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**Mining & Water Risk Management Case Study:
Exxaro Resources Ltd.**

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The Challenge

Freshwater scarcity threatens numerous industries across the globe, including the metals and mining sector. Water is used in numerous activities in mining, from processing and dust suppression to transport. The sector is therefore highly dependent on a consistent supply of water. Yet, the need for adequate quality and high volumes, along with the resulting pollution from operations, expose the sector to numerous water-related risks. Further, many of the world's mining reserves are located in water-scarce regions, such as Chile, South Africa, and the Middle East, where corporations compete with municipal, agricultural, and industrial demands. Conflicting demands for water can lead to temporary plant shutdowns or in worst case scenarios, loss of the license to operate, resulting in stranded assets and significant financial repercussions.¹

According to the CDP, one third of reporting metals and mining companies had operations in regions of high water scarcity or water stress in 2013.² 92% of respondents also reported exposure to water risks that have the potential to impact their business now or within the next five years.³ Already, companies are experiencing physical, regulatory, financial, and reputational risks related to water that threaten their growth and license to operate. In 2015, almost two-thirds of companies in the materials sector reported experiencing detrimental water-related impacts. The top reported impacts were higher operating costs, transport disruption, and plant/production disrupt that led to reduced output. These disruptions have resulted in reduced CAPEX, lower revenues, increased operating costs, and reduced shareholder value.⁴ In fact, companies reported losses as high as 6.5% of EBITDA (FY 2011).⁵ As one of the most water-intensive industries, future mining growth depends on securing a stable supply.

Along with other large mining companies like Anglo American and Rio Tinto, Exxaro Resources has experienced significant negative impacts related to water risks. Exxaro is one of South Africa's largest diversified resource groups, producing over 39 million tons of coal annually and operating base metal and mineral sand mines throughout South Africa, Botswana, Australia, and the Republic of the Congo.⁶ As additional background, the 2015 annual report reflects the following information:

- ,Exxaro's sales and profits have grown year to year driven by:
 - Higher coal sales due to a depressed rand (South African dollar). Moreover, no contracts were up for renewal. Encouragingly the company experienced sales growth in the face of heavy pressure from low cost Chinese imports

¹ CDP Worldwide. 2013. Metals and Mining Sector Under Water Pressure.

² CDP Worldwide. 2013. Metals and Mining Sector Under Water Pressure.

³ CDP Worldwide. 2013. Metals and Mining Sector Under Water Pressure.

⁴ CDP Worldwide. Global Water Report 2015.

⁵ CDP Worldwide. 2013. Metals and Mining Sector Under Water Pressure.

⁶ Exxaro Resources CDP Water Report 2015.

- Operational efficiencies predominately driven by employee termination packages
- Outlook is cautious given concerns around a possible credit downgrading of the South African economy, downward pressure on pricing, offset by still strong international demand for Exxaro's coal

SUMMARISED GROUP STATEMENT OF COMPREHENSIVE INCOME (Rm)		
for the year ended 31 December	FY15	FY14
Revenue	18 330	16 401
Operating expenses	(13 408)	(15 197)
Impairment charges of non-current assets	(1 749)	(5 962)
Net operating profit/(loss)	3 173	(3 292)
Net financing cost	(668)	(103)
Income from financial assets	1	9
Share of (loss)/income from equity-accounted investments	(1 137)	2 515
Profit/(loss) before tax	1 369	(871)
Income tax expense	(1 102)	(13)
Profit/(loss) for the year	267	(884)

In their 2015 CDP Water Disclosure Report, Exxaro cites the availability of a sufficient amount of freshwater and recycled water as “vital to their operations.”

