Pre-Bidding Environmental and Social Review Summary
Radomiro Tomic Desalination Plant– Chile

Original language of the document: English

1. General Information and Overview of Scope of IDB Invest E&S Review

Corporación Nacional del Cobre de Chile ("Codelco") has invited a consortium (hereafter "The Consortium"), along with other local and international companies or consortiums, to bid for developing and operating a desalinated water supply project ("The Project") on a Build, Own, Operate, and Transfer ("BOOT") basis to support Codelco's mining operations in the Antofagasta region in northern Chile. The BOOT contract includes a 20-year project operation phase. It is expected that a Special Purpose Company ("SPC") will be constituted to carry out the Project (the "Developer").

The Project includes: i) a seawater desalination plant with a design capacity of 840 liters per second ("l/s"); ii) marine works comprising seawater intake and brine discharge systems and temporary construction structures (pier and access roads); iii) a water conveyance system composed by a 160 kilometer ("km") water pipeline, and four booster pump stations; and iv) a power supply system (65 km 220 kV and a 14.5 km 110 kV lines) that will provide energy to the desalination plant and the booster stations. The marine works, the water conveyance pipeline, and the power supply lines are rated for the Project build out capacity of 1,956 l/s, which will be reached once the expansion of the Project is complete (not included in this operation). Desalinized water will be pumped according to the demand in volumes that will vary between roughly 55,000 cubic meters per day (m^3/day) and 73,000 m^3/day to a storage reservoir in the Division Radomiro Tomic (DRT) mine, located at the end of the conveyance system.

The Project is part of a bigger endeavor known as "RT Sulfuros" that will consist of the exploitation of new phases of sulphide minerals from the DRT open mine and its processing through a new concentrator plant of 200 thousand tons per day ("ktpd") capacity, to obtain a mean and maximum estimated production of 756,000 tons per year (t/year) and 1,051,000 t/year of copper concentrate and 7,000 t/year and 11,900 t/year of molybdenum concentrate.

As of the date of publication of this Environmental and Social Review Summary ("ESRS"), Codelco has preliminarily fixed the bid closing date for year-end 2018. It is expected that the adjudication of the BOOT contract should occur in the first semester of 2019.

Given the early stage in the Project's execution (bidding not yet concluded, adjudication not finished and BOOT contract not signed) this pre-bidding Environmental and Social Due Diligence ("ESDD")

performed by IDB Invest relied on the reports provided by a technical and environmental advisor,[1] and the review of the Project's available environmental and social documents which, among others, include: i) the RT Sulfuros Environmental Impact Assessment ("EIA"); ii) the Declaration of Environmental Impact ("DIA")[2] for the Project; and iii) the two Resolutions of Environmental Qualification ("RCA")[3], granted to the Project by the Chilean environmental authorities (one for the EIA and one for the DIA). An in-depth ESDD will be performed once the bidding process has ended, the contract signed, and the decision to pursue with IDB Invest's financial support made.

The Environmental and Social Action Plan ("ESAP") that is presented at the end of this document, contains a list of items that must be either prepared, presented, approved or executed to assure compliance with IDB Invest's Environmental and Social Sustainability Policy,[4] which comprises the Inter-American Development Bank Group's environmental and social policies[5] and the International Finance Corporation ("IFC") Performance Standards ("PS").[6]

Once the BOOT contract is signed and the winning consortium has requested IDB Invest a financial support, a post-bidding ESDD will be performed and a more detailed ESAP will be produced as a prerequisite for the operation's financial closing.

2. Environmental and Social Categorization and Rationale

The Project has been classified as a Category A (High-Risk) operation according with IDB Invest´s Environmental and Social Sustainability Policy, since it will likely generate, among other, the following impacts: i) increase of the concentration of combustion gases and particulate matter in the air; ii) increase of sound level pressure and vibrations; iii) loss of soil, alteration of groundwater quality, possible loss of flora individuals in conservation category, and impact in fauna habitat; iv) potential modifications of benthic communities, of the physical and chemical characteristics of seawater, and of the planktonic communities in the ocean; v) alteration of traffic flows and road safety interference; vi) possible changes in demographic structure of the nearby communities; vii) possible alteration of archaeological sites and national monuments; viii) modifications to the visual quality of the landscape; ix) generation of electromagnetic fields and x) alteration of the hydrological regime in the recipient watershed. These impacts are deemed to be of medium-high to high importance.

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1 An independent consultant has been hired to perform a preliminary ESDD following the requirements of the International Finance Corporation (IFC) Performance Standards (PS) and the Principles of the Equator (PE). The firm included site visits to the places where the desalination plant, the pipeline, the booster stations, the transmission lines are going to be built, as well as to the water storage reservoir in DRT mine.

2 Declaración de Impacto Ambiental.

3 The Resolución de Calificación Ambiental is, in fact, the environmental licence.

4 http://www.iic.org/environmental-and-social-sustainability-policy.pdf

5 Environmental Safeguards Compliance Policy (OP-703); Disaster Risk Management Policy (OP-704); Involuntary Resettlement Policy (OP-710); Gender Equality in Development Policy (OP 761); and Indigenous Peoples Policy (OP-765). See https://www.iadb.org/en/mici/operational-policies

6 https://www.ifc.org/wps/wcm/connect/Topics_Ext_Content/IFC_External_Corporate_Site/Sustainability-At-IFC/Policies-Standards/Performance-Standards

The Performance Standards triggered by this operation are the following:

PS 1: Assessment and Management of Environmental and Social Risks and Impacts
PS 2: Labor and Working Conditions
PS 3: Resource Efficiency and Pollution Prevention
PS 4: Community Health, Safety, and Security
PS 6: Biodiversity Conservation and Sustainable Management of Living Natural Resources
PS 8: Cultural Heritage

3. Environmental and Social Context

The Project will be located in the Antofagasta region in northern Chile, in the South-Central part of the Atacama Desert, the driest desert in the world. The region is devoid of vegetation except close to the Loa River. Much of the pipeline and powerline routes are covered by tephra.[7] The coastal site of the project shows prominent cliffs of the Cordillera de la Costa, a plateau that in less than 3 km rises from sea level to almost 1,300 m of altitude.

