



# MINING VANADIUM RESPONSIBLY

2018 ENVIRONMENTAL, SOCIAL  
AND GOVERNANCE REPORT

# LARGO RESOURCES LTD.



## ONE OF ONLY THREE

global primary  
producers of vanadium



## \$316 MILLION<sup>1</sup>

net income and earnings  
per share of \$0.61 in 2018



## 9 YEARS MINE LIFE

with a potential 12 years more  
from satellite deposits<sup>2</sup>



**1.15%** head grade  
and **3.21%**

concentrate grade<sup>3</sup> at the Campbell Pit, among the highest  
known grade deposits of vanadium in the world



Vanadium is a strategic metal that is primarily used as a strengthening alloy to steel and titanium. In its pure form, vanadium is a soft, grey, ductile element primarily derived from mined iron ore and steel slag.

Adding a small amount of vanadium forms carbides in steel and promotes fine grain size, a process which imparts hardness, wear resistance, seismic resistance and increased strength to the steel.

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<sup>1</sup> All currency CAD dollars unless otherwise stated. <sup>2,3</sup> Maracás Menchen Project, Bahia, Brazil, Independent Technical Report - An updated Mine Plan, Mineral Reserve and Preliminary Economic Assessment of Inferred Resources. October 26, 2017 (effective date May 2, 2017).

Note: Largo Resources Ltd. may be referred to as the "Company", "Largo", "we" or "our" in this report. For any forward-looking statements in this report see Cautionary Statements.



## One of the Lowest-Cost Primary Producers of Vanadium



**70%+  
DECREASE**

in lost time incidents,  
2015 to 2018

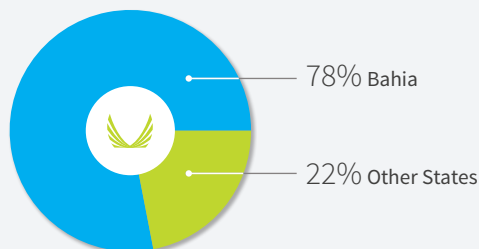


**99%+ BRAZILIAN  
EMPLOYEES**

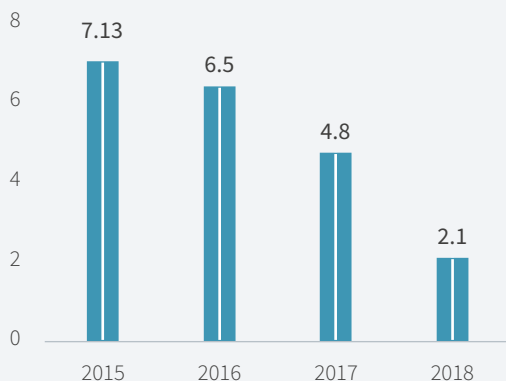
78% from Bahia province at  
the Maracás Menchen Mine



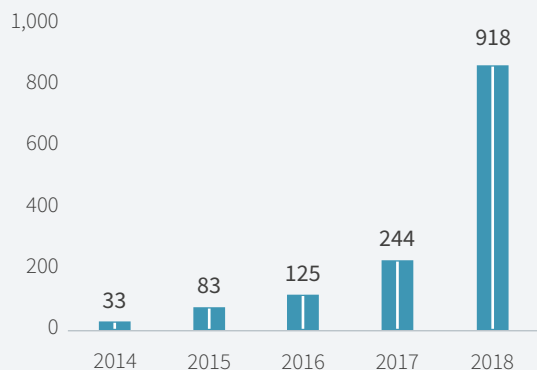
**358**  
TOTAL EMPLOYEES AT THE  
MARACÁS MENCHEN MINE



**LTI - FREQUENCY RATE**



**INVESTMENT IN TRAINING  
AND DEVELOPMENT (IN R\$ '000)**



# OUR VISION

To become a leading, world-class mining company focused on responsible development and strategic growth while maintaining the respect of investors, employees, customers and partner communities.



# OUR STRATEGY

To be the preferred choice for our shareholders, communities and workforce by creating sustainable shareholder value through exceptional operational performance, superior quality, responsible development and strategic capital investments.

Based in Toronto Canada, Largo Resources Ltd. is a strategic mineral company focused on producing standard vanadium ( $V_2O_5$ ) flake, high purity  $V_2O_5$  flake and high purity  $V_2O_5$  powder from the Maracás Menchen Mine in Bahia State, Brazil.

The Company also has three additional projects: the Campo Alegre de Lourdes project in Bahia State, Brazil, the Currais Novos project in Rio Grande do Norte province, Brazil, and the Northern Dancer project in Yukon Territory, Canada.





# ABOUT THIS REPORT



Largo is proud to present its inaugural Environmental, Social and Governance (ESG) Report, which highlights our achievements and directions in 2018. This report sets guidelines and establishes benchmarks for future reports and marks a public commitment to transparency in reporting.

This report covers the period from January 1 through December 31, 2018 and is based on data collected during that period. We do not report on the environmental and broader sustainability aspects of our Canadian head office. For any questions regarding this report or its contents please contact us at [info@largoresources.com](mailto:info@largoresources.com).

## OUR STAKEHOLDERS

This report is written for our key stakeholders, including:

- our employees and their families
- the people of the communities in which we operate
- legislators, regulators and government officials
- civic and non-governmental organizations (NGOs)

- our shareholders and business partners
- private and government institutions and service providers

The identification of key stakeholders is an ongoing process, and we strive to maintain open and constructive dialogue with each of our stakeholder groups. Senior management meets frequently with stakeholders. Mine personnel make community visits at least twice per month, and community members often contact local representatives. When there is demand, meetings are held in a neutral place in the community, and the community is always invited through their representatives and local leaders.

We maintain an active social media presence on Instagram, Facebook and Twitter to maintain communication with the community. A newspaper, which was used in the past for updates on mine operations and environmental subjects, has been resumed in 2019.

