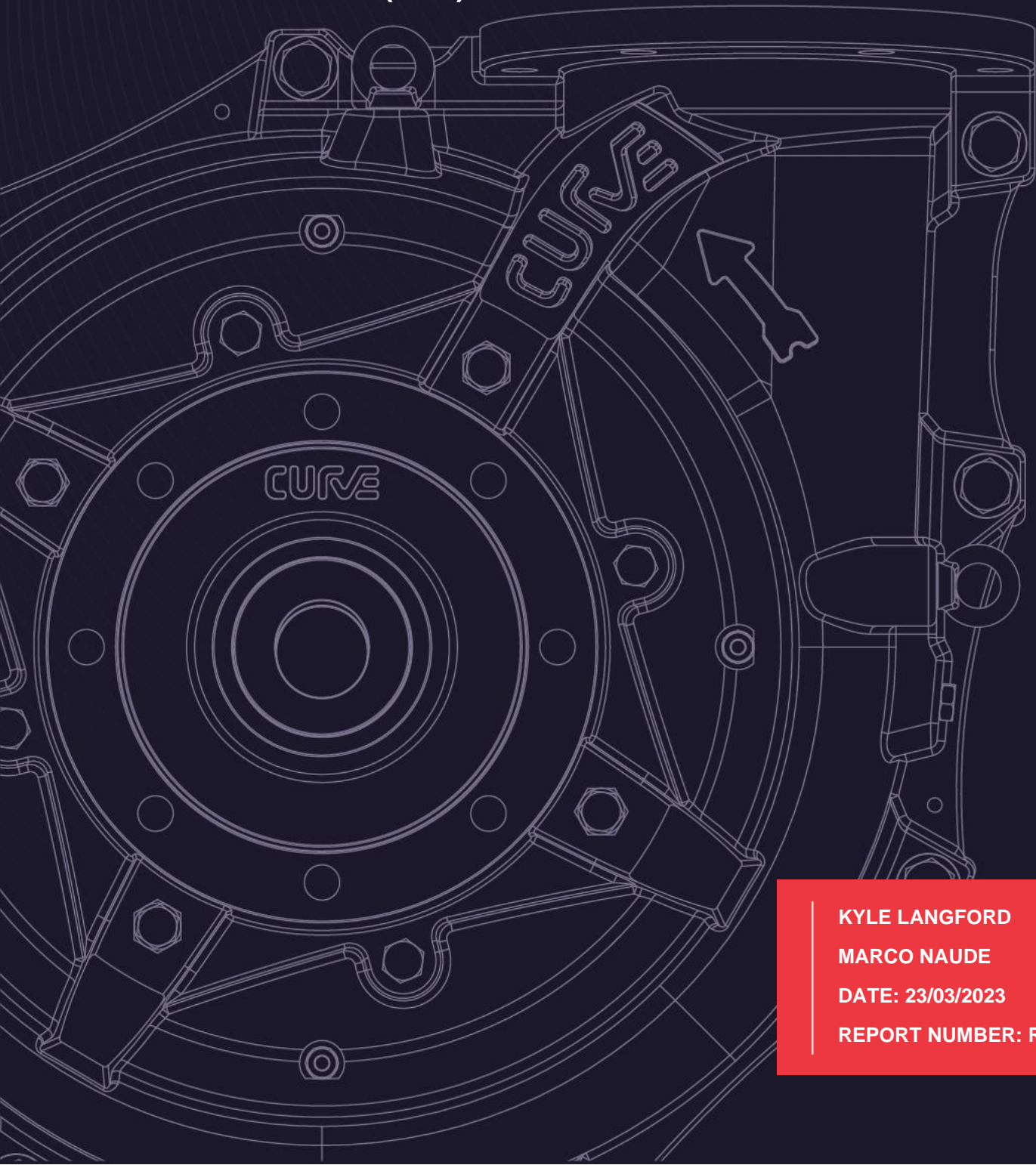


CURVE

**ULTRA HIGH DENSE MEDIA SEPARATION
PLANT (UHDMS)**

CONSULMET PTY (LTD)

Pump System Specialists



KYLE LANGFORD

MARCO NAUDE

DATE: 23/03/2023

REPORT NUMBER: REP032023-004

PROJECT OVERVIEW

Consulmet procured a range of slurry pumps from Pump & Abrasion Technologies® as part of their Iron Ore Ultra High Dense Media Separation Plant project for Gravmax in Thabazimbi. Pump & Abrasion Technologies® were provided with the opportunity to supply the complete range of water and slurry pumps for the project.

