



Orboast Gas Processing Plant

Phase 2B works presentation¹

19 August 2021



1. The information set out in this presentation regarding the Orboast Gas Processing Plant has been prepared by Cooper Energy

Key messages

Extensive testing provides confidence in Phase 2B works to significantly improve plant performance

- Understanding of the Orbost Gas Processing Plant (OGPP) has greatly improved throughout 2021
- Recent performance and average gas processing rates have improved:
 - H1 FY21: 23 TJ/day
 - H2 FY21: 35 TJ/day
 - Since 1 July 2021: 40 TJ/day
- Absorbers proven to operate at 34 TJ/day (each) when clean
- Key to improving stability and rates is reducing foaming and solids accumulation (fouling)
- Phase 2B works primarily targeting a reduction in fouling
- Numerous trials conducted to define most suitable technology application
- Independently, the root cause analysis is continuing

Snapshot of Phase 2B works

Phase 2B approved by Cooper Energy will complete works agreed under the Transition Agreement

- Phase 2 works were agreed in accordance with the Transition Agreement signed with APA in 2020¹
 - Phase 2A involved reconfiguration of absorbers to enable parallel and / or independent operations²
 - Phase 2B activities will complete the scope of works as per the Transition Agreement



PHASE 2B SCOPE

1. Installation of **solids removal** technology to prevent fouling within the absorbers
2. Installation of **spray nozzles** in absorbers to suppress foaming and reduce fouling



TIMING

- End Q1 FY22: Spray nozzle installation
- Q3 FY22: Solids removal installation



COST

- Estimated to cost \$20 million (100%); to be shared equally with APA
- Cooper Energy share expected to be largely funded from escrow account (minimal impact on cash reserves)



OBJECTIVES

- Improve plant stability and performance
- Extend absorber clean cycles

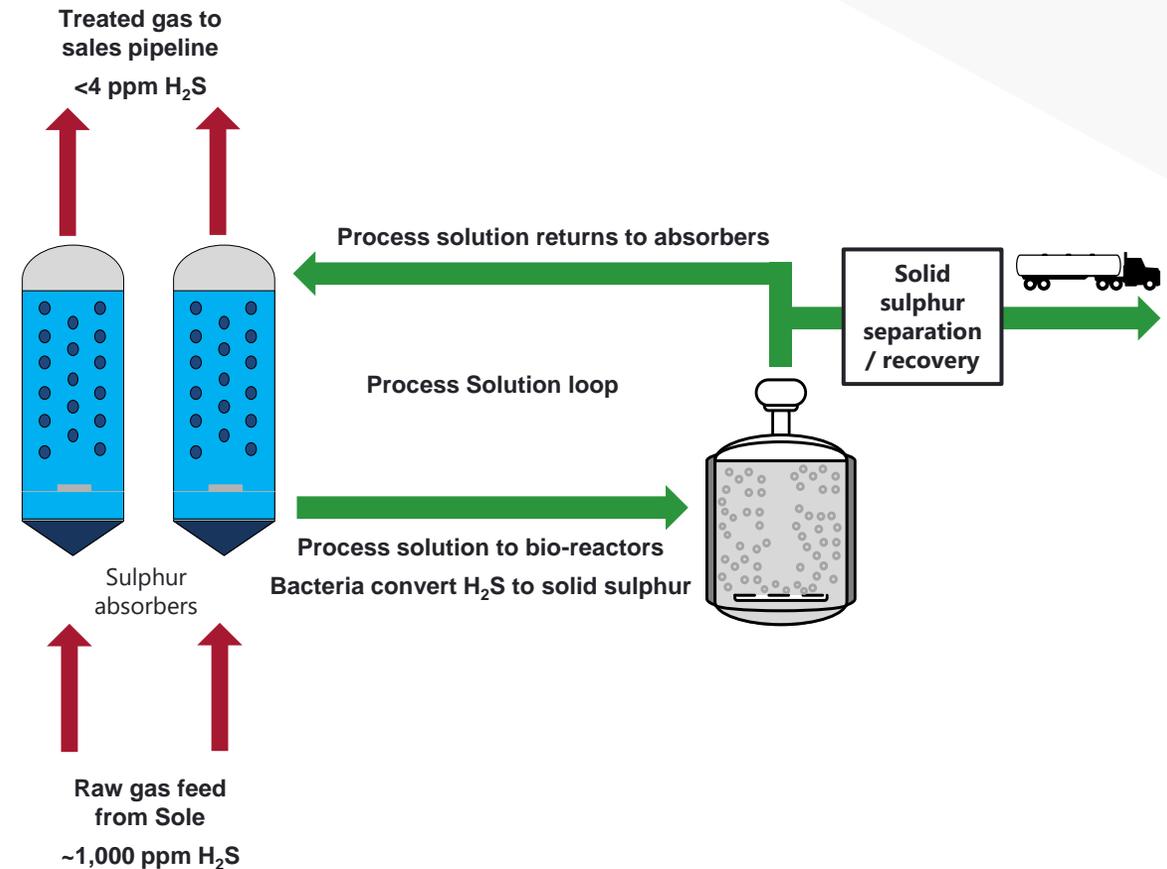
1. For further information, refer to ASX presentation of 15 February 2021