The company has reported numerous incidents related to water in the past few years, including flooding, droughts, and regulatory challenges. In 2010, Exxaro reported that 17 out of 30 “Level 2”⁷ environmental incidents were water-related. Half of Level 2 incidents in 2011 were also water-related, primarily caused by flooding and groundwater pollution issues. The total financial impact of all water-related incidents in FY2011 amounted to \$0.55 million (0.1% of \$531 million EBITDA),⁸ while just one reported flooding incident that closed operations for one day in 2014 amounted to over \$2 million in damages.⁹ The “unavailability of water” ranked 6th (out of 20) in Exxaro’s top risks in 2014.¹⁰

Exxaro currently operates 13 facilities in South Africa that are exposed to water risk. With mining operations in water-stressed regions around the country, water is a key strategic resource for Exxaro that has forced them to develop a comprehensive water management strategy.¹¹

Strategy

Exxaro recognizes that water management is critical to the success of their business operations and also an important natural resource for South Africa. The company

⁷ Level 2 - Environmental incidents with reversible on-site and immediate surrounding impacts, will involve more than 48 hours in clean-up activities and a negative impact on shareholder value (eg R50 000 - R500 000 in damage has definitely occurred).

⁸ Metals and Mining Sector Under Water Pressure

⁹ Exxaro Resources CDP Water Report 2014.

¹⁰ Exxaro Integrated Report 2014.

¹¹ Exxaro Resources CDP Water Report 2015.

therefore introduced a water management policy in 2010 that aims to strategically manage water-related risks and optimize water use efficiency.¹²

Overall, Exxaro's main focus in water-related initiatives is increasing the use of recycled water and developing innovative water treatment systems for their operations. As a minimum standard, the company complies with national environmental regulations for water management and voluntary benchmarks outlined by the CDP Water Disclosure Project and the Global Reporting Initiative. In line with the Department of Water Affairs' water resource management guidelines, Exxaro's water policy focuses on pollution prevention, water treatment, maximizing water reuse, and responsible water discharge. Exxaro applies these guidelines to the whole life-cycle of a mine and implements best practices outlined by the Department of Water and Sanitation for storm water management, pollution control dams, water use and reclamation, etc.¹³ Exxaro's water accounting methodology includes measuring water quality and volumes against efficiency and intensity targets, water permit guidelines, and internal benchmarks. The majority of Exxaro's operations now have water conservation plans and the company identified 16 strategic initiatives with five-year targets, as well as long-term goals of becoming self-sufficient in operational water requirements and leading the industry in water technology solutions.¹⁴

Through their water accounting methodology and risk assessment, Exxaro aims to identify and address physical, regulatory, and reputational risks throughout their business units. For example, the company recognized that drought has the potential to reduce output and increase operating costs in business units that rely on rainfall for operational needs. Their response strategy has been to implement water efficiency targets at threatened business units and build dry processing technology and processes into new and existing plants. To address regulatory risks around changing water regulation, Exxaro is engaging with the Department of Water Affairs, industry associations, and local and provincial governments to support policy-makers in developing win-win policies for industry and government. Further, Exxaro is addressing safety risks and water contamination resulting from flooding at underground mines by building three water treatment plants. When completed, the plants will have the capacity to treat 17.5 mega liters of water per day. Exxaro aims to ensure the water they discharge is of the same or better quality than the original input.¹⁵

Further, Exxaro is collaborating with a local university to evaluate innovative passive water treatment systems. As opposed to water treatment plants that require power and regular maintenance, passive systems treat acid mine drainage

¹² Exxaro Resources Integrated Report 2014.

¹³ Exxaro Resources Supplementary Report 2015.

http://www.exxaro.com/ar/2015/Exxaro_2015_Supplementary_Report.pdf

¹⁴ Exxaro Resources Supplementary Report 2015.

http://www.exxaro.com/ar/2015/Exxaro_2015_Supplementary_Report.pdf

¹⁵ Exxaro Resources CDP Water Report 2015.

chemically or biologically and therefore offer inexpensive and (potentially) environmentally responsible long-term solutions to water management. The pilot plant was implemented at the end of 2014 and has shown promising results.¹⁶

Water performance is reported to the Sustainability, Risk, and Compliance Committee quarterly. Through board-level participation and regular monitoring of water use against goals and KPIs, Exxaro has integrated water management into their business strategy. Exxaro also publicly discloses water management information through participation in the CDP and annual integrated reports.¹⁷

Impacts

Exxaro introduced water intensity targets in 2013. Between 2012 and 2013, they reduced water withdrawals 33%, and 14% between 2013 and 2014. They increased water withdrawals by 20% between 2014 and 2015, mainly due to the addition of two new plants. Exxaro achieved their target of 5% savings in absolute potable water withdrawals by 2013 from baseline year 2010.¹⁸ Beyond quantitative measures, Exxaro has worked on watershed remediation and habitat restoration by preserving and reconstructing wetlands near their Matla mine.

