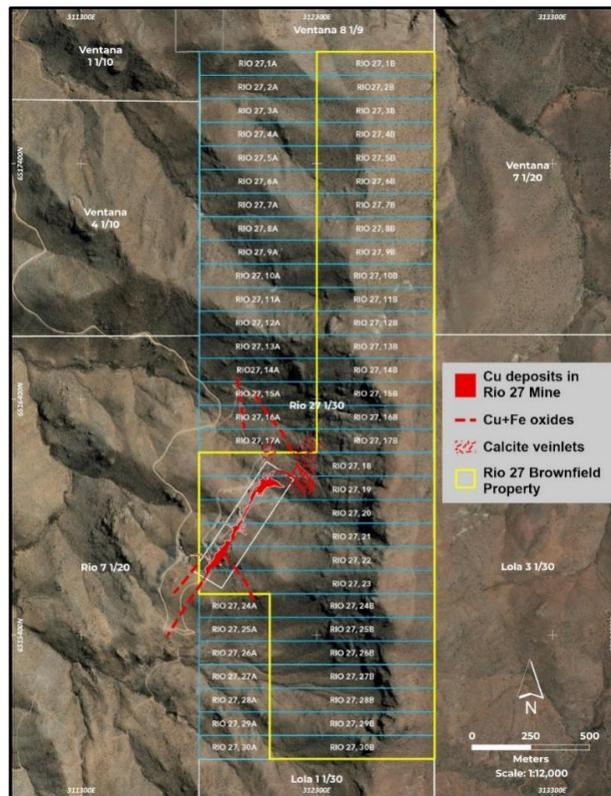


Figure 15.3. View of the Rio 27 Brownfield Project defining project area (yellow line) and approximate projection of mineralization in mine and surface exposures.

Section 16.0 Other Relevant Data and Information

SLM Rio 27 owns, and will continue to own, a significant part of the Rio 27 concession (Figure 4.1) which encompasses their current mining operation. Said ownership will also continue to extend to the ‘plant’ or metallurgical facility located in the outskirts of Illapel. The potential acquisition of this asset is described in Section 4.6. As shown in Figure 15.3, copper mineralization identified and exploited in the mine is part of a larger structure, referred to as the Rio 27 fault which continues to the NE and SW and into the ground of the Illapel project. Hence, it is possible that copper mineralization may extend beyond the limits of the ‘Brownfield Project’ and into ground optioned by Vortex Metals.

SLM Rio 27 is producing up to 3,000 tonnes per month from the Rio 27 mine from 3 adits accessing 5 levels developed on the Rio 27 mineralized structure which links two chimney-type deposits. Mining is currently at about 125 meters below surface exposures and the potential depth of the mineralized zone is not known. The copper mineralization defined along the Rio 27 structure in the mine workings likely extends to the northeast and southwest onto the concessions subject to Window/Ventana Minerals – Vortex Metals agreement.

Section 17.0 Interpretation and Conclusions

The Illapel project, shown in Figure 7.2, surrounds the currently active Rio 27 mine and shares a geologic environment known to host ‘Chilean Manto-type’ Cu-Ag deposits as described above. Following from:

1. Review of the geologic, mineralogic and genetic models for ‘Chilean Manto-type’ deposits which are widespread along the Coastal Cordillera of Central and Northern Chile (north of Santiago, <34°S) including the world-class El Soldado copper deposit (Figure 8.1);
2. Review of the El Soldado copper mine’s geologic and genetic model confirms many of the visual similarities and suggests a similar geologic setting and origin for the Illapel copper-silver deposits;
3. Review of data collected over the Illapel project, and the Rio 27 mine, since Windows Minerals initiation of activities in the area with emphasis on data from Santiago Metals project review; and
4. A site visit by the Author from Feb. 20-23, 2024 provided for a clearer understanding of the Rio 27 mine’s geology and copper deposits along with the distribution copper and gold occurrences throughout the project area.