2. For further information, refer to ASX announcement of 9 December 2020

A recap: extracting H₂S from Sole raw gas

Process utilises technology under licence from Shell

- Sole gas contains H₂S (~1,000 ppm¹) which requires extraction
- Technology uses naturally occurring bacteria to convert H₂S into solid sulphur
- Bacteria lives in the process solution which circulates in a closed loop between the absorbers and bio-reactors
- The absorbers operate at high pressure to absorb H₂S from the raw gas into the solution
- The solution then passes into the bio-reactors where the bacteria converts the absorbed sulphur into solid sulphur
- A slip stream is taken off the loop to remove the solid sulphur from the solution
- The solution returns to the absorbers where the process is repeated

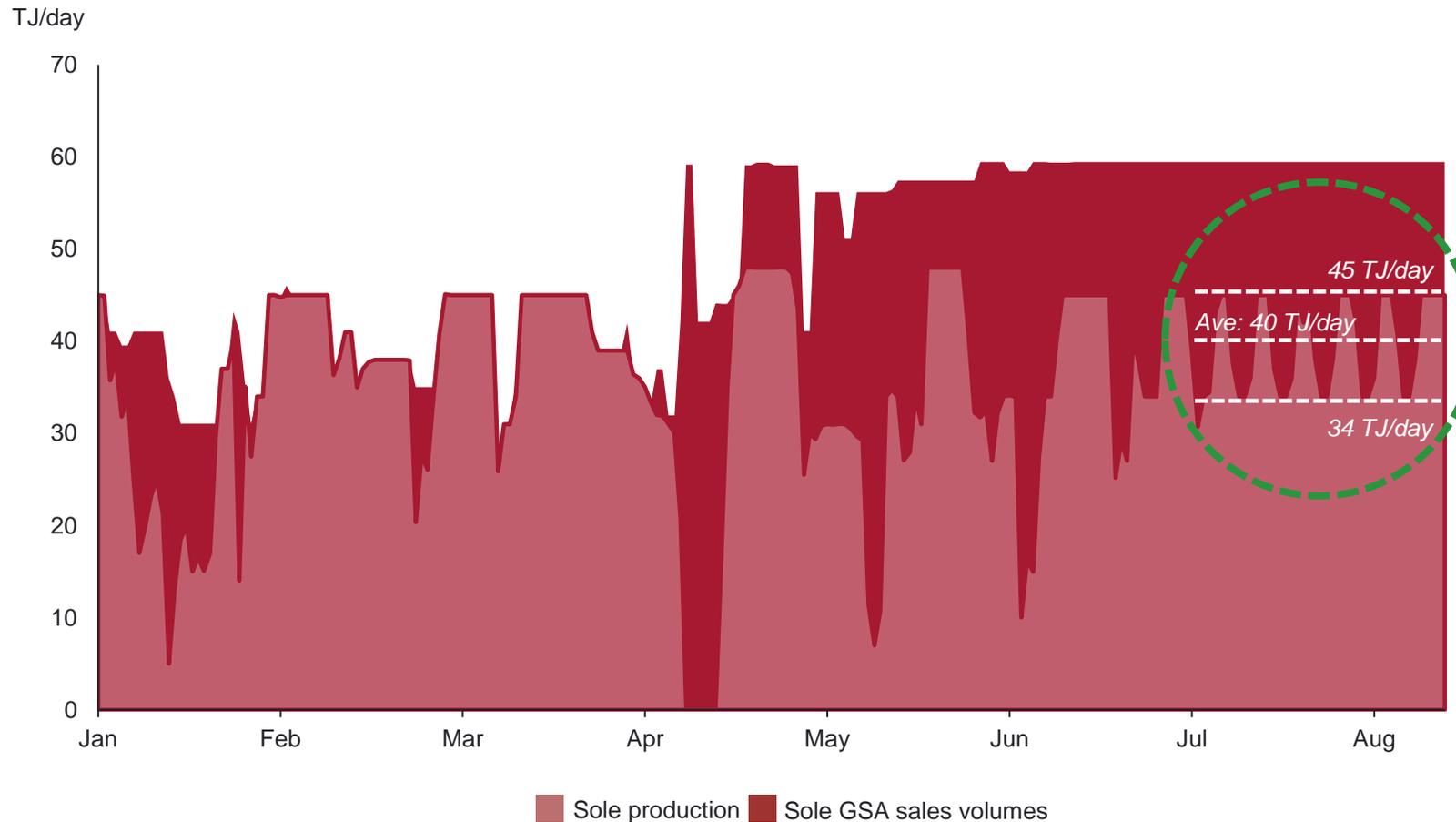


1. ppm = parts per million

The objective: keep absorbers clean to optimise performance

Each absorber proven to operate at 34 TJ/day when clean

OGPP processing rates and Sole GSA volumes: 1 January 2021 to 18 August 2021

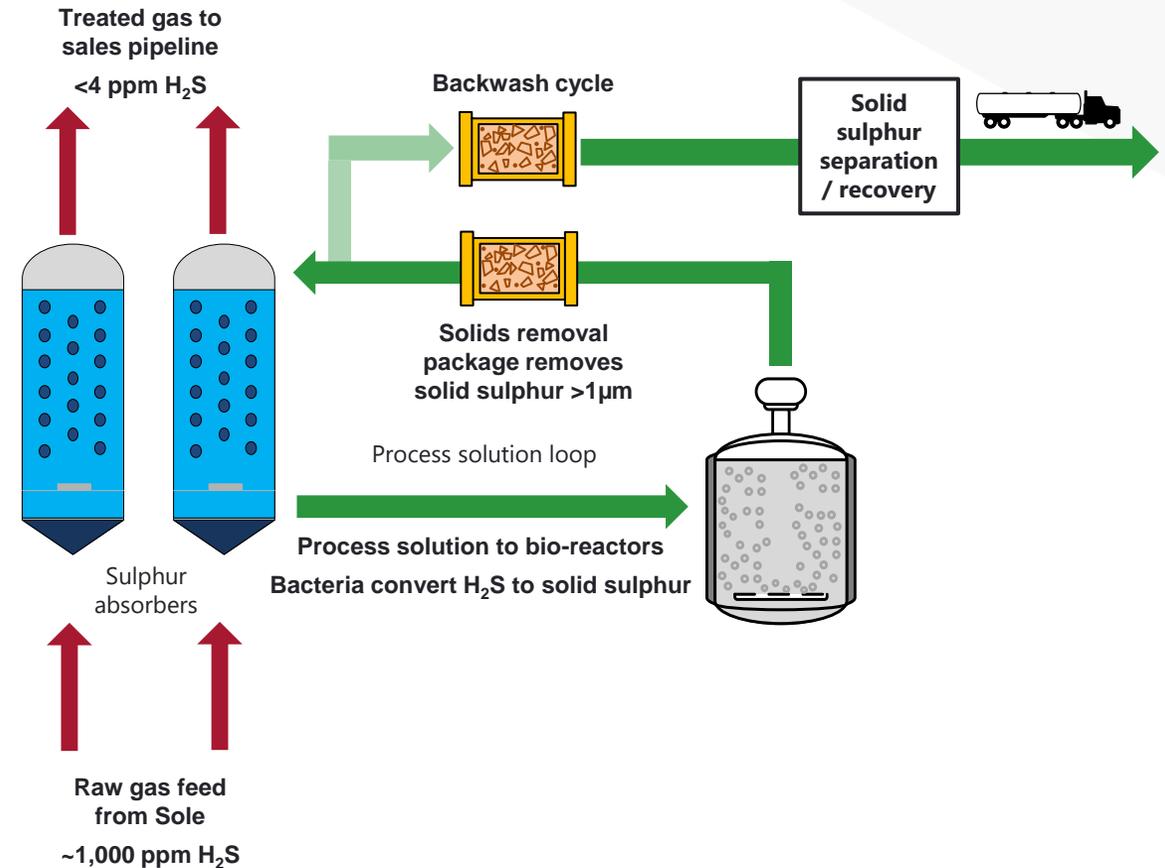


Cleaning of each absorber every two weeks
(i.e. one absorber cleaned every week)
Average processing rate of 40 TJ/day since
1 July 2021

Phase 2B filters: solids removal package

Designed to remove sulphur solids before solution re-enters the absorbers

- The package consists of multiple individual filter cartridges that cycle between filter mode and backwash mode
- Designed to remove solid sulphur of size $>1\mu\text{m}^1$ (based on testing)