The table below summarises the applications of the pumps installed:

IRON ORE DMS PROJECT – PUMP SCHEDULE			
TAG NUMBER	APPLICATION NAME	PUMP SIZE	MOTOR SIZE
GRA-A200-PMP-001	CYCLONE FEED	C200	220kW
GRA-A200-PMP-002	CORRECT MEDIUM	C200	160kW
GRA-A200-PMP-005	DILUTE MEDIUM	C200	55kW
GRA-A200-PMP-003	PRIMARY DENSIFIER FEED	S150	75kW
GRA-A200-PMP-004	SECONDARY DENSIFIER FEED	S150	160kW
GRA-A200-PMP-006	DEGRIT CYCLONE FEED	S150	22kW
GRA-A200-PMP-007	DMS EFFLUENT	S200	30kW
GRA-A200-PMP-008	DMS SPILLAGE	VS50	11kW

Table 1 - Iron Ore Ultra High Dense Media Separation Pump Schedule

Further details on the project below:

- Order Placement Date: 26 November 2021
- Lead Time Quoted: 12-14 working weeks.
- Delivery dates: 18 February 2022 – 4 March 2022
- Plant Start-up on product: 30 September 2022



Figure 1 – Consulmet Iron Ore Ultra High Dense Media Separation Plant

CYCLONE FEED PUMP

A similar Dense Media Separation Plant at Sishen Iron Ore. The cyclone feed pump, from another supplier, on that plant lasted between two and three weeks before requiring maintenance and a full pump overhaul.

The image below depicts the cyclone feed pump installed at the Ultra High Dense Media Separation Plant installed by Consulmet at the Gravmax plant in Thabazimbi.



Figure 2 - Cyclone Feed Pump

The figure below displays the performance of the CURVE™ C200:

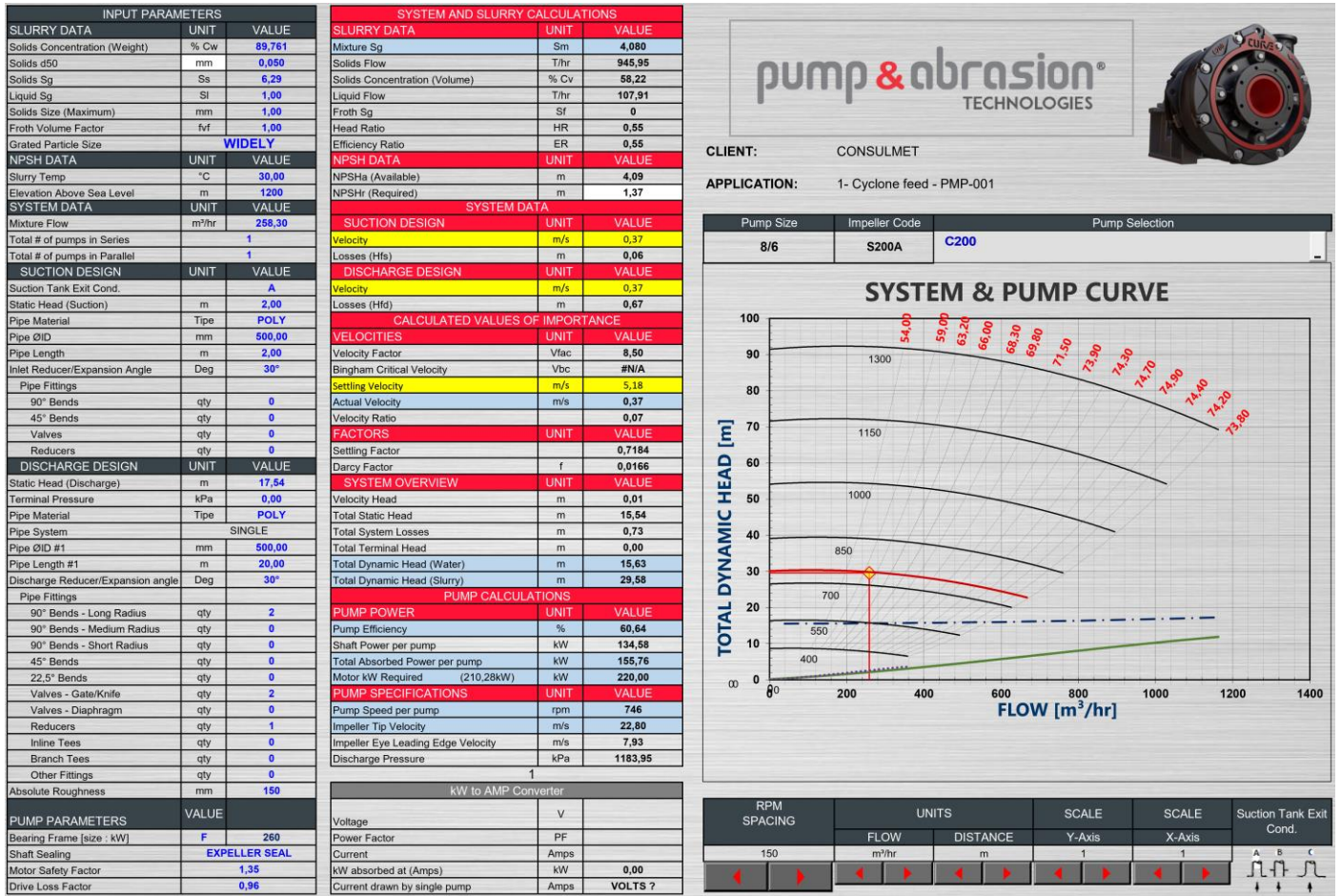


Figure 3 – Pump Performance Curve

The performance curve above highlights the following performance characteristics.

PERFORMANCE PARAMETERS	
PERFORMANCE PARAMETER	VALUE
Flow Rate	258.30 m³/hr
Power Absorbed	155.76 kW
Motor Size Required	220 kW
Pump Speed	746 RPM
Pump Efficiency	60.64%
Impeller Tip Velocity	22.80 m/s

Table 2 – Performance Parameters

INSPECTION – 14 WEEKS IN OPERATION

After approximately **6 weeks**, the pump was opened for inspection, and then again after **14 weeks**, the cyclone feed pump was opened to inspect the wear of the pump due to concerns of the wear life based on the similar installation at Sishen Iron Ore. The pictures below indicate the condition of the wear parts on the 14-week inspection:



Figure 4 - Cyclone Feed Pump Suction and Drive Liner

The suction liner has a clean, uniform, groove-like wear pattern. The sealing edge between the casing and suction liner is completely intact and unworn. There was little to no change in the wear from the first inspection to the second. The deep groove-like wear can be accounted for by the oversize particles that enter the pump from the primary screen, which get trapped between the suction liner and impeller in the pump out vanes where they gouge into the impeller and suction liner, the same pattern can be seen on the drive liner and the impeller. The wear on the suction liner is relatively uniform across the complete surface of the suction liner and therefore the complete wear surface of the liner can be used.



Figure 5 - Impeller wear

Minimal impeller wear is visible, the shrouds have not lost much thickness. The primary vane tips are in good condition but have some minor wear. The impeller eye is unworn and there is no sign of the impeller vanes thinning.



Figure 6 - Casing and Cut Water Wear

The volute/casing shows minimal signs of wear and is still in very good condition.



Figure 7 - Flow Corrector Wear

The above image highlights the wear on the Flow Corrector™. The wear is negligible as the only wear present is the polyurethane coating peeling off the chrome cross. The Flow Corrector™ has performed excellently, this is evident in the way the eye of the impeller has no wear.