It is concluded that the several copper-bearing prospects partially documented, and briefly visited, could reflect concealed copper mineralization forming deposit(s) referred to as ‘Chilean Manto-type’. Observed copper values, host rocks, structural controls, and alteration within the Illapel project support this interpretation. There is no certainty that apparent economic copper mineralization within the confines of the Rio 27 mine area (“Adjacent Property”) will extend into the ground outside of the Brownfield Project area, however, throughout the Illapel project, the

copper mineralization observed and sampled, and the hosting geologic environments, provide excellent exploration targets deserving of the activities proposed in Section 18.0.

Despite insufficient geologic and geochemical data from the mine and project area, consideration of Items #1 thru 4 above supports an aggressive exploration program which should commence around the deposits of the Rio 27 mine and advance outwards. Mapping around the mine by Santiago Metals reveals several immediate targets which require minimal additional definition. Windows Minerals, the Optionor, has constructed a network of roads and potential drill sites that can be immediately utilized in any future drilling.

Review of the 'Chilean Manto-type' Cu-Ag deposits model and world class example at the nearby El Soldado deposit reveals important similarities and supports exploration at the Illapel Cu-Ag project. Access to the 'Adjacent Property', Rio 27 mine, will permit the collection of additional data and the construction of an exploration model for extrapolation into the surrounding surface copper occurrences.

Additionally, a distinct class of deposits, intermediate sulfidation copper-gold veins, are present in the westernmost part of the project and likely form part of the larger Farellones Sanchez district to the west of the subject property. These copper-rich quartz-calcite-barite-sulfide veins, exposed over several hundred metres of strike, need to be carefully documented and drilled tested. Within the neighboring district, artisanal mining of these veins is occurring, at a minimum, over a few hundred metres vertically which provides a broad vertical range for exploration.

The brief review of Chilean mining law reveals a strong support for mineral exploration and mining at a national level. This is consistent with the long-term impact copper mining has had on Chile's economy. Mineral exploration, as defined in the proposed Phase 1 and Phase 2 below, is currently permitted and includes up to 40 drill pads, well beyond the scope of the activities recommended below. In the core area of the Illapel project, there are, at least, two access routes in the event of a dispute. Again, the mining law clearly protects the concession owner's right to access. Finally, the Illapel project is adjacent to active mining districts and is situated upstream from these disturbed areas. Being a copper project, it is unlikely that the proposed activities (Table 16.1), along with the likely future activities, would attract undue pressure or restriction beyond reason.

Section 18.0 Recommendations

From the initiation of mining activities by Ventana Minerals in 2009 at their Rio 27 project (mine), only minimal geologic and geochemical work has been conducted. In essence, sampling of their orebody has been done at their mill with grade determined by tonnage input and pounds of copper recovered in the concentrates. Data from exploration activities conducted by Santiago Metals in 2015 was only partially delivered to Ventana Minerals and original files are not available. Following from the data review summarized above, along with the site visit conducted from February 20-23, further exploration at the Illapel project should include the following activities:

- Careful analysis of the copper mineralization in and adjacent to the deposits of the Rio 27 mine. Emphasis should be placed on the deposit's host rocks, stratigraphic position and structural controls which are characteristics that are likely to translate to prospects throughout the project area.
- Detailed geologic mapping and geochemical sampling along the SW and NE projections of the Rio 27 mineralized corridor.
- Detailed mapping and sampling of the several mineralized sites (to be determined) throughout the project area.
- Regional mapping of lithologies and major structural features throughout the project area, with select sampling, to generate better geologic context for the target areas.
- Testing of the physical properties of rocks from, and adjacent to, the Rio 27 mine for magnetic susceptibility and chargeability to determine the suitability of airborne and ground geophysical programs.
- Multi-Spectral survey (desktop analysis) over a rectangle encompassing the project area (say 20 x 15km) to identify any mineralogical variations in surface rocks potentially attributable to mineralizing processes, i.e. sericite, calcite, chlorite and iron oxides.