## COMMENTS AND COMPLAINTS

Employees and contractors are encouraged to provide feedback. We maintain an anonymous reporting system, including an anonymous phone number, web portal, e-mail address and postal address for any employees or contractors with concerns regarding unethical conduct, corruption, or non-compliance with laws or policies.

The dedicated email [faleconosco@largoresources.com](mailto:faleconosco@largoresources.com) is available for community complaints or suggestions. Stakeholders or the general public can contact the Directors or Executive Officers regarding our sustainability performance, at the head office, at the Company's Annual General Meeting, or by e-mail at [info@largoresources.com](mailto:info@largoresources.com).

## BOUNDARIES OF THIS REPORT

The information in this report relates only to Largo's sustainability policies and practices. Economic performance is not discussed in detail, nor is technical and operational data about our mine or projects. For financial results, please visit our website at [www.largoresources.com](http://www.largoresources.com) and [www.sedar.com](http://www.sedar.com). No external assurance was sought for the content of the report.







# LETTER FROM THE CEO



Mark A. Smith, Chief Executive Officer

Building on our track record of responsible mining and strong community relations, this report sets a new standard for open and transparent reporting of our sustainability performance.



Welcome to Largo's first annual ESG report. After a banner year in which we produced record quantities of vanadium and earned record net income, we have reached a turning point. Building on our track record of responsible mining and strong community relations, this report sets a new standard for open and transparent reporting of our sustainability performance. It provides key indicators and measurements that we will use as benchmarks for reporting in years to come.

What does it mean to mine vanadium responsibly? First and foremost it means protecting the health and safety of our people. As you will see in this report, our safety metrics have experienced steady year-on-year improvement since the Maracás Menchen Mine began initial production in 2014. I want to commend our safety team, with special note of their extraordinarily effective communications strategies. Using everything from traditional signage to social media platforms like Facebook and Instagram, they are reinforcing a safety-first culture by delivering their messages right into the palms of our workers' – and their families' – hands.

As a mining company, environmental stewardship is critical to all of our stakeholders. We are justifiably proud of our track record and we continuously monitor our performance and post the results on our website within our corporate presentation for complete transparency. It is very important to note that vanadium is an essential commodity for a greener future: it makes steel stronger, which translates into lighter, more fuel-efficient vehicles.

In the Jiquiriçá Valley, not far from our mine, we maintain a 1,200 hectare wilderness preserve within the San Conrado farm. Overseen by INEMA, the *Instituto do Meio Ambiente e Recursos Hidricos* (Institute of Environment and Water Resources), animals found near the mine are transported and released there. Our respect for the richness and diversity of the area's ecosystems led us to fund six years of research and a scholarship which resulted in the publication of a textbook, titled *A Fauna e a Flora na Área de Vanádio de Maracás* which is now widely used in the local communities.





Since 2014, we have made countless community contributions – far beyond any legal requirements. We have donated vehicles from police cars and ambulances to a truck to carry beehives. We have reintroduced a newspaper back into circulation and restarted a dormant agricultural festival. We have donated community lodges and supported sports and cultural activities. As a direct result of our presence, we have seen a resurgence of economic activity and social vibrancy throughout the entire area surrounding the mine.

In 2018, we refined our community consultation methodology: we established a formal, scheduled process through which we discuss each community's needs and wants. We then base our strategies on their expressed needs, and only proceed on their approval.

For Largo, corporate social responsibility means keeping our people safe and healthy. It means minimizing and mitigating our impacts on the environment and practicing continual reclamation of affected land.

It means sharing the benefits of mining with the communities in which we live and operate.

It means acting ethically, as a company and as individuals. Largo's first annual ESG Report is a tangible indication of our commitment to mining vanadium responsibly and we look forward to continuing this tradition in the years to come.

Mark A. Smith  
*Chief Executive Officer*

# THE MARACÁS MENCHEN MINE



The mine boasts one of the highest-grade vanadium resources in the world and is one of the lowest-cost producers in the vanadium market.



Located in Bahia State, the Maracás Menchen Mine is on a 17,690 hectare property approximately 813 km northeast of Brasília (capital of Brazil). The nearby town of Maracás has a population of approximately 30,000 people.

The mine boasts one of the highest-grade vanadium resources in the world and is one of the lowest-cost

producers in the vanadium market. Construction on the mine began in June 2012 and initial production commenced in the third quarter of 2014. **Construction is underway on an expansion project which will increase production capacity by an additional 200 tonnes of  $V_2O_5$  per month, raising the capacity to 1,000 tonnes per month by the end of Q3 2019.**

TABLE 1

## MARACÁS MENCHEN MINE HIGHLIGHTS

|  |   |
|--|---|
| Ownership  | 99.94%  |
| Location   | Bahia State, Brazil   |
| Products   | Vanadium (Standard $V_2O_5$ flake, High-purity $V_2O_5$ flake & powder) |
| 2018 production                                  | Open pit  |
| 2019 guidance                                    | 9,830 tonnes of $V_2O_5$ flake and powder                               |
| 2019 cash operating cost <sup>(1)</sup> guidance | US\$3.45 – 3.65/lb $V_2O_5$ (excluding royalties)                       |
| Reserve life <sup>(2)</sup>                      | 9 years (Campbell Pit)  |

(1) Cash operating costs is a non-GAAP measure. Please see information on this non-GAAP measure in the "Non-GAAP Measures" section of the Company's Management Discussion and Analysis for the year ended December 31, 2018.

(2) Maracas Menchen Project, Bahia, Brazil, Independent Technical Report - An updated Mine Plan, Mineral Reserve and Preliminary Economic Assessment of Inferred Resources. October 26, 2017 (effective date May 2, 2017).







