



Thermal Treatment of Vacuum Residue Using Delayed Coking

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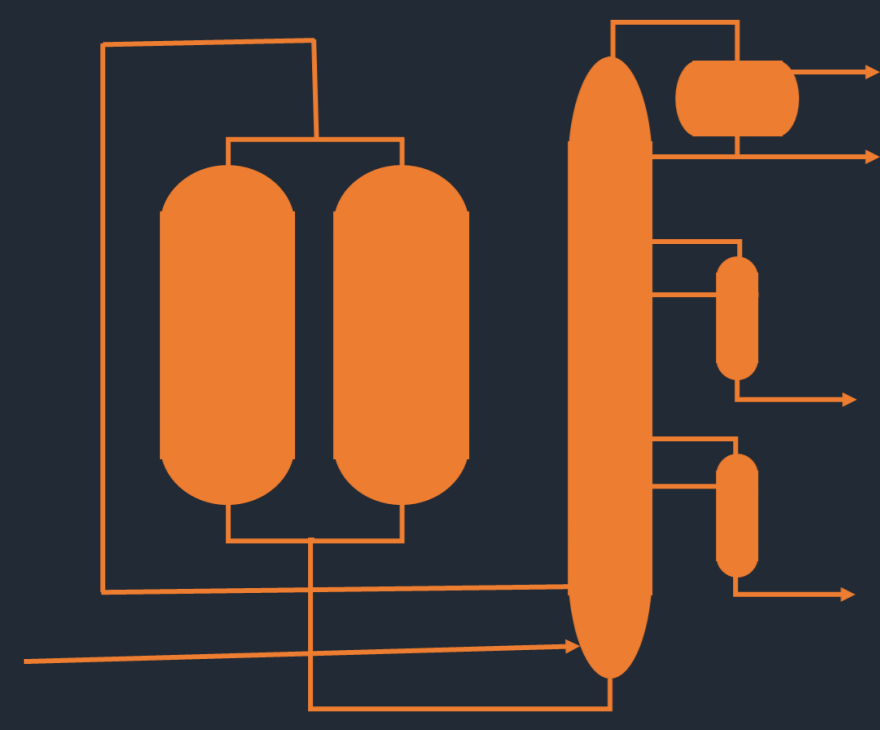
Location
Athabasca oil sands in Northeastern Alberta



Capacity
2,300 barrels/day of Naphtha based on a 30,000 barrels/day VRC



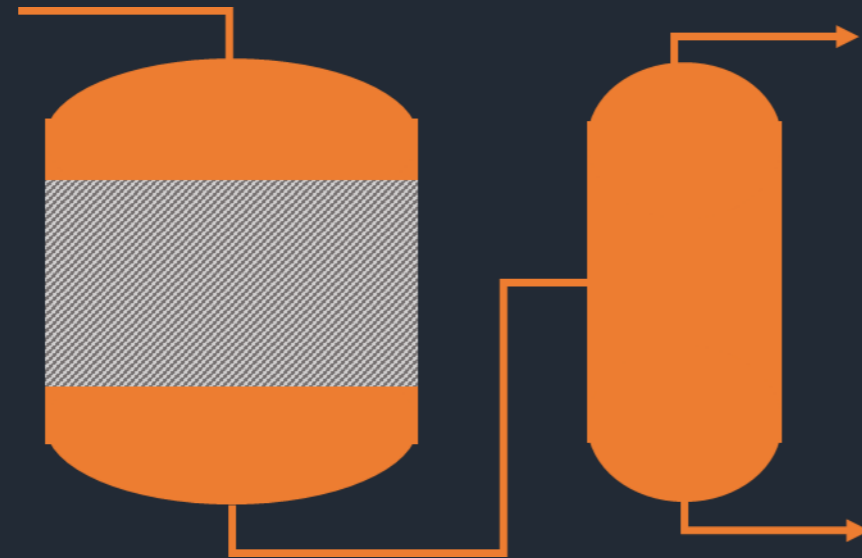
Innovation
Amine Absorber-Regenerator System for Hydrogen Recovery