A small field program (Phase 1) is proposed to better characterize the mineralized areas and define drill targets for potential drilling in a subsequent Phase 2. Considering the paucity of samples and absence of a geologic database or map, Phase 1 studies should focus on this critical void. The goals of Phase 1, considering the Exploration Model presented in Section 8.0, will be to define features considered important such as structures, volcanic stratigraphy, crosscutting intrusive rocks, distribution of copper mineralization and associated alteration. The proposed budget for Phase 1 is US\$107,000 and certainly less than US\$125,000.

The work, described in Table 18.1, will lead to a decision point on whether Phase 2 is warranted. This phase will focus on core drilling along the Rio 27 trend both NE and SW of the mine and in other prospects deemed sufficiently prospective. The Author recommends up to 2,000 metres of core drilling and a budget of approximately US\$1 million.

Table 18.1 Proposed activities and budget for Phase 1, Illapel Copper Project.

Activity	Number	Personnel	Cost/Unit	Total Cost
Multi-Spectral Analysis	ND	Contractor	\$15,000	\$15,000
Mapping - Expat	10 days	Contractor	\$1,000/day	\$10,000
Mapping – Chilean team (2)	30 days	Contractor	\$750/day	\$22,500
Analytical	250 samples	ALS (Chile)	\$60/sample	\$15,000
Field Vehicles/Gas	40 days	Rental (2)	\$200/day	\$8,000
Meals & Accommodations	50 days	Illapel	\$150/day	\$7,500
Travel	2 trips	US-Santiago	\$1,500/trip	\$3,000
Map Preparation/GIS	100	Santiago	\$60/hour	\$6,000

Rock Tests (map & charge.)	25 samples	Santiago	\$200/sample	\$5,000
Analysis/Reporting				\$5,000
Misc.				\$10,000
Total				\$107,000

Section 19.0 References

Aguirre, L. and Egert, E., 1965, Cuadrángulo Quebrada Marquesa, Provincia de Coquimbo: Instituto de Investigaciones Geológicas, Carta Geológica de Chile, No. 15, 92 p.

Arancibia, G., 2004, Mid-cretaceous crustal shortening: evidence from a regional-scale ductile shear zone in the Costal Range of central Chile (32 degrees S): *Journal South American Earth Sciences*, v.17, p. 209-226.

Araya, Marcelo, 2009, Informe Visita Prospecto Chillan: internal memo – Grupo Minero Las Cenizas, 16 p.

Boric, R., Holmgren, C., Wilson, N.S.F. & Zentilli, M., 2002, The Geology of the El Soldado Manto Type Cu (Ag) Deposit, Central Chile; in *Porter, T.M. (Ed.), Hydrothermal Iron Oxide Copper-Gold & Related Deposits: A Global Perspective*, Volume 2; PGC Publishing, Adelaide, pp 185-20.

Brahm M., Alfredo, 2018, Rio 27 Mine: Non-compliant Technical Report; prepared for SCM Ventana Minerals (incomplete).

Gana, P. and Zentilli, M., 2000, Historia termal y exhumación de intrusivos de la Cordillera de la Costa de Chile Central. Congreso Geológico Chileno IX, Puerto Varas, Chile, v.2, p. 664-668.

Gonzalez, F. and Holmgren, C. 1993. Características mineralógicas de la zona de oxidacion y su implicancia en la recuperacion de sulfuros en el yacimiento El Soldado, *Congreso Internacional de Ingenieria de Minas*, III Region, Copiapo, Chile, Actas, pp. 270-279.

Klohn, E., Holmgren, C., and Ruge, H., 1990, El Soldado, a strata-bound copper deposit associated with alkaline volcanism in the central Chilean Coastal Range, in Fontboté, L., Amstutz, G.C., Cardozo, M., Cedillo, E., and Frutos, J., eds., *Strata-bound ore deposits in the Andes*: Berlin, Springer-Verlag, p. 435-448.

Kojima, Shoji, Trista -Aguilera, D. and Hayashi, K., 2008, Genetic Aspects of the Manto-type Copper Deposits Based on Geochemical Studies of North Chilean Deposits: *Resource Geology* Vol. 59, No. 1: 87 – 98. <https://doi.org/10.1111/j1751-3928.2008.00081>

Levi, B., and Aguirre, L., 1981, Ensilic spreading-subsidence in the Mesozoic and Palaeogene Andes of Central Chile: *Journal of the Geological Society of London*, v. 38, p. 75-81.