# OUR PEOPLE



We seek to recruit the best, and to train our employees for rewarding careers with Largo. We take great care in the employment process, with an emphasis on equality, diversity, workplace safety and employee welfare.



The success of our business depends on our ability to recruit and retain the most promising employees – people who share our commitment to safe, sustainable development that benefits all stakeholders.

We seek to recruit the best, and to train our employees for rewarding careers with Largo. We take great care in the employment process, with an emphasis on equality, diversity, workplace safety and employee welfare.

The vast majority of the employees at head office and at our mine are employed full-time. Our mine workers are unionized, and the collective bargaining agreement is negotiated annually. We actively pursue the hiring of local people, in support of our efforts to develop and maintain positive relationships with nearby communities. Nearly the entire staff at the Maracás Menchen Mine is Brazilian and more than three-quarters of the workers are from Bahia province.

We put a priority on using locally sourced products and services whenever practical, to benefit the local and regional economy. We wish to ensure that our presence in

TABLE 2

## EMPLOYEES AND CONTRACTORS MARACÁS MENCHEN MINE

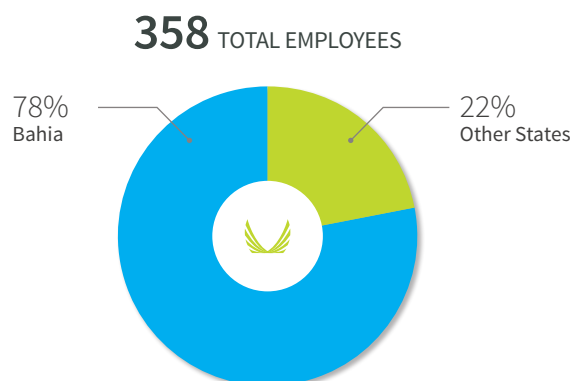
### Employees

| 2016 | 2017 | 2018 |
|------|------|------|
| 329  | 338  | 358  |

### Contractors

| 2016 | 2017 | 2018 |
|------|------|------|
| 309  | 435  | 463  |

*\*As of Dec 31 of the year*



the local and regional economy provides the maximum in direct economic and social benefits to individuals, their families and other community members.

**TABLE 3**  
**STAFF, GENDER AND ENTRY-LEVEL WAGES, 2018**

|   |  |
|---|--|
| Total employees (Head office and mine)                | 390* including interns and apprentices                           |
| Gender distribution                                   | Male: 89%, Female: 11%   |
| Standard entry-level wage (compared to local minimum) | Male: 52% above local minimum<br>Female: 52% above local minimum |
| Number of new employees (2018)                        | 21   |
| Employees dismissed (2018)                            | 6  |
| Parental leave provided?                              | Yes  |

*\*As of Dec 31 of the year*

### MEASURING PERFORMANCE AT THE MARACÁS MENCHEN MINE

We believe an engaged workforce drives performance. Twice a year, every employee meets with their manager for a performance and career development review. After these reviews, employees may be selected for additional training to upgrade their skills and improve their careers.

### TRAINING AND DEVELOPMENT

Every new employee receives introductory and safety training. On an ongoing basis employees receive additional training and professional development – on average employees receive 48 hours of internal training per year. If employees wish to pursue additional company-related skills upgrading or education, the Company will pay up to 70% of the tuition (on approval).

### HUMAN RIGHTS, DIVERSITY AND NON-DISCRIMINATION

Largo does not discriminate on the basis of race, religion, ethnicity, national origin, colour, gender, age, sexual orientation, citizenship, veteran status, marital status or disability or any other grounds prohibited by law. Harassment, including sexual, physical and verbal, is prohibited. We treat our people fairly and without discrimination, with full regard for their human rights. There were no incidents of discrimination reported to the Company in 2018. We do not allow forced or compulsory labour, nor will we knowingly employ a person who is under the legal age of employment.

In 2019, we plan to formalize our human rights training and include human rights topics in our introductory training for new hires, including security staff, and also include human rights topics in employees' annual training updates.

### HUMAN RIGHTS AND OUR SUPPLY CHAIN

All suppliers and contractors that interact with the Maracás Menchen Mine are required to sign its Terms of Business Commitment, which obligates them to follow strict Brazilian legislation and adhere to good practices of social responsibility. These practices include non-discrimination, respect for human rights, the obligation to provide a safe and healthy working environment for their people, and respect for the safety codes and policies in place at the mine.

### ETHICS AND CORRUPTION

Largo has strong policies regarding ethics and corruption, and maintains anonymous channels for complaints. No legal actions have ever been taken against Largo or its subsidiaries in relation to anti-competitive or anti-trust behaviour.



# HEALTH AND SAFETY



Our health and safety mission:  
to ensure a safe work  
environment where each person  
returns home healthy.



Building and maintaining a safety culture is a continuous process, and we invest heavily in creating a safe, healthy working environment at our mine.

-  **Our health and safety mission:** to ensure a safe work environment where each person returns home healthy.
-  **Our health and safety vision:** to control all activities of high potential risk and to achieve “zero damage” to our people’s health.

Our safety mission begins before an employee’s first day of work in the mine: before they can start work, every mine employee completes a safety program, with training on the risks and hazards of the job and essential safety knowledge and practices, such as respiratory protection, safety equipment and emergency planning.

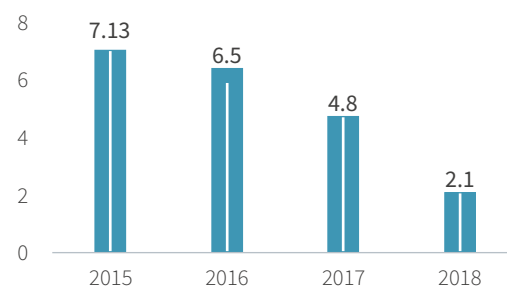
All employees are given medical checks to track their occupational and general health. Annually, and during maintenance periods, employees are given blood tests to monitor levels of vanadium exposure.