- Solid sulphur is removed from the solution before it re-enters the absorbers
- Reverse flow backwashes the cartridges after each cycle with filtered process solution and diffused air
- Over 12,000 litres of OGPP solution filtered through a single cartridge on test with no performance loss witnessed
- Testing indicates solids removal package could significantly extend the time between absorber cleans and potentially eliminate cleans (outside of annual shutdowns)

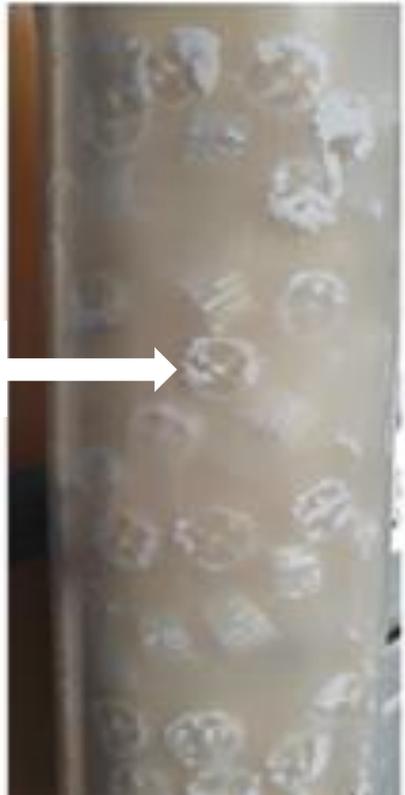


1. $1\mu\text{m}$ = 1 thousandth of a millimetre

Phase 2B filters: successful trials at OGPP

Absorber simulations confirm ability to remove solids

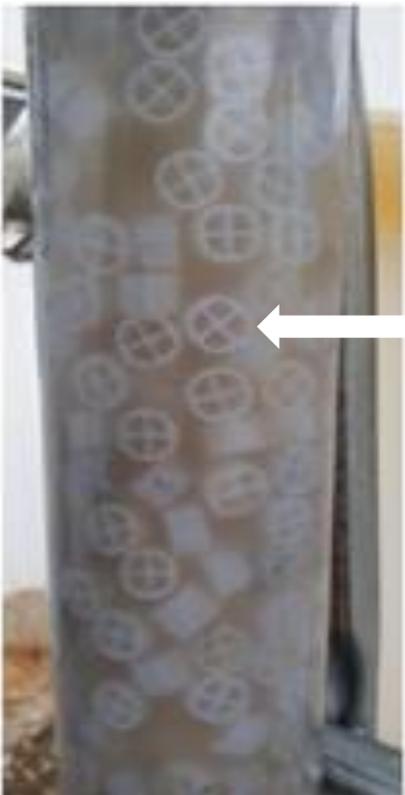
Fouling of absorber packing with unfiltered solution