Lopez, G.P., Hitzman, M.W. & Nelson, E.P., 2014, Alteration patterns and structural controls of the El Espino IOCG mining district, Chile. *Mineralum Deposita*. V. 49, 235-259. <https://doi.org/10.1007/s00126-013-0485-0>

Maksaev, V. and Zentilli, M., 2002, Chilean Strata-bound Cu-(Ag) Deposits: An Overview: in Porter, T.M. (Ed.), *Hydrothermal Iron Oxide Copper-Gold & Related Deposits: A Global Perspective*, Volume 2, 185-205.

Morata, D. and Aguirre, L., 2003, Extensional lower cretaceous volcanism in the Coastal Range (29 degrees 20' - 30 degrees S), Chile: geochemistry-and petrogenesis: *Journal South American Earth Sciences*, v. 16, p. 459-476.

Mpodozis, C., and Ramos, V., 1989. The Andes of Chile and Argentina. In: Ericksen, G.E., Cañas, M.T., and Reinemund, J.A. (editors), *Geology of the Andes and its relation to hydrocarbon and mineral resources*, Circum-Pacific Council for Energy and Mineral Resources, *Earth Science Series*, V. 11, pp. 59-90.

Murillo, Fernando, 2015, Preliminary geologic report – River 27 Project (Cu-Ag), Fourth region of Coquimbo, Chile: in-house report for Ventana Minerals.

Orrego, G.P.L., 2012, The El Espino Iron-Oxide Copper Gold District, Coastal Cordillera of North-Central Chile: Colorado School of Mines PhD Dissertation, 150 p.

Parada, M.A., Féraud, G., Fuentes, F., Aguirre, L., Morata, D. and Larrondo, P., 2005, Ages and cooling history of the Early Cretaceous Caleu pluton: testimony of a switch from a rifted to a compressional continental margin in central Chile: *Journal of Geological Society London*, v.162, p. 273-287.

Rivano, S. and Sepulveda, H., 1991, Hoja Illapel, Region de Coquimbo, in Mpodozis C (ed) *Carta Geologica de Chile*, scale 1:250,000.

Ruge, H., 1985, Geología y mineralización del yacimiento de cobre El Soldado, V Region, Chile: *Actas IV Congreso Geologico Chileno*, Antofagasta, Chile, Departamento de Geología, Universidad Católica del Norte, p. 855–872.

Ruiz, J., Freyrier, C., McCandless, T., Chesley, J. and Munizaga, F., 1997. Re-Os-Isotope systematics of sulfides from base-metal porphyry and manto-type mineralization in Chile. *International Geology Review*, v. 39, p. 317-324.

Vasquez, H.L., 2020, Discovery of Ocositas (Ocoitas) in the Araucania, metallogenic implications: pre-investigation document, Catholic University of Temuco, 1p. (<https://facultadingenieria.uct.cl/2020/03/02/hallazgo-de-ocositas-en-la-araucania-implicancias-metalogenicas/>).

Vergara, M., Levi, B., Nyström, J.O. and Cancino, A., 1995, Jurassic and Early Cretaceous island arc volcanism, extension, and subsidence in the Coast Range of Central Chile. *Geological Society of America Bulletin*, V. 107, N°12, pp. 1427-1440.

Wilson, M., 1992, Magmatism and continental rifting during the opening of the South Atlantic Ocean: a consequence of Lower Cretaceous Superplume activity?, in Storey B, Alabaster T, Pankhurst R, eds., *Magmatism and the causes of continental break-up*. Geological Society Special Publication, v.68, p. 241-255.

Wilson, N.S.F., and Zentilli, M., 1999, The role of organic matter in the genesis of the El Soldado volcanic-hosted manto-type Cu deposit, Chile: *ECONOMIC GEOLOGY*, v. 94, p. 1115–1136.