## CREATING A CULTURE OF SAFETY

Our Safety Leadership program is an integral component of our safety culture. Every safety leader (whether an employee or a contractor) participates in this continuous improvement program. Risk analyses are performed on a regular basis, contractors are audited for their safety standards, and mine management do regular “Safety Walks.”

All contractors are required to follow the same safety policies and procedures as employees. In addition, Fagundes, which employs approximately 35% of the total contractors working at the mine, adheres to all Maracás Menchen Mine policies and procedures.

### LTI - FREQUENCY RATE







Throughout the mine, signage campaigns reinforce the importance of proper dress and attire. Signage emphasizes the **Five Golden Rules** (relating to the activities with the greatest risk or injury profiles) with penalties for those who fail to follow procedures.

Our strong safety culture has delivered consistent results: since 2015 Lost Time Incidents (LTIs) have dropped by more than 70%, and in 2018 the mine broke all company safety records to date.

In 2018 we initiated a **Safety Culture Diagnosis** to identify what we are doing right and where we can improve. The action plan that resulted is already underway. Also in 2018, we initiated a safety campaign, the “**New Safety Cycle**”, a risk-management program that is focused on middle management, to identify safety challenges and potential preventative actions.

#### COMMUNICATING SAFETY AWARENESS

Health and safety dialogues are held weekly between safety leaders and staff, to maintain direct

communications on issues of concern. Part of the mine’s active social media presence on Instagram and Facebook is intended to maintain safety awareness among employees and the local community – messages which often extend to disease prevention and issues of general concern.

**TABLE 4**

#### INJURY FREQUENCY

| Injuries and Incidents <sup>3</sup>                   | 2018            |
|---|-----------------|
| Injury frequency (TRIFR <sup>1</sup> )                | 6.7             |
| Lost-time injuries                                    | 4               |
| Lost-time injury frequency rate (LTIFR <sup>2</sup> ) | 2.1             |
| Fatalities  | 0 since startup |

<sup>1</sup> **TRIFR** is the number of injuries requiring treatment by a medical professional per 200,000 hours worked

<sup>2</sup> **LTIFR** is the number of LTI (injuries that resulted in lost work time) per 200,000 hours worked

<sup>3</sup> Safety metrics are inclusive of mine employees and contractors.

# OUR COMMUNITIES

At Largo, we understand the social and economic influence of the Maracás Menchen Mine in the local region. At all times we strive to operate in a manner that respects local communities and supports local culture and identity, while strengthening regional socio-economic development.



## SUPPORTING LOCAL BUSINESSES

We are committed to promoting the economic development of the region, with a focus on businesses and skills that will continue after the mine ceases to operate.

In 2018, 65% of the mine's purchases of materials and services were invested within the state of Bahia. From over 4,000 approved suppliers to the mine, 44% are located in Bahia.

## BUILDING INFRASTRUCTURE FOR HOUSING, HEALTH AND EDUCATION

In recent years, the Maracás Menchen Mine has funded, or provided buildings, facilities and equipment, to aid the community of Maracás and the surrounding region. Our contributions include renovations to the police stations in Porto Alegre and Maracás, and vehicles, including a police car and an ambulance.

The Maracás Lodge is a building that we renovated and donated in 2014. It is used by local associations and social programs, including:

- Projeto Jequiriça – Judo and Jiu Jitsu
- AMARR – which helps families of recovering dependents to generate income
- AMAA – the Animal Protection Association
- Active Women sewing project, to which we donated sewing machines
- Flores e Guardões – a sport and cycling association to which we donate sports clothing and provide sponsorships

In 2018 we donated a second company building, which will be used as the Porto Alegre Lodge. Renovations on the lodge began in June of 2019. The Porto Alegre Lodge will include spaces for local women, fishermen and farmers, where they will be able to improve their income generation potential. There will also be a nursery for local children. The combined value of the Maracás and Porto Alegre Lodges was R\$ 11.1 million.



In the Água Branca community, we invested R\$ 0.3 million in a new water treatment plant that will provide clean water for 350 people.

In 2019, contributions for the communities near the mine will include a mobile Intensive Care Unit, a mobile dental office, a Civil Guard vehicle and a pipe truck. We will donate ambulances to the villages of Pé de Serra and Porto Alegre. And, working with the Community Association of Pé de Serra, we will develop a sewing project for local women to generate income.

In 2019, we will begin a Management Plan for the source of the Jiquiriçá River, and rehabilitation work in the eucalyptus forest in Maracás.

#### TRAINING AND EDUCATION FOR THE WORKFORCE

To support the economies of our local communities, we offer skills training to help community members improve their qualifications for long-term employment. Our “Employment and Income” includes courses and technical training, including an apprentice program,






educational incentives for students in the community, and workforce training to help community members enter the labour market.

## HIGHLIGHTS

- 
**Electromechanical Technician Course:**  
 Graduated 200 students
- 
**Beekeeping:** Since 2015 we have supported the beekeepers association (the Maracaense Association of Beekeepers and Environmental Meliponicultores) and recently helped add 30 new apiarists to the association. We have improved their facilities, donated equipment and materials, provided a transport truck for hives and honey, and hired consultants.
- 
**Active Women:** We taught nearly 70 women in three communities the skills for running a sewing business: the multi-phase project included the donation of sewing machines and equipment, renovating workshop spaces, and providing instruction in sewing and cutting, entrepreneurship and marketing.