Solid sulphur build-up on packing



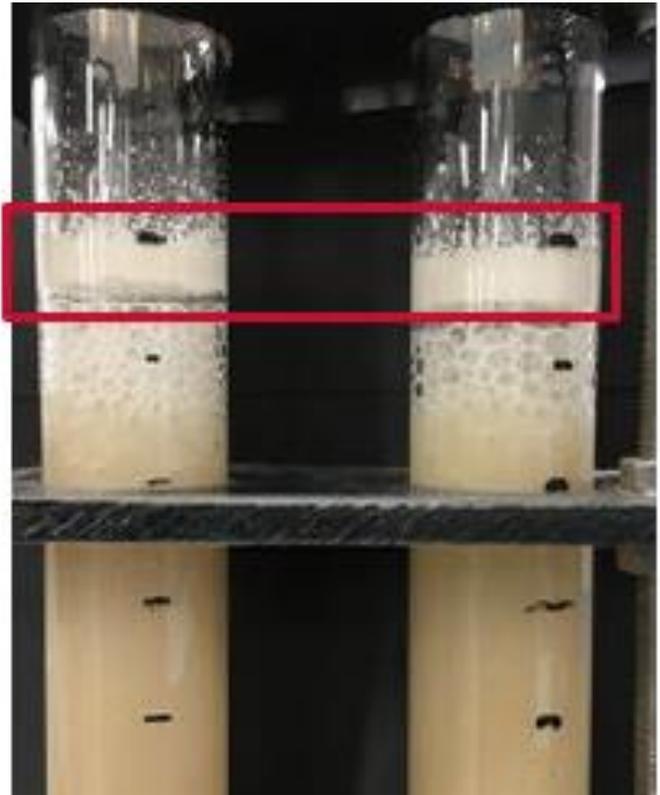
Absorber packing with filtered solution



Packing clear of solid sulphur



Foaming simulation using existing OGPP process solution¹

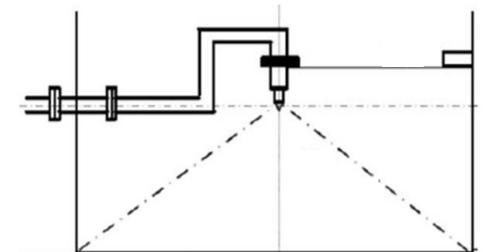
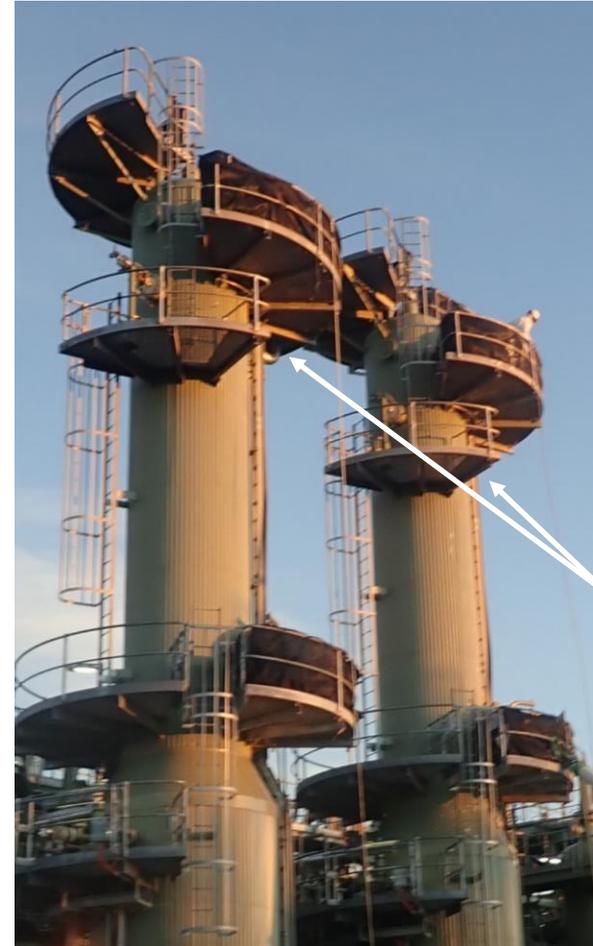


1. Simulation selected from many bubble tests performed to date; not all bubble tests produce foam as depicted

Phase 2B spray nozzles

Designed to reduce foaming within the absorbers which may reduce fouling

- Process solution sprayed through nozzles at the top of each absorber.
- Spray expected to suppress foaming within the absorbers and may also have a positive effect on fouling
- Sulphur particles have been found in the foam at OGPP
- Spray action may also break down sulphur aggregation which may reduce fouling
- Spray nozzle in the first absorber to be installed in August 2021



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Approved and authorised for release by David Maxwell, Managing Director, Cooper Energy Limited.

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