Twenty-eight species of birds (15 close to the treatment plant) have been identified in the proposed Project site from which five are protected at the national level, and two, the Guanay Cormorant (*Phalacrocorax bougainvilliorum*) and the Red-legged Shag (*Phalacrocorax gaimardi*) are categorized as nearly threatened by the International Union for the Conservation of Nature (IUCN). Nine species of mammals were also registered from which the Andean fox (*Lycalopex culpaeus*) and the guanaco (*Lama guanicoe*) are protected nationally. In addition, five species of reptiles were identified (all of them protected nationally) from which one, the Paulina's Tree Iguana (*Liolaemus paulinae*), is listed as critically endangered at the national level.

The location chosen by Codelco for the marine works, the desalination plant, the first pumping station[8] (EB1), and the first section of pipeline is in an area known as Caleta Viuda, situated at approximately 15 km south of Tocopilla, along highway Route 1. This area has been declared as a Landscape Interest Protected Zone ("ZPIP"[9]) as per the Intercommunal Plan Regulator Coastal Region ("PRIBC"[10]). Hence, land use is regulated so that any intervention will not induce any significant change in the landscape[11].

The pipeline will be buried along its entire route except for the ingress and egress to the pumping station buildings and the terminal reservoir. A right of way of 50 m at each side of the pipeline axis has been eased for the Project.

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7 A fragmental material produced by a volcanic eruption. Volcanologists also refer to it as pyroclast unless hot enough to fuse together into pyroclastic rock or tuff.

8 All booster stations will be hereafter identified as EB and a number that corresponds to "Estación Booster". The number has been assigned from 1 to 4 starting from the desalination (sea level) plant to the East (mine in the Andes).

9 "Zona de Protección por Interés Paisajístico": These areas are characterized by natural landscape components capable of generating tourist attraction poles.

10 Plan Regulador Intercomunal del Borde Costero de la II Región.

11 Such as the following: i) minimum plot area; 50 hectares; ii) maximum building height; 1 floor; and iii) any major construction, subjected to the approval of the Regional Secretariat of the Housing and Urbanism Ministry (SEREMI) of the Antofagasta Region in consultation with other competent authorities.

The entire Project site, including the conveyance pipeline route, is in an area of high seismic activity. According to revised documentation, earthquakes with a magnitude of 9.0 and 8.0 in the Richter Scale and tsunamis with tidal waves between 8m and 25m have occurred[12] in the area. Therefore, all engineering designs and constructive measures have been conceived to assure that all Project components will be capable of resisting this condition.

The climate in the region is predominantly extremely arid, especially where most part of the conveyance system and power lines will be located, and milder near the coast, where the desalination plant, the marine works, and EB1 will be constructed. The average temperature varies between 11°C in July to 24°C in January. The mean rainfall in the inland part of the Project area is just 1 millimeter ("mm") per year and in the coast, near Tocopilla, is of 3.8 mm. However, unusual heavy rains do occur (even though rarely) in the coastal area, causing severe floods.

Most of the Project has adequate road access: the marine works, the desalination plant, and pumping station EB1 can be accessed via highway Route 1, an asphalt paved roadway that links the zone with Mejillones and Antofagasta (located 103 and 150 km south); approximately 53% of the water conveyance pipeline from the desalination plant to the terminal reservoir in DRT will be built following Route's 24 main axis and most of the power lines will be installed parallel to the pipeline route. However, the Project also includes the following difficult to access locations: i) 50 km of the pipeline, located at the eastern most section and close to DRT, will take a route across a rugged terrain with no existing access roads; ii) there is a steep sloping at the west face of the Cordillera de la Costa where the conveyance pipeline and 110 kV and 23 kV power transmission lines (KP 0+300 and KP 3+100) are to be installed; and iii) there is a steep section between EB4 and the DRT mine (KP 110+000 and KP 160+000).

The Project site lies at approximately 14 km south of the community of Tocopilla; 5 km to the north of Maria Elena; 26 km north of the city of Calama and 25 km west of Lasana and San Francisco de Chiu Chiu. Other communities in the nearby region are Sierra Gorda, located about 65 km south of the Project, and Mejillones, situated at roughly 100 km south of the desalination plant.

4. Environmental Risks and Impacts and Proposed Mitigation and Compensation Measures

4.1 Assessment and Management of Environmental and Social Risks

The Project, as described before, is a part of RT Sulfuros endeavor, one of Codelco's five so-called structural mining projects. Therefore, for the forthcoming analysis, the DRT mine is considered an associated facility.

The Project has two main environmental permits (RCA): i) the Exempt Resolution No 22, of January 20, 2016, issued by the Regional Environmental Assessment Commission of Antofagasta, after having approved the EIA for the project "RT Sulfuros" (RCA-EIA); and ii) the Exempt Resolution No 45, of March 6, 2018, issued by the same environmental authority (RCA-DIA) after having approved

[12] 1877, 1995, 2007 and 2017.

the specific amendments to previous RCA in from of a Declaration of Environmental Impact (DIA) to allow the construction of the desalinization plant.

The Project has also been granted several environmental sectoral permits (Permisos Ambientales Sectoriales or "PAS") linked to the main RCAs mentioned above, such as: discharge in national waters of hazardous substances; archeological excavations; new constructions in cultural significance areas; constructions of tailings deposits; maritime intervention, constructions of mineral waste rock; industrial or mining waste sites; facilities for sewage; facilities for general waste; industrial qualification; fishing for research purposes; favorable construction report; hunting or capture; major hydraulic works; and watercourse change, among others.

The Maritime Concession, which ends in December 31, 2025 and is needed for the construction of the works related to the Project, was granted to Codelco in 2015 and will be transferred to the Developer. Any future necessary renewals will need to be obtained by the latter.

Even though the Project will be commissioned to the Developer, according to the Chilean law, Codelco will remain the project holder (and will be accountable for) in everything related with environmental and social compliance.