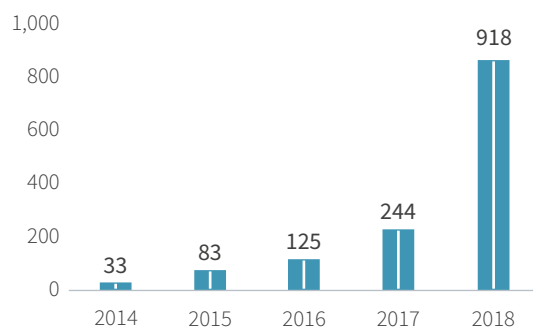
This is a component of the **AMARR** project, which helps women provide for themselves and their families while men are recovering from dependency.

- 
**ExpoMARACÁS:** An annual three-day event with over two thousand participants, ExpoMARACÁS provides lectures on farming, banking and government financing and agribusiness; it is held by the Municipal Department of Agriculture and Environment. The event had not been held for six years, but it has returned with Largo's sponsorship and support.





INVESTMENT IN TRAINING  
AND DEVELOPMENT (IN R\$ '000)







- 
**Recycling:** To assist local recyclers, we donated a truck, press and electric conveyor, and hired a consultant to the Maracaense Association of Recyclable Material Collectors, which improved its status and eliminated middlemen in recycling.
- 
**Farmers and fishers of Porto Alegre:** To assist local producers improve standards and professionalize their Association of Rural Producers of Porto Alegre, we donated equipment – forage, planting and bagging equipment for farmers, and a filleting table and stainless-steel tables for fishermen. In a second phase, we will assist in consulting with the city hall and other institutions.

#### SUPPORTING PUBLIC EDUCATION

Our **Maracás Educational Development Program** is intended to help raise educational standards and assist students, families and teachers in public and private schools of all levels. In 2018, our funding supported

242 school-age students and 268 adults (mine employees) in improving their education. 55% of the students were from Maracás and 45% from other nearby communities.

We have also equipped two computer labs in rural schools (to the benefit of over 500 students) and provided 14 computers for schools serving special-needs students.

#### SUPPORTING SPORT, ENTERTAINMENT AND CULTURE

Projeto Jequiriça (housed in the Maracás Lodge), is a hub of Judo and Jiu Jitsu instruction which has helped over 150 children, including the current state Jiu Jitsu champion, 16-year-old Luã Matos. In 2018, we sponsored, among other successful projects, a course on Citizenship and Public Policy; a renewed Civic Parade celebrating the history of Maracás, which had not been held for 13 years; a drawing and writing contest; and we helped publish two books written by students of the Porto Alegre Community.





In 2018, our funding supported 242 school-age students and 268 adults – mine employees – in improving their education.



# ENVIRONMENTAL PERFORMANCE



At Largo, we strive for responsible stewardship of the land, air and water in every aspect of our business. Since the Maracás Menchen Mine began operating in 2014, we have met or exceeded all applicable environmental standards and regulations.



At Largo, we strive for responsible stewardship of the land, air and water in every aspect of our business. Since the Maracás Menchen Mine began operating in 2014, we have met or exceeded all applicable environmental standards and regulations. There have been no fines or other legal actions against the mine for environmental issues.

## CARBON EMISSIONS AND CLIMATE CHANGE

We recognize the reality of climate change and our responsibilities, as an extractive industry, to take proactive measures to minimize emissions of greenhouse gases (GHGs). We include energy efficiency and emissions as serious considerations in our decision-making criteria.

TABLE 5

### ENERGY CONSUMED BY WEIGHT OR VOLUME

|                               |  |
|-------------------------------|--|
| Heavy Fuel Oil (HFO)          | 45 tonnes/day*   |
| Diesel                        | 24 tonnes/day<br>(considering the amount used in mine operations + industrial usage) |
| Liquefied Petroleum Gas (LPG) | 2,700 kg/month   |
| Electrical power              | 4,000 MW/h   |

\* 25% of HFO consumed is recycled from the Maracás Menchen Mine's thermoelectric power plant

## WATER STEWARDSHIP

To any mining operation – as well as to nearby communities – water management is of primary concern. Water for the Maracás Menchen Mine comes from one source, the reservoir of the Pedra Hydroelectric Power Plant, in the Rio de Contas River. The mine's average consumption for processing is 60 m<sup>3</sup> per hour, which is far lower than the 300 m<sup>3</sup> allowed by the mine's concession.

The mine does not discharge any liquid effluent. We are stringent in our water reuse policies, and all discharge, whether from rain or possible discharge from the processing plant, flows into a tank (with a capacity of 23,000 m<sup>3</sup>) and is reused in the processing plant. Between 91% and 96% of the water drawn is reused, depending on evaporation.

In accordance with legislation, we test local water quality for any possible pollution. Surface water quality is monitored from 15 test points and groundwater quality from 12 wells. Reports from our water quality monitoring are prepared for INEMA, under the terms of our operating license.





Between 91% and 96%  
of the water drawn is reused,  
depending on evaporation.







## TAILINGS AND WASTE MANAGEMENT

In recent years, tailings management has come under increased scrutiny throughout the mining industry. The tailings facilities at the Maracás Menchen Mine meet or exceed all applicable standards.

Every six months an independent inspector evaluates the tailings ponds. In addition, tailings ponds are inspected by mine employees every two weeks as required by law. The last inspection was in March 2019. Inspection results are available for viewing on the ANM (Brazilian Mining Department) website. ANM also inspects the entire mine site at least once a year. The last inspection was in August 2018.

Vanadium processing at the Maracás Menchen Mine generates four types of tailings:

-  **Waste from dry magnetic separation:** The ore is first crushed and then separated in a dry magnetic process. Non-magnetic waste, which is primarily silicates, is trucked to a controlled tailing pile.
-  **Non-magnetic waste:** After grinding, vanadium ore is separated in a wet-magnetic process. The non-magnetic waste is piped to a tailings facility.
-  **Calcined waste:** Ore passes through calcination and then to a leaching process, after which it is filtered and washed. The solid calcined waste is sent to a tailing dump for calcined waste. This waste contains hematite, an iron ore that may be recovered and sold in the future.
-  **Chloride waste:** Liquid and solid wastes from the vanadium chemical treatment plant are sent to a chloride tailings facility.

