

WATER AND EFFLUENTS

Strategic Significance

Ensuring long-term water availability is a critical consideration for companies across all industries particularly given changing climatic conditions and increasing demands on the world's natural resources. As a brine-based lithium producer operating in an arid region of the world, Orocobre is no exception to this reality.

Fortunately, the Olaroz Lithium Facility is located in a region classified by the WRI Aqueduct Tool as having low water stress and low overall water risk. This status is not projected to change through to 2030, even based on the most pessimistic climate forecast scenario.

Located at the base of the Archibarca Basin, the Olaroz Lithium Facility does not draw on surface water or fresh groundwater. The Company relies on industrial groundwater, unfit for human or agricultural consumption, which is treated via reverse osmosis onsite prior to use in the production process.

Orocobre's lithium production process and technology has one of the lowest water consumption ratios in the industry. Approximately 50 percent of the groundwater extracted is treated for use in the production process, while the other 50 percent is used to maintain access roads and other infrastructure, to support camp activities and to provide suitable living conditions for the Company's workforce.

The Company does not discharge water to surface water sources. Effluents are either treated on site and reused for road construction and maintenance or transported to the provincial water treatment facility to be recycled. Increasing the effectiveness of effluent management on site increases the water that can be reused for road construction and maintenance, thus reducing groundwater consumption and extraction.

Orocobre is very conscious of stakeholder perceptions regarding water use within its operations.

The evaporation ponds are often perceived to contain water when they actually contain brine, the mineral resource from which lithium is extracted. Brine has a salt concentration of ~400g/L (seawater is 36g/L) so is far too saline to be considered a water resource. Given the historical example of brine-based lithium production in the Atacama region of Chile (a region classified as high water risk), Orocobre's stakeholders often assume that the Olaroz Lithium Facility will have the same challenges and impacts. These are common misperceptions that can only be addressed with clear and transparent data and communications.

Ensuring responsible, efficient and transparent management of water resources is fundamental for Orocobre to maintain its social licence to operate in the region.

Aside from operational water management, Orocobre recognizes that access to clean water and sanitation is a long-standing development issue in the local communities. While the Company's operations do not impact negatively on this reality, Orocobre acknowledges the unique opportunity it has to contribute to addressing this issue through targeted programs and initiatives.

Impact Boundary

This management approach disclosure refers exclusively to Sales de Jujuy S.A. and its activities. Water and effluent management remain a core focus of operational and expansion activities at the Olaroz Lithium Facility.

Orocobre does not report supplier performance with regards to water consumption given that the only water consumed on site (excluding water for human consumption which is purchased and transported onto site) is extracted and managed by its operations or expansion teams. As such, total consumption figures inevitably include supplier related activity on site.

Access to clean water and sanitation in local communities is treated independently from the Company's operational management of water resources. Information regarding its activities in this area can be found in the [Community Investment](#) disclosures.

Management Approach

Commitment

The following policies outline the Orocobre's commitment to water and effluent management:

- [Environmental Policy](#)
- [Sustainable Development Policy](#)

As part of Orocobre's commitment to advancing [SDG 6: Clean Water and Sanitation](#) the Company is constantly seeking to i) increase water-use efficiency and ii) protect water-related ecosystems.

The company is also operating in alignment with the [CEO Water Mandate](#) which is a UN Global Compact initiative promoting action across six key elements: direct operations, supply chain and watershed management, collective action, public policy, community engagement and transparency.

Management Systems

Orocobre's operations have an ISO certified Environmental Management System (ISO14001) which sets out the approach to water and effluent management.

The Company regularly reviews opportunities for reduction as part of its continuous improvement program which allows all employees and site-based operators to propose opportunities for improved performance across all aspects of its operations.

Monitoring and Reporting

Orocobre evaluates the effectiveness of its management approach through regular monitoring and reporting of key data, metrics and tracking progress against predefined objectives and targets. Internal data and reporting processes include daily operational updates, weekly operational performance reviews and monthly reporting on progress against operational targets.

Orocobre's first year of operations was 2015 and every year since then the Company has improved the structure and management of its water data to enable more detailed insights into consumption patterns.

Water performance is reported annually in the Company's [Sustainability Report](#) and also in response to investor surveys such as S&P's Corporate Sustainability Assessment (formerly DJSI/RobecoSAM) and the CDP Water Disclosures.

Short, medium- and long-term reduction targets are defined and monitored by Orocobre's Executive team in collaboration with the relevant operational teams.

Responsibility

At an operational level, responsibility for water extraction initiatives and the maintenance of local water ecosystems sits with the Director of Hydrogeology while responsibility for water consumption and operational efficiency, including the evaluation and implementation of reduction initiatives, sits with the Manager of Operations.