4.1.a E&S Assessment and Management System

The Consortium has not prepared yet a Project-specific ESMS. However, it has a corporate level management manual that refers to ISO 14001[13] as the standard for environmental management.

4.1.b Policy

A Project-specific E&S policy has not yet been prepared. One of the Consortium members has a corporate-level integrated management policy (Política de Gestión Integrada) dated August 2017 which comprises ISO 9001,[14] OSHA 16001,[15] and ISO 14001 and will be followed by the Consortium. The policy also states that it will be communicated to all Consortium employees and that national requirements need to be complied with.

4.1.c Identification of Risks and Impacts

Direct and indirect Project impacts have been assessed via the EIA for the "RT Sulfuros" mining project and the DIA prepared specifically for the Project (hereafter "the environmental assessments" or "EAs"). In general terms, the most significant include, among others, the following: i) increase of the concentration of combustion gases (NO_2, SO_2 and CO_x) and particulate matter

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[13] ISO 14001 is a series of environmental management standards developed and published by the International Organization for Standardization (ISO) that provides a guideline or framework for organizations that need to systematize and improve their environmental management efforts.

[14] ISO 9001 is the international standard developed and published by the International Organization for Standardization (ISO) that specifies requirements for a quality management system (QMS).

[15] The Occupational Health and Safety Assessment Series, (OHSAS 18001) is an internationally applied British Standard for occupational health and safety management systems.

(MP_{10}, $MP_{2,5}$ and MPS) especially during the construction phase due to the use of equipment and machinery; ii) increase of sound level pressure and vibrations due to the use of heavy machinery and blasting during the construction phase and thereafter, due to the operation of the desalination plant and the booster stations; iii) loss of soil, alteration of groundwater quality, possible loss of flora individuals in conservation category, and impact in fauna habitat[16], due to soil and vegetation removal to lodge the Project's components, especially the water conveyance system and the transmission lines; iv) modifications of benthic communities, of the physical and chemical characteristics of seawater, and of the planktonic communities as a consequence of the construction of Project's marine components and thereafter due to the discharge of brine; v) alteration of traffic flows and road safety interference, especially during construction; vi) possible change in demographic structure (level of income, demand for local workforce, etc.) due to the influx of about 2,600 workers in the construction peak; vii) possible reduction of income of a group of five people in Tocopilla village that live on the collection of marine algae species, and whose access to the shoreline during construction of the intake pipes will be restricted; viii) possible alteration of archaeological sites and national monuments, as a consequence of the soil and vegetation removal; ix) modifications to the visual quality of the landscape, especially due to the presence of the transmission lines; x) generation of electromagnetic fields linked to the presence of the transmission lines; and xi) increase of the possibility of bird collision with high tension lines, especially with the guard cables.

Besides the technical analysis of alternatives[17] that Codelco conducted as part of Project the pre-feasibility studies, the EAs do not include an alternative analysis but only a justification for the selection of the Project site and route (for the pipeline and pumps).

Regarding cumulative impacts, the effects produced by previous developments (past projects) in the area have already been factored in the Project's EA. Also, there are no other endeavors currently in execution or in the brink of being so (on-going or "present" projects). However, the only potential new development to be executed near the Project's marine structures seems to be a desalination plant that will provide industrial water to El Abra[18] mine. This new project, expected to begin construction in 2021, has not yet been presented to the Environmental Assessment Services (Servicio de Evaluación Ambiental or "SEA") to obtain its environmental license and its status, as showed in the project's website,[19] is "currently in the process of preparation of its baseline, which consists in the detailed description of the area of influence, that will allow the Environmental Impact Assessment (EIA) evaluate the impacts that could be generated or presented on the environmental components."

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16 The EA highlight the following impacts to the Guanay Cormorant (*Phalacrocorax bougainvilliorum*), the Red-legged Shag (*Phalacrocorax gaimardi*), the Andean fox (*Lycalopex culpaeus*), the guanaco (*Lama guanicoe*) and the Paulina's Tree Iguana (*Liolaemus paulinae*).

17 Aspects such as topography, population density, environmental aspects, distance to the sea and to existing infrastructure, roads, right of way (RoW), and compatibility with land use classification where used in selecting the proposed alternative.

18 The general layout of this new development is very similar to the Project's. It contains a desalination facility and a conveyance system to bring industrial water from the seashore to the mountains where the mis is located. However, its capacity and more detailed characteristics are still unknown.

19 See http://www.elabra.cl/el-abra/proyecto-concentradora/

Since the EAs do not include a cumulative impacts assessment, this analysis, that will evaluate the combined aggregated impacts of the Project and the above-mentioned desalination plant, will be required as a condition precedent to the Project's financial closure.

4.1.d Management Programs

The EAs include an environmental and social management plan ("ESMP"), which spells out mitigation and compensation measures for the impacts identified both for the mine and the Project. However, it does not address cumulative impacts.

For the construction phase, the ESMP contains measures to avoid, mitigate or compensate effects on air quality, habitat alteration, impacts to reptiles, and salvage and protection of archeological resources. It also includes measures to manage impacts on the landscape, and a series of voluntary measures adopted by Codelco such as the construction of temporary worker camps, improvements to community spaces and infrastructure, and support for economic development of fishermen and algae harvesters in Tocopilla who will be temporarily impacted by the construction of the marine works.

The ESMP also contains monitoring programs for construction (air quality, noise, fauna, benthic communities, changes in income for impacted groups, and archeology), operation (air quality, noise, hydrogeology, water quality, plankton communities, protected populations, and archeology), and decommissioning (air quality and hydrogeology).

No Project Occupational Health and Safety Plan (OHSP) for the construction phase was yet been developed.