Section 20.0 Signature Page and Qualified Person Certificate

Certificate of Qualified Person: Robert Johansing

I, Robert Johansing, as author of the Technical Report titled " The Illapel Copper-Silver Project, Coquimbo, Chile" (the "Technical Report") dated effective April 30, 2024 and prepared for Vortex Metals Corp. (the "Issuer") and do hereby certify that:

1. I am an independent consultant doing business as Johansing & Associates and having an address for business at 154 Romaine Drive, Santa Barbara, CA 93105.
2. I graduated with a Bachelor of Science (1976) degree in Geology from Fort Lewis College, Durango, Colorado and a Masters of Science (1982) degree in Economic Geology from Colorado State University, Fort Collins, Colorado.
3. I am a Qualified Professional Member (#01520QP) of the Mining and Metallurgical Society of America.
4. I have practiced my profession in excess of forty-five years.
5. I have read the definition of “qualified person” set out in National Instrument 43-101 (“NI 43-101”) and certify that by reason of my education and past relevant work experience, I fulfill with requirements to be a “qualified person” for the purposes of NI 43-101. This report is based on my personal review of information provided by the SCM Ventana Minerals (a Chilean corporation) and Vortex Metals Corp. (a Canadian corporation) and on discussions with persons having past experience with the Illapel Copper-Silver Project. My relevant experience for the purpose of this report is:

1975	Mine Geologist, Sunnyside Mine (Vein -Au, Ag, Cu, Pb, Zn), Silverton, Colorado.
1976-1978	Senior Mine Geologist, Sherman Mine (CRD, Ag), Leadville, Colorado.
1979-1982	Applied research and exploration, Leadville, Colorado.
1982	VMS exploration in Puebla, Mexico
1982-1986	Consulting Geologist, London Mine (veins; Au), Park Co., Colorado.
1987-1990	Consulting Geologist, Leadville, Colorado.
1990-1993	Applied research, Kennecott Exploration, veins & CRDs in Mexico & Colorado.
1993-2002	Explored and delineated the El Dorado district, El Salvador (Kinross El Salvador).
2002-2015	Exploration for epithermal Au-Ag deposits in Latin America, Johansing & Associates.
2015-2024	Identification and exploration of “mineral deposits” in the Southwest U.S.

6. I am responsible for the preparation of the technical report titled "The Illapel Copper-Silver Project, Coquimbo, Chile" and dated April 30, 2024 and take responsibility for all sections of the Technical Report.
7. I visited the property from February 20 to 23, 2024 with Jose Manuel Mendez, the Vendor's representative, and visited several critical exposures, including mineralized material, reviewed the project's history, mine, processing facilities, infrastructure and reviewed critical issues including permitting, mining law, and available services in Chile.
8. I had no prior involvement with the properties that are the subject of the Technical Report before February 20, 2024.
9. As of the date of this certificate, to the best of my knowledge, information and belief, the Technical Report contains all scientific and technical information that is required to be disclosed to make the Technical Report not misleading.
10. I currently hold 250,000 options to purchase shares in the capital of the Company, at an exercise price of \$0.20 per option.
11. I am independent of the Vendor (Ventana Minerals) and the Company (Vortex Metals Corp.) applying all of the tests in section 1.5 of National Instrument 43-101.
12. I have read National Instrument 43-101 and Form 43-101F1, and the Technical Report has been prepared in compliance with that instrument and form.
13. I, Robert J. Johansing, do hereby consent to the public filing of the technical report entitled "**The Illapel Copper-Silver Project, Coquimbo, Chile**" and dated April 30, 2024 (the "Technical Report") by Vortex Metals Corp. (the "Company") with the TSX Venture Exchange under its applicable policies and forms in connection with the Qualifying Transaction (as such term is defined Policy 2.4 – *Capital Pool Companies* of the TSX Venture Exchange) of the Issuer and I acknowledge that the Technical Report will become part of the Issuer's public record.

Dated this day of May 1_, 2024

"Robert J. Johansing"

Robert J. Johansing

BSc Geology, MSc Economic Geology, QP MMSA