The Environmental Manager within the compliance team monitors water performance and works in close collaboration with departments of greatest impact (including the hydrogeology and process teams) to identify and evaluate opportunities for performance improvement.

Accountability

In accordance with the commitments defined in the CEO Water Mandate the Company is integrating KPIs into the performance evaluation process for specific managers and employees at an operational level.

Orocobre’s Executive and Board performance process is also being reviewed to incorporate water-related performance into their short term and long-term incentive criteria.

FY19 Update

Orocobre’s overall water extraction increased in FY19 due to additional demands from Expansion activity on site.

That said, operational water intensity – i.e. the amount of water extracted exclusively for operations per ton of lithium produced – decreased from 48.73m³/t to 48.16m³/t.

FY19 has seen a significant increase in the number of personnel onsite primarily due to the increase in activities associated with the Stage 2 Expansion. Orocobre has therefore been ensuring adequate site-based infrastructure is in place to manage the additional effluents generated.

An additional sewage treatment plant (STP) was installed in FY17 and this has been made fully operational in FY19 with the installation of additional storage tanks and improved STP management to extract what cannot be treated and cushion generation peaks.

The focus in FY20 is on maintaining optimal effluent plant operations and minimizing the amount of effluent sent to Jujuy for treatment. To achieve this, constant adjustments are being made to the STP to improve its performance in aeration capacity and system returns. Different pretreatment tests are being conducted with aerators in the pumping wells, installation and maintenance of solids separation baskets as well as a detailed study of the operation’s equipment and each stage of the sewer system. The Company is also evaluating a new sewage system that will improve the quality of the effluent entering the treatment plants.

Acknowledging the increased focus on water risk and broader water stewardship, Orocobre has sought to align with the CEO Water Mandate to reaffirm the organisation’s commitment and to align with global best practice in water management and reporting.

In FY20, the Company will focus on structuring its water data and disclosures in alignment with the six commitment areas set out in the CEO Water Mandate and adopting a more strategic and comprehensive approach to water management in each of these areas.

FY20 will also see the installation of over 50 flowmeters across the operational site to improve visibility and granularity of consumption data, and the evaluation and implementation of new water saving technologies and process improvements to reduce operational water intensity.

INDICATOR	Current	PRELIMINARY TARGETS (to be finalised in FY20)		
	FY19	FY20	FY25	FY30
Operational Water Intensity (m ³ /t LCE)	48,16	< 48	< 45	< 35
% Effluents Treated On-Site	50%	75%	100%	100%

For more Water data refer to the [Environmental Performance Data](#)

CEO WATER MANDATE

Commitment Areas	Context	Risks & Opportunities	Actions
Direct Operations	Water Extraction Water treatment (effluents)	Reduce operational water intensity Improve effluents management	<ul style="list-style-type: none"> - Install flowmeters to enhance the quality and granularity of water consumption data and better assess reduction opportunities. - Set targets for water consumption and effluents management. - Investigate new technologies to enhance water intensity. - Raise awareness of water management and quality at site and corporate level.
Supply Chain and Watershed Management	Collective Impact (industry peers)	Lack of transparency Peer extraction activity impacts Company access to water resources.	<ul style="list-style-type: none"> - Engage with industry peers to ensure greater transparency and in turn improved management of the basin and aquifers. - Build capacities to analyse and respond to shared water risk.
Collective Action	Lack of NGO presence in the operating region Responsible and committed government	Experts addressing local community water and sanitation issues Government keen to manage resources well	<ul style="list-style-type: none"> - Proactively engage NGOs specialising in water and region-specific water challenges - Work with the provincial government to address water sustainability issues and policies.
Public Policy	Provincial government sets water permits and policies.	Policy defined based on standard mining activity, not lithium mining activity.	<ul style="list-style-type: none"> - Work with provincial government to better understand the water balance in the basin. - Support provincial government understanding of effective policies to address water-related risks and impacts specific to lithium production and salt-lake ecosystems.
Community Engagement	Communities supportive of mining activity but water remains a primary concern	Community perceptions of water impact	<ul style="list-style-type: none"> - Discuss water and sanitation challenges in the local communities - Encourage and support initiatives to advance water and sanitation - Undertake water-resource education and awareness campaigns in partnership with local stakeholders.
Transparency	Water consumption and extraction data	Low water-intensity process Greater transparency increases stakeholder trust	<ul style="list-style-type: none"> - Water and Effluent related disclosures in Annual Sustainability Report - Be transparent with governments and other public authorities on water issues - Share water quality and extraction data with local communities