For the operation and maintenance (O&M) phase, the ESMP sets out roles and responsibilities and references a series of associated documents including the relevant environmental permits and the ISO 14001 standard. It includes a framework for managing compliance with relevant environmental norms and commitments under the RCA; a draft plan for personnel training; measures to avoid, mitigate, compensate and manage impacts on air quality, noise, solid waste, hazardous waste, hazardous materials; procedures for the management of permits and public queries, auditing of environmental and occupational health and safety (OHS) performance, emergency response and drills; and a procedure for non-conformances, preventative measures, and corrective actions. It also identifies some potential impacts to communities such as impacts to transportation infrastructure, traffic accidents, and unmet expectations about job creation.

The OHSP for the O&M phase references a series of applicable norms and procedures including ISO 14001, OHSAS 18001, Chilean norms for workplace health and safety, and internal company policies and procedures. Programs for risk identification, contractor implementation of OHS requirements, meetings, and promotion of OHS culture, provision of personal protection equipment (PPE), health exams, medical attention, and incident reporting and non-conformances, among others, are also included. Furthermore, it includes target metrics for accident rates, training, and other OHS statistics. Measures for potential risks to local communities and communication thereof are, however, not included.

4.1.e Organizational Capacity and Competency

The Consortium has provided preliminary organizational charts for the construction and operational phases. These charts show that social, environmental, permitting, and health and safety leads will be maintained at the corporate level throughout the life of the Project. No further information was available as to assess if the proposed organizational structure has the capacity and resources to manage adequately the E&S aspects of the Project.

4.1.f Emergency Preparedness and Response

The EAs include an Emergency Preparedness and Response Plan ("EPRP") for the Project. Additionally, the Consortium has a draft risk management plan for operations, which sets directives on how emergencies should be managed, determines how Project personnel and community members should respond to various types of emergencies, and specifies how the Consortium should communicate emergencies to the media.

4.1.g Monitoring and Review

The EAs include a monitoring program to verify the implementation of E&S and OHS plans and procedures for construction, operation, and closure phases. Key E&S aspects to be monitored include air quality, fauna, archaeology, labor and community impacts, noise, hydrogeology, and marine environment. The Consortium will also have an auditing program to identify any opportunities for improvement.

According to the Chilean regulations, on top of the internal monitoring and review system that has to be put in place by the Developer, the Project will be monitored externally by the following instances: i) the Superintendence of the Environment (*Superintendencia del Medio Ambiente -SMA*); and ii) the sectoral offices with competence in environmental, sanitary, labor, natural resources and infrastructure areas such as: the Regional Ministerial Secretariat for Health (*Secretaría Regional Ministeristerial de Salud -SEREMI Salud*); the Council of National Monuments (*Consejo de Monumentos nacionales -CMN*); the Labor Inspection Entity (*Inspección del Trabajo*); the Regional Ministerial Secretariat for Transport (*Secretaría Regional Ministerial de Transporte -SEREMI Transporte*), the Regional Ministerial Secretariat for Mines (*Secretaría Regional Ministerial de Minería –SEREMI Minería)*, the Chilean Mining Commission (*Comisión Chilena del Cobre -COCHILCO*), the National Geology and Mining Service (*Servicio Nacional de Geología y Minería -SERNAGEOMIN*).

IDB Invest will monitor the Project's E&S aspects with the support of an Environmental and Social Independent Consultant.

4.1.h Stakeholder Engagement

Except for Tocopilla that is located at about 15 km north form the proposed desalination plant site and Maria Elena, situated at 5 km to the south of the conveyance system and roughly 60 km to the west of the seashore, there are no populated areas near the Project other than small camps that lodge workers from nearby mines. However, the EIA for RT Sulfuros identifies the following communities as being near to the mine: the city of Calama at roughly 26 km south of the DRT mine;

the indigenous communities of Lasana and the San Francisco de Chiu Chiu Atacameña situated at about 25 km to the west of the DRT mine and the compensation reservoir (Tranque Talabare); Sierra Gorda, located about 65 km south of the Project; and Mejillones, situated at roughly 100 km south of the desalination plant.

The EAs present a community participation plan that briefly describes previous engagement activities and includes the guiding principles, objectives and procedures for engaging stakeholders in the future. However, it must be enhanced to be considered a Stakeholder Engagement Plan (SEP) and comply with IFC PS1.

No stakeholder analysis nor stakeholder engagement plan (SEP) has been yet developed for the Project.

4.1.h.i Disclosure of Information

Consultation requirements in Chile are aligned with requirements contained in this PS. Per national obligations, public consultation[20] was undertaken during the EIA process for the RT Sulfuros project[21]. These activities, carried out between August 2012 and April 2013, consisted of meetings with members and leaders of social organizations and indigenous communities located the RT Sulfuros area of influence[22]. Each meeting began with a general presentation of the Project, highlighting the most relevant aspects to the case, so that then, through a participatory dialogue, the stakeholders could express their concerns and expectations.

During the RT Sulfuros public consultation process, 249 observations from 20 observants were received. They were mainly focused on impacts on different environmental and social components: effects over water quality in the sea due to the desalinization plant, potential impacts of the tailings deposit in the Talabre pond sector (for the mine) and impacts over archeological sites. All observations were answered and, when needed, new provisions were incorporated in the EIA.

A formal public consultation was not undertaken for the DIA even though the SEA received six requests from community members of Calama to require it. The reasons behind the SEA's decision was that: i) Pursuant to environmental regulations, a public participation process is not mandatory[23] when projects are environmentally assessed through a DIA; and ii) all major impacts were already identified and managed in the EIA for the RT Sulfuros project.

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20 "Consultation" in Chile es understood as "Prior Consultation" with indigenous communities. "Consultation" as spelled out and required by PS1 and Directive B6 of IDB's Environmental and Social Safeguards Policy (OP-703) is referred in Chile as "citizen participation",

21 See http://seia.sea.gob.cl/expediente/expedientesEvaluacion.php?modo=ficha&id_expediente=8210090#-1

22 Among others, the following can be mentioned: Indigenous communities of Chiu-Chiu and Lasana; Agriculture Association of Calama; Association of Fishermen and Algae Pickers of Tocopilla; and aggrupation Ayllus sin Fronteras;

23 The legislation also foresees that a public consultation process for a DIA can take place when; i) it is requested by 2 or more citizens organizations with legal personality or at least 10 natural persons; ii) the request has been submitted within 10 days counted from the date the DIA was published in the Official Gazette; and iii) the given project is likely to produce -pursuant environmental regulations- environmental burdens to nearby communities.