## MANAGEMENT OF HAZARDOUS AND NON-HAZARDOUS WASTE

Our waste management systems are designed and operated with the objective of reducing waste to landfill and reducing volumes of waste stockpiled over time. Whether the waste is classified as hazardous or non-hazardous, it is disposed of according to applicable environmental regulations. No waste of any kind is shipped internationally.

### NON-HAZARDOUS WASTE

Waste rock from the open pit mine is trucked and stored in controlled piles (following all environmental



regulations related to drainage distances) and will ultimately be recovered and re-vegetated. Process waste (from dry magnetic separation) is stored in piles, similar to waste rock. Other non-hazardous waste products – from uncontaminated metallic waste and rubber from conveyor belts to cardboard, paper and plastics – are sold or donated to recyclers from the Maracaense Association of Recyclable Material Collectors.

### HAZARDOUS WASTE

Waste from the Maracás Menchen Mine's industrial processes are classified as Class I and Class II Hazardous Waste. Any hazardous waste requiring transport is transported by legally and environmentally accredited service providers.

Separate tailings ponds are used for the wet waste products. Following environmental regulations, these ponds are located 200 m from drainage and protected areas and are sealed and lined. Waste from wet-magnetic separation is first pumped to a tailings pond and the water is recirculated for re-use in the mill. Waste from calcine, leaching and filtering is deposited in a “dry-stacking” procedure in a tailings facility, and chemical plant (chloride process) waste is stored in separate tailings ponds.

Other waste, such as pallets, metal parts and chemically contaminated materials are shipped to a certified industrial landfill.

**TABLE 6**  
**WASTE PRODUCTS BY VOLUME, PER YEAR**  
**(APPROXIMATE)**

|                           |   |
|---------------------------|---|
| Waste rock                | 7,000,000 tonnes                        |
| Dry non-magnetic waste    | 300,000 m <sup>3</sup> (600,000 tonnes) |
| Wet non-magnetic waste    | 300,000 m <sup>3</sup> (540,000 tonnes) |
| Calcined waste            | 200,000 m <sup>3</sup> (500,000 tonnes) |
| Chemical waste (chloride) | 25,000 m <sup>3</sup>                   |

#### WASTE FROM NON-INDUSTRIAL PROCESSES

Waste from food preparation, administration, recreation facilities, etc. is composted when appropriate, or made available to recyclers from the Maracaense Association of Recyclable Material Collectors or trucked to the city of Maracás landfill. Medical waste is disposed of by accredited providers.

#### AIR QUALITY AND EMISSIONS

In accordance to INEMA legislation, the Company monitors, and provides monthly reports on emissions from its six chimneys. In addition, there are four remote monitoring stations located:

- 3 km to the east
- 4 km to the west
- within the mine's industrial area
- in the community of Água Branca

Airborne articles below 10 µm, particulates greater than 10 µm, SO<sub>x</sub>, NO<sub>x</sub>, NH<sub>3</sub>, total vanadium and vanadium oxide are monitored.

#### OTHER IMPACTS

On a regular basis, mine staff monitors, and reports on a broad variety of possible indicators of any impacts that could affect the ecosystem or local communities.

Because dust from mining and trucking in and out of the mine is a concern, the mine has a watering program to minimize dust rising from unpaved roads.



#### PROTECTING BIODIVERSITY

The Maracás Menchen Mine is within the Caatinga biome, a semi-arid Brazilian biome of high biodiversity value which is protected by Brazilian legislation. Near the mine, river banks that are designated as Permanent Preservation Areas (APPs) are being preserved and actively re-vegetated, as many were deforested by previous activity. The Caatinga region includes a number of bird species and flora that are listed as in various stages of threat of extinction.

At Largo, we are committed to protecting and preserving the unique ecosystems of the Caatinga. We operate a comprehensive “Program for the Recovery of Degraded Areas” which includes studies and action plans for minimizing our environmental impacts and restoring affected areas for future use and/or environmental stability. Already, several areas have been successfully restored. In 2018, the program focused on topographically contouring and then landscaping a closed tailings pile and tailings ponds.





We have preserved several areas of virgin Caatinga ecosystem, notably the San Conrado Wilderness Preserve and the São Conrado farm, near where the open pit and mine processing is located.

#### **WILDERNESS PRESERVE WITHIN THE SAN CONRADO FARM**

The Wilderness Preserve near the Jiquiriçá Valley contains 1,200 hectares of native forest. Here we monitor the quality of soil, water, air, and strike to maintain native flora and fauna. Wild animals found near our mine or exploration activities are captured and released in the reserve. The legal reserve is home to 150 protected plant species, 30 species of amphibians, 15 species of reptiles, 140 different bird species and ten species of mammals.

The Wilderness Preserve is overseen by INEMA and any transportation of plant life or animal species must be approved prior to transport. When our mining activity requires the removal of plants, typical specimens are removed from the mining area and preserved in our nursery of native plants for use in future re-vegetation. Our greenhouse has the capacity to produce 20,000 trees, which are being cultivated for the reforestation of the surrounding

area. In the first years of managing the preserve, over R\$ 1 million has been invested in environmental projects.

#### **CELEBRATING THE AREA'S NATURAL WONDERS IN A BOOK**

Over six years, the mine's Environmental Responsibility team partnered with local biologists, authors and organizers to research, write and publish a comprehensive reference book on the flora and fauna of the Caatinga region. The book, entitled *A Fauna e a Flora na Área de Vanádio de Maracás* highlights the uniqueness of the area's plant and wildlife and what is being done to preserve its natural wealth and beauty. It is now a valuable resource for the entire community.