Additionally, the wastewater treatment plant at the Matla mine in the Mpumalanga region will treat 10.5 mega liters of water per day; 6.5 of that will be discharged back to the Olifants river for downstream use while the rest will be used for mine operations and potable water needs. Construction of the plant created 200 temporary jobs and will have 14 permanent jobs once completed.¹⁹

Exxaro's sustainability strategy has earned the company accolades, including the Nkonki Top 100 Integrated Reporting Award in 2014, the top 10 EY Excellence in Integrated Reporting 2014, the RobecoSAM 2015 Sustainability Yearbook bronze medal, ranking as the number one mining company in the Top Employers Institute and inclusion in the JSE's Social Responsibility Index. Lastly, the Boston Consulting Group named Exxaro one of the top ten global mining companies to deliver the highest shareholder returns between 2001 and 2011.²⁰

Lessons Learned

Since 2010, Exxaro Resources has taken a proactive approach to water stewardship by measuring, mitigating, and disclosing water-related information. After experiencing numerous, costly water related incidents, Exxaro performed a thorough water accounting and risk assessment that calculated the financial impact

¹⁶ Exxaro Integrated Report 2014.

¹⁷ Exxaro Resources Supplementary Report 2015.

http://www.exxaro.com/ar/2015/Exxaro_2015_Supplementary_Report.pdf

¹⁸ Exxaro Integrated Report 2014.

¹⁹ Exxaro Resources. Exxaro Water Treatment Plant Set to Improve Safety, Benefit the Environment and Local Water Users. <http://www.exxaro.com/index.php/new-r250m-exxaro-water-treatment-plant-set-to-improve-safety-benefit-the-environment-and-local-water-users/>

²⁰ Financial Mail. 2014. Nkonki Integrated Reporting Awards. http://www.nkonki.com/images/integrated-reporting/FM_Nkonki_Integrated_Reporting_Awards_15_Aug_2014.pdf

of water risk throughout their global mining operations. Measuring risk informed them that a holistic approach with board-level participation was necessary. Exxaro has met or is on track to meet water reduction targets by implementing strategies to decrease withdrawal and increase reuse and recycling, though the reductions are relatively small to date and much of the work is in progress and thus it is too early to assess the full impact.

The relatively small percentage reduction to date may be partially attributed to placing more weight on processes rather than implementation of water risk management. In a case study by SAP and APQC, Exxaro's Manager of Risk and Compliance recognized that, "we're very good at identifying and logging risk, [but] I think our next challenge is to make people realize that it's more important to manage it than to log it."²¹

Mining companies increasingly face water-related risks, however few have demonstrated successful, comprehensive strategies to address these challenges across their operations. While voluntary reporting should increase transparency and accountability, the discrepancy in reported data across platforms makes it difficult to fully measure and assess the outcomes of corporate water strategies. Lastly, while desalination and conservation technologies may reduce some of the risk of operating in water-scarce regions, water quality and adequate water treatment in communities may pose the biggest threat to companies' license to operate in the future.

Case Questions:

If you were CEO of the company:

- a. What additional steps can you take to decrease water use? Should you be changing your acquisition and/or new plant strategy based on water risk?
- b. Are there any other steps you should consider to ensure the long-term viability of the company given that it competes in a water stressed industry?

If you were the following stakeholders, what questions would you be asking to assess the company's water risk?

- a. an insurance company being asked to insure an existing site and a new site. (Do you evaluate the sites differently?)

²¹ APQC. ERM at Exxaro Resources Ltd. http://www.sap.com/bin/sapcom/en_za/downloadasset.2014-07-jul-11-01.enterprise-risk-management-at-exxaro-resources-pdf.html

- b. a private equity firm assessing an equity position in the company, with a long-term holding philosophy. What are the long-term and short-term financial prospects of the company, factoring in water risk?
- c. a banker being asked to extend a line of credit.

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