The Project EIA and the DIA have been available for public consultation in the SEA's web page[24] since the day they were presented for revision.

4.1.h.ii Informed Consultation and Participation

Even though the EAs do not assess the extent to which local communities and their culture or livelihoods may be affected by the Project, especially due to the migration of workers, the increase in traffic and the nuisance from construction activities, it is foreseeable the these impacts will be of low-to-medium magnitude and importance due to the fact that the two closest communities, Maria Elena and Tocopilla, are located at almost 5 km and 15 km from the Project.

A formal prior consultation process was undertaken with representatives from the Lasana and San Francisco de Chiu Chiu indigenous communities, deemed to be affected by the RT Sulfur mining project.

4.1.i External Communication, Grievance Mechanisms and Ongoing Reporting to Affected Communities

No community grievance mechanism nor ongoing reporting to affected communities have yet been developed for the Project.

4.2 Labor and Working Conditions

Construction labor in Chile is governed by the Code of Work, established in 1937 and enhanced throughout the succeeding years. Hence, Project's labor contracting strategy requires all contractors and subcontractors to comply with the Code of Work and to sign a contract with each worker.

The Consortium has not yet performed a formal study of the labor availability in Chile's Northern Region to support the Project; however, preliminary discussions with union representatives and local contractors, indicate the availability of workers.

Training of unskilled workers to transform them into qualified labor (equipment operators, electricians, welders, etc.) is the responsibility of the Labor Union. It is expected that additional training will be provided by the Project's EPC contractor and major subcontractors.

No human resources (HR) policy nor Project-specific code of work were available to be reviewed during the ESDD.

The Chilean legislation allows the existence of worker organizations and unions. It is expected that the awarded Consortium will undertake conversations with union representatives to structure a future relationship should the Project were awarded to it.

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[24] http://www.sea.gob.cl/

Chilean legal framework[25] has incorporated the principles of non-discrimination (race, gender, origin, religious orientation, etc.) and equal opportunity for all workers. It also, specifically prohibits the use of child and forced labor, and regulates the rights and duties of migrant workers, non-direct workers and workers engaged by third parties (contractors and subcontractors).

The number of workers during the construction peak has been established to be of about 2,600. Therefore, two workers' accommodation camps will be constructed for the Project: one, with a capacity to lodge 2,000 workers, will be located near the desalination plant[26]; and a second, with a capacity of 600 workers, to be constructed near the pipeline's progressive 100+000 km. Both camps will provide accommodation to all Project members including subcontractors. In addition, the personal working inside the mine area will be accommodated in Codelco existing facilities. Notwithstanding, the Consortium has not yet developed a formal worker accommodation plan nor a retrenchment plan.

So far, no workers (internal) grievance mechanism has yet been developed by the Consortium.

4.3 Resource Efficiency and Pollution Prevention

4.3.a Resource Efficiency

During its construction phase, the Project will use about 3.0 l/s (construction: 2.3 l/s; dust control: 0.7 l/s) of industrial water, and around 3.0 l/s of potable water for consumption. Industrial and potable water will be supplied by authorized providers.

During operation, the Project will require only about 0.05 l/s of potable water for consumption, which we will be provided by the desalination plant. For the operation of the plant, and to achieve the Project design flow (1,956 l/s), the amount of seawater used will be of approximately 4,686 l/s. Production of freshwater from seawater will not be continuous as the Project will have two reservoirs to regulate the flows that will delivered by the conveyance system to the DRT.

Since the Project will utilize seawater for operations, no water stress will be produced on third parties (e.g., local communities).

The EAs estimate that, during construction, the Project will consume approximately 500 cubic meters (m^3) per month of diesel that will be used to fuel-up 16 electric generators that will supply energy (3,840 kW), as wells as the vehicles and heavy equipment to be employed. During operation, the Project's consumption of diesel for the operation of vehicles will most likely drop to 2 m^3/month. It will also use 117 MW of electricity for the operation of the plant and the water conveyance system. Electricity will be supplied by two 110 kV substations. A 900 kW backup generator will be installed and used in emergencies.

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[25] Chile has ratified the following International Labor Organization (ILO) conventions: i) 29 on Forced Labor; ii) 87 on Freedom of Association and Protection of the Right to Organize; iii) 98 on the Right to Organize and Collective Bargaining; iv) 100 on Equal Remuneration; v) 105 on the Abolition of Forced Labor; vi) 111 on Discrimination (Employment and Occupation); vii) 138 on Minimum Age (of Employment); and viii) 182 on the Worst Forms of Child Labor.

[26] Beginning of pipeline (0+000 km)

The Consortium has not yet calculated the Project's annual greenhouse gases ("GHG") emissions.

4.3.b Pollution Prevention

4.3.b.i Noise, Vibration and Air Quality

The main sources of vibrations during the Project's construction phase will be the use of equipment and explosives. During operation, other than those associated with the operation of the desalination plant and of the booster stations, no major vibrations are expected to be induced.

Regarding noise, the main sources during construction include: traffic vehicles, use of construction tools, operation of heavy equipment, and use of explosives. During operation, noise sources will be those associated to the operation of the desalination plant and pumping stations of the water conveyance system.

As part of the EAs, daytime and nighttime noise baseline data was collected at 14 receptors (houses, substations, thermal plants) with distances to the project ranging from 120 m to 12 km. The levels registered ranged between 24 dB and 65 dB for daytime and between 25 dB to 62 dB for nighttime. The main noise sources identified include: wind, ocean waves, and vehicle traffic.

Noise modeling was conducted using the worst-case scenario (operation of all construction equipment) and the levels reached around 49 dB, in average. The analysis of these results showed that noise levels near the desalination plant could normally be near 42 dB, which is below the international standards limit even for nighttime.