#### **MINE CLOSURE AND RECLAMATION**

Because all mines have a finite life, Largo maintains and regularly updates a closure plan for the Maracás Menchen Mine. The plan provides guidelines and financial expectations for the eventual closure of the mine, the decommissioning of its assets and the environmental recovery, reclamation of the affected areas and post-closure reclamation.





**TABLE 7**  
**MONITORING AND REPORTING INDICATORS OF IMPACTS**

|                     |   |
|---------------------|---|
| Aquatic biota       | Local rivers tested every six months (dry and rainy seasons)  |
| Drinking water      | Monthly testing of potability of the Water Treatment Station  |
| Flora               | Monthly monitoring of local plants through flowering, fruiting and seeding, to observe possible impacts |
| Environmental noise | Monthly, at 25 points in and near the plant   |
| Seismography        | Monthly in the industrial area and the Água Branca community  |



# CORPORATE GOVERNANCE












Largo is guided by a Board of Directors with a strong commitment to the principles of honesty, integrity and ethics in corporate governance. The Board promotes and encourages fair and transparent disclosure to investors and others through appropriate and practical systems of corporate governance and internal controls. As required, the Board is informed by management and maintains an open communications channel with members of Largo's senior management team. The Board also holds frequent scheduled meetings during which directors are kept informed of Largo's operations.

The Board periodically reviews existing policies and mandates in light of the Company's progress and the changing legal and regulatory landscape. The Board's committees provide additional oversight and report to the Board from time to time and as required under relevant law.

## CODE OF CONDUCT AND OTHER POLICIES AND BY-LAWS

The complete text of these documents is available as PDF files on [www.largoresources.com](http://www.largoresources.com), in the Corporate Governance section:

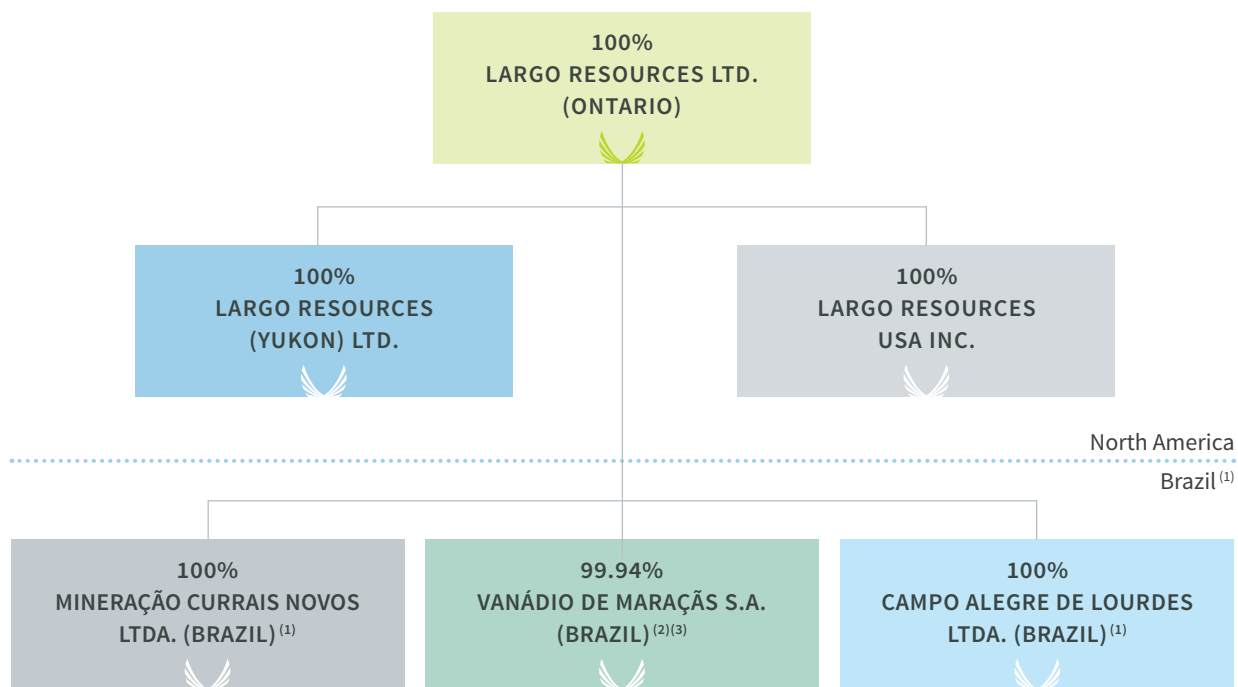
-  Safety, Environmental and Social Responsibility Policy
-  Anti-Bribery & Corruption Policy
-  Code of Business Conduct and Ethics
-  Corporate Disclosure Policy
-  Gifts & Hospitality Policy
-  Insider Trading Policy
-  Whistle Blowing Policy
-  Audit Committee Charter
-  Largo Resources By-Laws







**CORPORATE OWNERSHIP AND STRUCTURE**  
(as of Dec. 31/18)



- (1) Under Brazilian law, a corporation must have at least two shareholders or quota holders, as applicable. Shareholders or quota holders, as applicable, can be individuals or legal entities. Accordingly, Mr. Paulo Guimaraes Misk, President of the Brazilian operations of the Company, holds an interest of <0.001% (101 shares) and <0.017% (2 quotas) in the capital stock of Mineração Currais Novos Ltda. and Campo Alegre de Lourdes Ltda., respectively.
- (2) The remaining shares of Vanádio are owned by Companhia Baiana de Pesquisa Mineral, an entity controlled by the Brazilian State of Bahia, see also “Description of the Business – Material Project – Maracás Menchen Mine - Project Description, Location and Access”.
- (3) Holds a 100% interest in our Maracás Mine.