WEAR LIFE PREDICTION

Based on the visual inspection of the wear on the individual parts, Pump & Abrasion Technologies® would make the following wear life prediction:

WEAR LIFE PREDICTION	
COMPONENT	WEAR LIFE
IMPELLER	30 WEEKS
CASING	30 WEEKS
SUCTION LINER	20 WEEKS
DRIVE LINER	20 WEEKS

Table 3 - Component Wear Life Prediction

The Above prediction results in an average component wear life of **25 Weeks**. The below figure represents the comparative wear life of the Sishen and the newly completed plant.

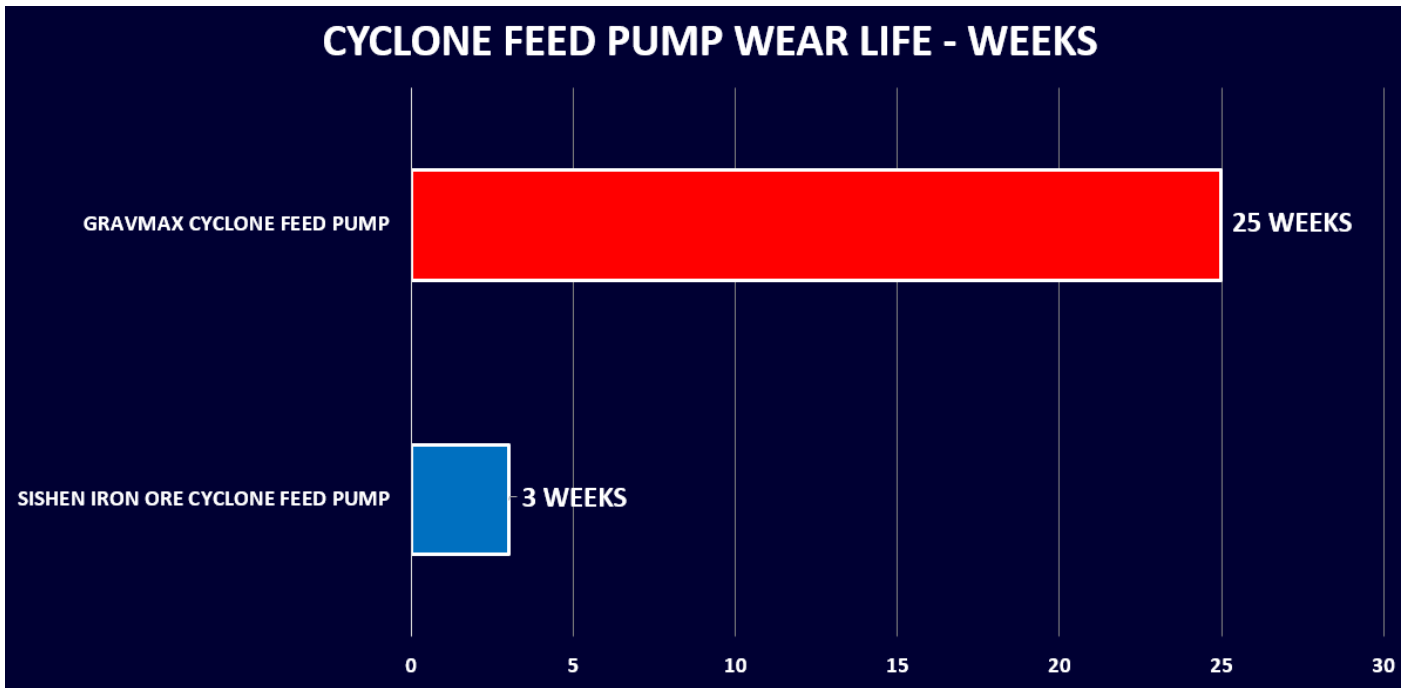


Figure 8 - Comparative Wear Life

When Put To The Test, A Curve Slurry Pump Outperforms And Outlasts Any Other Slurry Pump On The Market.

We are a focused OEM, providing our customers with innovative pump system solutions & products that reduce the impact & extend the life of slurry pumps.



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PUMP AND ABRASION TECHNOLOGIES

Our Global Presence:

From east-coast of Australia to the west-coast of America, we have pump system specialists across the globe available to support your operation.

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