During Project construction, the main release of particulates to the atmosphere will be dust and emissions from heavy equipment engines and electricity generators. The EAs estimate that the Project will yearly generate about 1,800 tons of NO_x; 130 tons of SO_x; 350 tons of CO_x; 256 tons of PM_{10}; 145 tons of $PM_{2.5}$; and 1,700 tons of PMs. During operation, the mains source of emissions will be the use of vehicles (trucks and heavy equipment). It is estimated that yearly the Project will emit about 8 tons of NO_x; 0.02 tons of SO_x; 1 ton of CO; 2 tons of PM_{10}; 0.7 tons of $PM_{2.5}$; and 12 tons of PMs.

The EAs conclude that neither during its construction nor its operation phase the Project will have a significant contribution in the concentration of SO_2, CO_2, NO_2, $PM_{2.5}$ and PM_{10} in nearby communities (Tocopilla and Maria Elena which are the closest). Nonetheless, it includes mitigation measures to control $PM_{2.5}$ and PM_{10}, and PMs for both phases such as dust control, the use of additives (bischofite[27]) for dust suppression, and constant maintenance of roads. The O&M ESMP contains other measures to minimize air emissions: maintenance of roads, implementation of speed limits, maintenance of equipment, and prohibiting open burning.

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[27] Bischofite (bischofit) is a hydrous magnesium chloride mineral with formula ($MgCl_2 \cdot 6H_2O$) often used to stabilize unpaved roads.

4.3.b.ii Effluents

The so called "industrial water" (water to be produced by the desalination plant) will be totally consumed by the DRT mine and no discharges will be released to any water body or creek. Desalinated water will be transported by the conveyance system from the desalination plant to a 250,00 m^3 reservoir (final point of the Project), located in the DRT mine, from which it will be conducted to the mine for its use. Residual water (mining waste), after having a primary treatment, will be carried to a second regulation reservoir (tranque Talabere) from which it will be either pumped to a third reservoir located near the first one (clean water) to be reused in the mining process or utilized for dust control in the mine.

During operation, the Project will mainly produce wastewater from restrooms and brine from the desalination process. Approximately 208 m^3 of wastewater will be generated daily by the sanitary facilities, which will be treated in a small wastewater treatment plant (WWTP) and thereafter used for dust control of roads and work sites. At full capacity, once the expansion of the desalination plant will be completed, the Project will discharge about 2,730 l/s of brine into the sea, outside of the coastal protected zone, after having verified its compliance with the maximum limits included in the Chilean Supreme Decree D.S. No. 90/00 MINISEGPRES that regulates the concentration of pollutants associated with the discharges of liquid waste to superficial marine and continental waters. Since Chile does not have national requirements to regulate the salinity concentration of brine released in the sea, the Project will use the standards contained in the Spanish Royal Decree 927/1988[28], which requires a maximum 10% variation of in salinity[29] at 40 m from any discharge.

For the worst-case scenario[30], brine salinity has been estimated in 69 Practical Salinity Units (psu[31]) at the discharge outlet, compared to 34.7 psu at the intake point. Water modeling included in the RT Sulfuros EIA[32] and complemented by several studies of sea tides and currents conclude that: i) the salinity of water would be of approximately 34.7 + 10% psu at 40 m from the discharge point; ii) water salinity at 40 m from the discharge will comply with the Spanish standards; and iii) the dilution capacity of the water bodies is not to be affected. A continuous monitoring of the seawater salinity will allow adjust the operation of the desalination plant to assure compliance with the Chilean and Spanish standards.

4.3.b.iii Sediments

The EAs conducted several inter-seasonal samplings of sediments and water in the marine environment near the proposed desalination plant to address issues such as the composition of the sediment and water toxicity, metal concentration, hydrocarbon presence, inorganic and organic compounds concentration, etc. Most of the results of sediment and water toxicity were within

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28 Royal Decree 927/1988, of 29 July, by which the regulation of the public administration of the water and of the hydrological planning, in development of the titles II and III of the Law of water is approved.

29 This variation is with respect to the average salinity of the sea water in the surroundings of the discharge.

30 That is when the two desalination plants are working at maximum capacity (intake of 4,686 l/s of seawater and production of 1,956 l/s desalinated water), and when low tides, low wave intensity, and lowest speed of ocean current happen at the same time.

31 In real terms, 1 psu = 1 gram of salt per liter of water.

32 Using the CORMIX model, which is a USEPA-supported mixing zone model and decision support system for environmental impact assessment of regulatory mixing zones resulting from continuous point source discharges.

acceptable levels. However, the concentration of some metals (i.e. hexavalent Chromium) were already higher than the limits established in the national norms, presumable due to the presence of previous mining activities in the zone.

Even though a small quantity of sediments coming from the lime mixing to be used in the proposed post-treatment process of the desalination plant might be discharged directly to the sea, their concentration is deemed by the EAs to be practically negligible.

4.3.b.iv Bioaccumulation

Although no correlation between the sediment and water samples and local biota was established as part of the EAs, the low contamination levels found in the samples indicate no need for bioaccumulation studies.

4.4 Community Health, Safety and Security

4.4.a Community Health and Safety

About 2,600 workers (to be accommodated in two camps[33]) will be employed during construction peak. Transportation services will be provided between the camps and the various Project sites. Even though the nearest population (Tocopilla) is located at about 15 km from the projected camp at the desalination plant, some potential low-to-medium negative impacts can be expected in surrounding communities due to increase in traffic, workers and security guards interacting with residents.

During its construction phase, the Project will utilize approximately of 7.9 tons/month of explosives which will be stored in a mobile facility (*polvorín movil*), following Chilean regulations[34]. For the operation of the plant, the Project will require over 15 tons/year of different chemicals[35] that will be brought to the Project site by authorized trucks. It will also utilize diesel for backup power generation and will have a 1.5 m^3 fuel tank on site.

The draft O&M ESMP states that a procedure for the management for hazardous materials will be prepared, compliant with decree DS 78/09 from the Ministry of Health[36] and the Codelco requirements[37].