# CORPORATE DIRECTORY

## DIRECTORS

### **MARK A. SMITH**

Chief Executive Officer  
and Corporate Director

### **ALBERTO ARIAS**<sup>2,3</sup>

Corporate Director

### **DAVID BRACE**<sup>1,2,4</sup>

Corporate Director

### **JONATHAN LEE**

Corporate Director

### **DANIEL TELLECHEA**<sup>1,3,4</sup>

Corporate Director

### **KOKO YAMAMOTO**<sup>1,2,3</sup>

Corporate Director

## BOARD COMMITTEES

- 1 Member of the Audit Committee
- 2 Member of the Compensation Committee
- 3 Member of the Governance Committee
- 4 Member of the Operations Committee

## OFFICERS

### **MARK A. SMITH**

Chief Executive Officer  
and Corporate Director

### **ERNEST CLEAVE**

Chief Financial Officer

### **PAULO MISK**

President and  
Chief Operating Officer

## INVESTOR RELATIONS AND COMMUNICATIONS

### **ALEX GUTHRIE**

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## WEBSITE

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We welcome feedback on this  
report or on any other aspect of  
sustainability at Largo Resources.

Please contact us at:

[info@largoresources.com](mailto:info@largoresources.com)



This paper has been certified to meet the  
environmental and social standards of the  
Forest Stewardship Council® (FSC®) and  
comes from responsibly managed forests  
and/or verified recycled sources.

## FORWARD LOOKING INFORMATION

### Market and Industry Data

This corporate presentation of Largo Resources Ltd. ("Largo", or the "Company") includes market and industry data and forecasts that were obtained from third-party sources, industry publications and publicly available information. Third-party sources generally state that the information contained therein has been obtained from sources believed to be reliable, but there can be no assurance as to the accuracy or completeness of included information. Although management believes it to be reliable, management has not independently verified any of the data from third-party sources referred to in this presentation, or analyzed or verified the underlying studies or surveys relied upon or referred to by such sources, or ascertained the underlying economic assumptions relied upon by such sources.

### Forward-Looking Statements

This corporate presentation contains "forward-looking information" within the meaning of applicable Canadian securities laws and "forward-looking statements" within the meaning of the United States Private Securities Litigation Reform Act of 1995, (together, "forward-looking statements"), concerning the business, operations and financial performance and condition of the Company. Forward-looking statements include, but are not limited to, statements with respect to the estimation of mineral reserves and mineral resources; the realization of mineral reserve estimates; the timing and amount of estimated future production; costs of production; metal prices and demand for materials; capital expenditures; success of exploration and development activities; permitting time lines and permitting, mining or processing issues; government regulation of mining operations; environmental risks; and title disputes or claims. Generally, forward-looking statements can be identified by the use of forward-looking terminology such as "plans," "expects" or "does not expect," "is expected," "budget," "scheduled," "estimates," "forecasts," "intends," "anticipates" or "does not anticipate," "believes," "projects" or variations of such words and phrases or state that certain actions, events or results "may," "could," "would," "might" or "will be taken," "occur" or "be achieved." Forward-looking statements are based on the opinions and estimates of management as of the date such statements are made, and they are subject to known and unknown risks, uncertainties and other factors that may cause the actual results, level of activity, performance or achievements of the Company to be materially different from those expressed or implied by such forward-looking statements, including, but not limited to, unexpected events during operations; variations in ore grade; risks inherent in the mining industry; delay or failure to receive board approvals; timing and availability of external financing on acceptable terms; risks relating to international operations; actual results of exploration activities; conclusions of economic valuations; changes in project parameters as plans continue to be refined; and fluctuating metal prices and currency exchange rates. Although management of the Company has attempted to identify important factors that could cause actual results to differ materially from those contained in forward-looking statements, there may be other factors that cause results not to be as anticipated, estimated or intended. There can be no assurance that such statements will prove to be accurate, as actual results and future events could differ materially from those anticipated in such statements. Accordingly, readers should not place undue reliance on forward-looking statements. The Company cautions readers not to place undue reliance on forward-looking statements, as forward-looking statements involve significant risks and uncertainties. Forward-looking statements should not be read as guarantees of future performance or results and will not necessarily be accurate indications of whether or not the times at or by which such performance or results will be achieved. The Company does not undertake to update any forward-looking statements except in accordance with applicable Canadian securities laws.

Investors are advised that National Instrument 43-101 Standards for disclosure for Mineral Projects ("NI 43-101") of the Canadian Securities Administrators requires that each category of mineral reserves and mineral resources be reported separately. Mineral resources that are not mineral reserves do not have demonstrated economic viability.

### Cautionary Note to U.S. Investors Concerning Estimates of Measured, Indicated or Inferred Resources

This corporate presentation uses the terms "measured," "indicated" and "inferred" mineral resources. United States investors are advised that while such terms are recognized and required by Canadian regulations, the United States Securities and Exchange Commission does not recognize these terms. "Inferred mineral resources" have a great amount of uncertainty as to their existence, and as to their economic and legal feasibility. It cannot be assumed that all or any part of an inferred mineral resource will ever be upgraded to a higher category. Under Canadian rules, estimates of inferred mineral resources may not form the basis of feasibility or other economic studies. United States investors are cautioned not to assume that all or any part of measured or indicated mineral resources will ever be converted into mineral reserves. United States investors are also cautioned not to assume that all or any part of an inferred mineral resource exists, or is economically or legally mineable.

Except as otherwise specifically stated, Mr. Paul Sarjeant B.Sc, Manager of Geology to Largo, and a Qualified Person as defined by NI 43-101 has reviewed and approved the scientific and technical disclosure contained herein.





This is Largo Resources' inaugural Environment, Social and Governance (ESG) Report. It highlights our achievements and directions in sustainability and marks our public commitment to transparency in reporting. We welcome your comments on this report and on our sustainability performance.



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