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[33] One camp with the capacity to lodge 2,000 people will be installed near the desalination plant, and the other, located in the progressive PK100 will have a capacity to receive 600 workers.

[34] Transportation of these materials is normally done in clearly marked convoys escorted by vehicles provided by the Carabineros. Storage facilities need to meet minimal standards to assure the safety of the people who will handle them and of the communities.

[35] Sulfuric acid, sodium hypochlorite, ferric chloride, coagulants, CO_2, calcium hydroxide, citric acid, sodium bisulfite, caustic soda, and corrosion inhibitor

[36] Reglamento de Almacenamiento de Sustancias Peligrosas.

[37] Estándares de Control de Fatalidades.

4.4.b Security Personnel

There is yet no detailed information on security services for the Project. Notwithstanding, contracts with security firms will have to include provisions to regulate the use of force, define if the guards will be allowed or not to carry weapons and if they do, how and when to use them.

4.5 Land Acquisition and Involuntary Resettlement

The Project will not generate any physical or material economic displacement other than some temporary economic impacts on 5 algae harvesters[38] that perform this activity in the area where the future desalination plant is going to be built.

The approximately 530 hectares (ha) of land required by the Project[39] has already been eased or acquired by the RT Sulfuros mine. Part of it was obtained via a land lease agreement for the Project site that was acquired from the Government of Chile back on September, 2015.[40] The right of ways (RoW) for the conveyance system (50 m at each side of the pipeline main axis) and the transmission lines (20 m to 30 m at each side of their axis, depending on the line's tension) has been secured under the Chilean mining law.

4.6 Biodiversity Conservation and Natural Habitats

4.6.a General

Seasonal flora, fauna and marine baseline data was collected for the Project. In general, vegetation is practically inexistent where the desalination plant will be built. Plant formations identified along the water conveyance system area include: prairies, shrubs, and riparian shrubs. Eleven species of flora were identified along the pipeline, including one categorized as vulnerable at the national level.

The pipeline will run under the Loa river,[41] which presents high concentrations of total suspended solids, chlorides, sulfate, boron, and arsenic. Fish were not identified in this water body, however, the literature lists five species of fish in the watershed.

The EAs identified 28 species of birds, nine of mammals, five of reptiles and no amphibians along the Project site.

Studies related to the marine environment included seasonal (summer and winter) surveys. Macro benthos, phytoplankton, and zooplankton were evaluated.

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38 An agreement has been reached with these people to compensate their economic loss during the construction phase of the desalination plant. Thereafter, it is expected that no further impact will be generated on them.

39 For the desalination plant, the booster stations, the conveyance system and the transmission lines.

40 Such land purchase agreement is subject to a termination condition by which the property will revert to the Government of Chile if the works related to the Project are not finished within an undetermined number of months, presumably in line with the construction schedule.

41 In this point the pipeline will be constructed using horizontal directional drilling, a no-trenching method.

4.6.b Modified, Natural and Critical Habitat (CH)

Even though the Project is in a natural habitat with some anthropogenic use (tourism) and that the EAs identify four bird species categorized as protected by IUCN during autumn sampling and two identified as nearly threatened by Bird Life International in summer and winter, it will not intersect and critical habitat.

The Project is not located in any nationally or internationally recognized protected area. It does not intersect any Important Bird and Biodiversity Area (IBA), Alliance for Zero Extinction sites (AZE), or any other biodiversity, ecologically or biologically important area[42]. Notwithstanding, the EAs identify several protected areas near the Project (the closest one at more than 80 km away): the National Reserves Alto Loa, Los Flamencos, and La Chimba; the Valley of the Moon Nature Sanctuary; and the Ramsar sites Salar de Tara and Soncor Hidrological System.

The location chosen by Codelco for the marine works, the desalination plant, the pumping station EB1, and the first section of pipeline along Route 1 highway is considered a local protected area[43] as defined by the Intercommunal Plan Regulator Coastal Region II (PRIBC) and the Plains Coastal Scenic Interest area (ZPIP).

The Project will not introduce any alien species.

4.6.c Management of Ecosystem Services

The EAs do not include an ecosystem services assessment. However, they identify a group of five people in Tocopilla whose principal economic activity is the harvesting of marine algae. During construction (a period of 30 months), they will have restricted access to the shoreline, their ability to collect the algae for will be reduced and their economies will be impacted. The Project reached a compensation agreement with this group that includes support for their economic development.

4.7 Indigenous peoples

Indigenous peoples (IPs) are present in this region in Chile. Some of them have come into legal disputes over other industry and housing construction projects in the Atacama region. According the Global Platform of Indigenous Communities and Lands[44] there are no legally recognized indigenous territories in the Projects area of influence. Therefore, it will not have any material impact on any indigenous community, as the closest one to the Project sites is about 25 km apart. However, the indigenous communities of Lasana and San Grancisco de Chiu Chiu (which according to the EAs have already been affected by other mining projects in the region) are in the area of influence of the DRT mine and, hence, a formal consultation was undertaken with their representatives as per Chilean regulations.

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42 Conservation International Biodiversity hotspots: https://databasin.org/maps/new#datasets=23fb5da1586141109fa6f8d45de0a260

43 See footnotes No. 9 and 10.

44 http://www.landmarkmap.org/

Prior Consultation, Indigenous Consultation or simply "Consultation" as understood by the Chilean legislation when performing a consultation with indigenous communities, is a process lead by the Environmental Evaluation Service (Servicio de Evaluación Ambiental -SEA) that follows the procedures established in the International Labor Organization Indigenous and Tribal Peoples Convention (ILO 169).

Even though after two years of discussion the San Francisco de Chiu Chiu community withdrew from the consultation process undertaken for the DRT mine before reaching a formal settlement, other agreements[45] were reached with the Lasana community, the Asociacion Indigena de Agricultores y Regantes de Chiu Chiu and the Junta de Vecinos de la Unidad Vecinal N24 de Chiu Chiu, which imposed new measures or amended previously compromised measures established by CODELCO in the EIA.

4.8 Cultural Heritage

The Project is located less than 1 km apart from the site known as "Geoglifos de Chug Chug[46]" (Chug Chug Geoglyphics), a national monument that, unfortunately and due to the lack of formal protection, has been damaged by nearby mining activity, and foot and off-road-vehicle traffic, among other human activities. The Project will not impact this site but might intersect areas of significant cultural resources.[47] Therefore, a chance finding procedure will required as a condition prior to the financial closure of this operation.

The Project's archaeology and paleontology management plan (prepared in April 2018) includes a series of measures to prevent, mitigate or compensate any possible impact to these sites and briefly refers to a chance finds procedure. However, the Chilean Council of National Monuments, has not yet approved it.

In relation to critical cultural heritage, as of June 2018,[48] no sites included in the United Nations Educational, Scientific and Cultural Organization (UNESCO) World Heritage List are present in the Project area. Other than the Geoglifos de Chug Chug and a pre-Hispanic traffic stop (which will not be affected by the Project), no cultural sites have been identified near the Project site.

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45 See http://seia.sea.gob.cl/expediente/expedientesEvaluacion.php?modo=ficha&id_expediente=8210090#-1, items 30, 31, 32, 33, 34, and 35.

46 The area known as Chug-Chug encompasses 23 archaeological sites and preserves close to 500 geoglyphs depicting geometric and zoomorphic figures. They represent the highest concentration of geoglyphs in the Atacama Desert. See https://www.wmf.org/project/chug-chug-geoglyphs.

47 The Project's layout overlaps with 160 sites of some archaeological importance.

48 UNESCO World Heritage List - Interactive Map. (http://whc.unesco.org/en/interactive-map/).

5. Local Access of Project Documentation

The EIA[49] for the RT Sulfuros and DIA[50] for the Project have been available for consultation and suggestions in the SEA's website since, May 2003 and August 2017, respectively. Currently the EAs can also be accessed on the IDB Invest website.[51]

49 http://seia.sea.gob.cl/expediente/ficha/fichaPrincipal.php?modo=ficha&id_expediente=8210090

50 http://seia.sea.gob.cl/expediente/ficha/fichaPrincipal.php?modo=ficha&id_expediente=2132655856

51 https://idbinvest.org/en/projects/radomiro-tomic-desalination-plant

6. Pre-Bidding Environmental and Social Action Plan – ESAP

N°	Action	Deliverables	Proposed Deadline
1.0 Assessment and Management of Environmental and Social Risks and Impacts			
1.1	Present and adopt a project-specific ESMS	Resolution adopting the project-specific ESMS	Prior to financial closing
1.2	Present and adopt a project-specific E&S policy	Resolution adopting the project-specific E&S policy.	Prior to financial closing
1.3	Present a cumulative impact assessment that includes a mitigation plan.	Cumulative impact assessment	Prior to financial closing
1.4	Present an Occupational Health and Safety Plan for the construction phase.	Occupational Health and Safety Plan	Prior to financial closing
1.5	Provide an E&S organizational chart with details of the personnel assigned for each of the roles.	E&S organizational chart	Prior to financial closing
1.6	Prepare an Emergency Preparedness and Respond Plan (EPRP) for the construction phase.	Emergency Preparedness and Respond Plan for construction phase	Prior to financial closing
1.7	Prepare an EPRP for the operational phase	EPRP for the operational phase	Prior to financial closing
1.8	Prepare a Stakeholder Engagement Plan (SEP)	Stakeholder Engagement Plan (SEP)	Prior to financial closing
1.9	Present a plan for community informed consultation and participation	Community Consultation and Participation Plan	Prior to financial closing
1.10	Present a community (external) grievance mechanism.	Community (external) grievance mechanism	Prior to financial closing
1.11	Present a plan for ongoing reporting for affected communities.	Plan for ongoing reporting	Prior to financial closing
2.0 Labor and Working Conditions			
2.1	Prepare a human resources policy	Human resources policy	Prior to financial closing
2.2	Prepare a Code of Work	Code of Work	Prior to financial closing
2.3	Develop and approve a training program for workers	Training program	Prior to financial closing
2.4	Prepare and adopt a Worker Accommodation Plan	Worker Accommodation Plan	Prior to financial closing
2.5	Prepare and adopt a worker retrenchment plan	Worker retrenchment plan	Prior to financial closing
2.6	Develop and adopt an internal (workers) grievance mechanism.	Internal (workers) grievance mechanism	Prior to financial closing
2.7	Develop an occupational health and safety plan for the construction phase.	OHSP for the construction phase	Prior to financial closing
2.8	Update OHSP plan prior to operation commencement.	Updated OHSP	Prior to financial closing
3.0 Resource Efficiency and Pollution Prevention			
3.1	Estimate the annual GHG to be produced by the Project.	GHG estimates	Prior to financial closing
4.0 Community Health, Safety, and Security			
Community Safety and security			
4.1	Develop a community health and safety plan.	Community health and safety plan	Prior to financial closing
4.2	Prepare a hazardous material and explosives management plan.	Hazardous material and explosives management plan	Prior to financial closing
4.3	Prepare and provide a copy of the Code of Conduct of for the security firm to be hired.	Code of Conduct	Prior to financial closing

N°	Action	Deliverables	Proposed Deadline
4.4	Include in the contract to be signed with the security firm, provisions to comply with PS4.	Copy of the contract	Prior to financial closing
6.0 Biodiversity Conservation and Natural Habitats			
6.1	Present and ecosystem assessment.	Ecosystem assessment	Prior to financial closing
8.0 Cultural Heritage			
8.1	Present an assessment of possible impact to cultural heritage and archaeological sites.	Assessment	Prior to financial closing
8.2	Present a chance fin procedure	Chance find procedure	Prior to financial closing
8.3	Obtain a response from the Chilean Council of National Monuments about mitigation and compensation measures related to the Geoglifos de Chug Chug.	Letter, authorization, etc.	Prior to financial closing
8.4	Provide evidence of public consultation on heritage issues	Minutes	Prior to financial closing