Delayed Coking

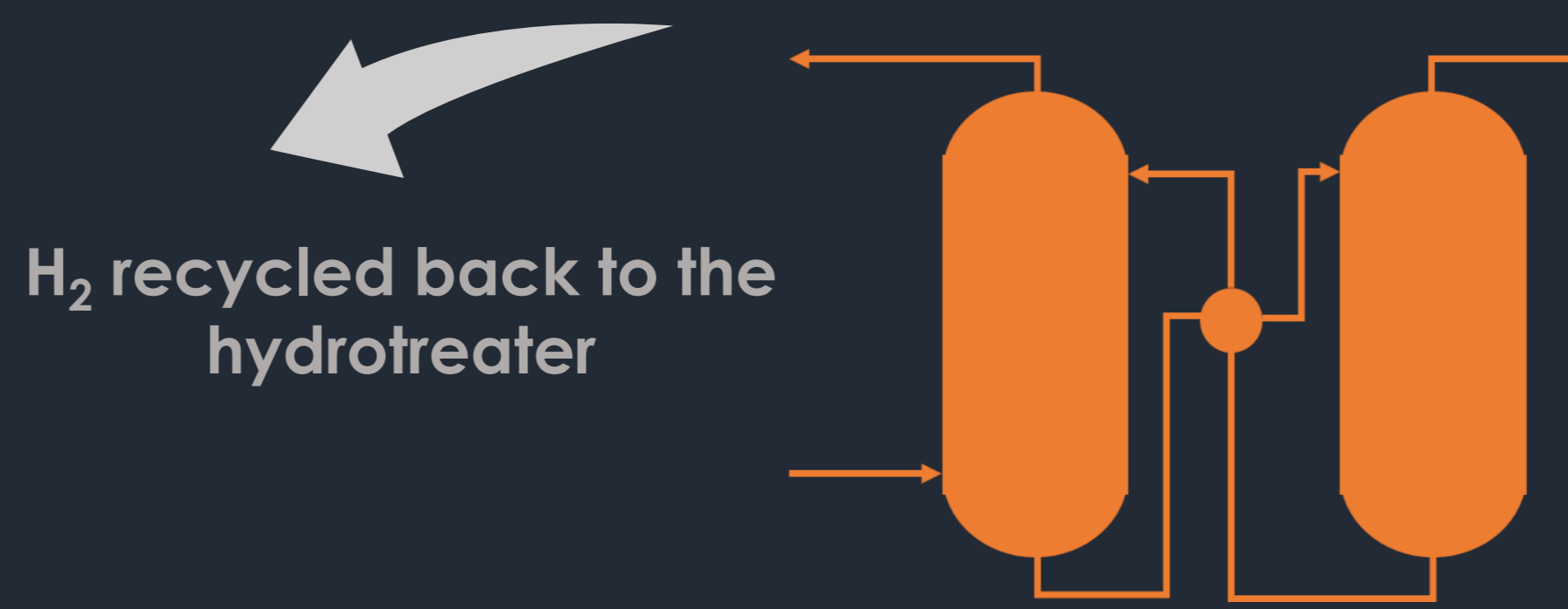
- 2 Coke Drums and a Fractionator
- Main Products:
 - Naphtha
 - Gas Oils

The Process



Naphtha Hydrotreating

- Naphtha processed using H₂ to remove Sulphur impurities
- Naphtha separated from Light Gases (H₂S rich)

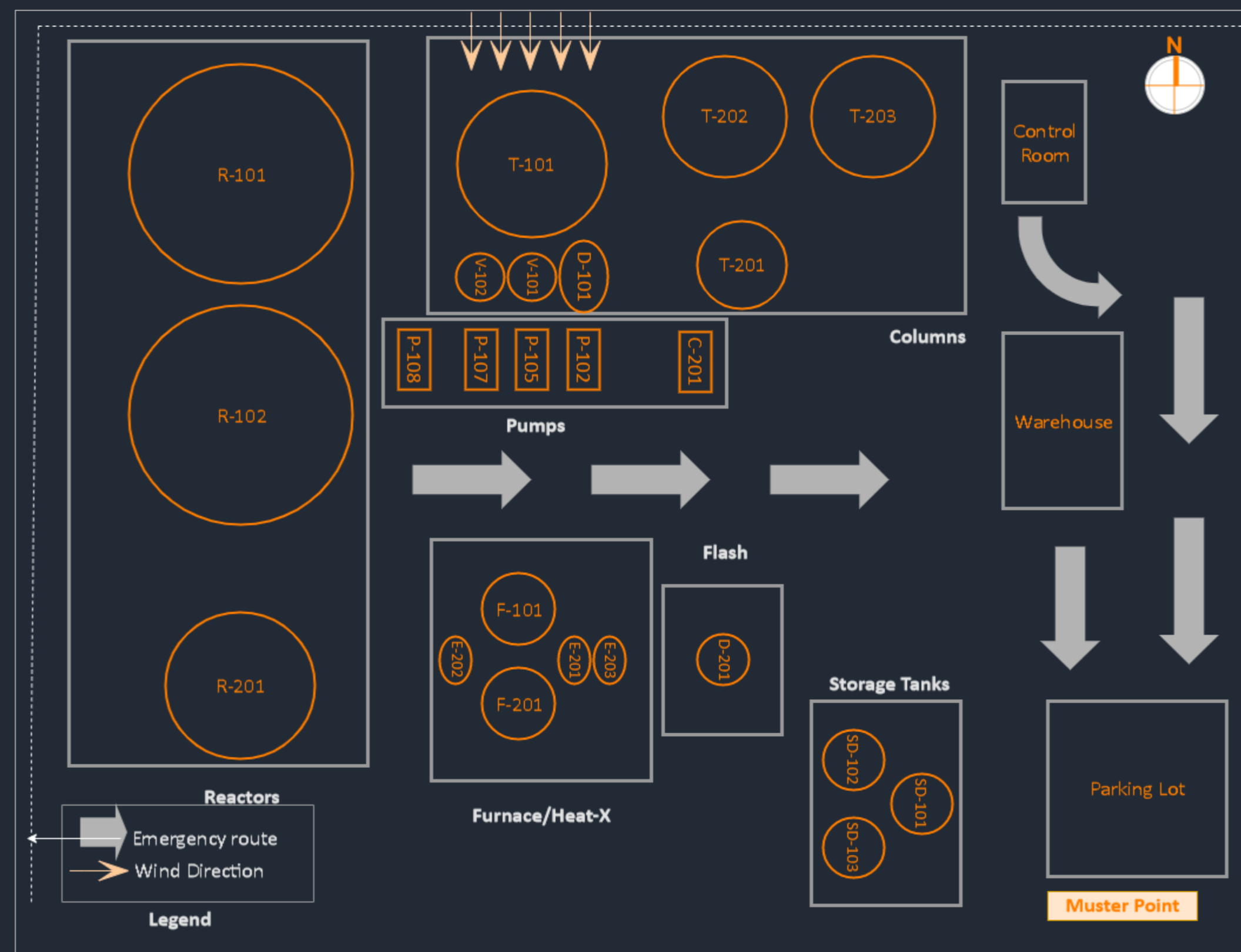


Amine Absorber-Regenerator

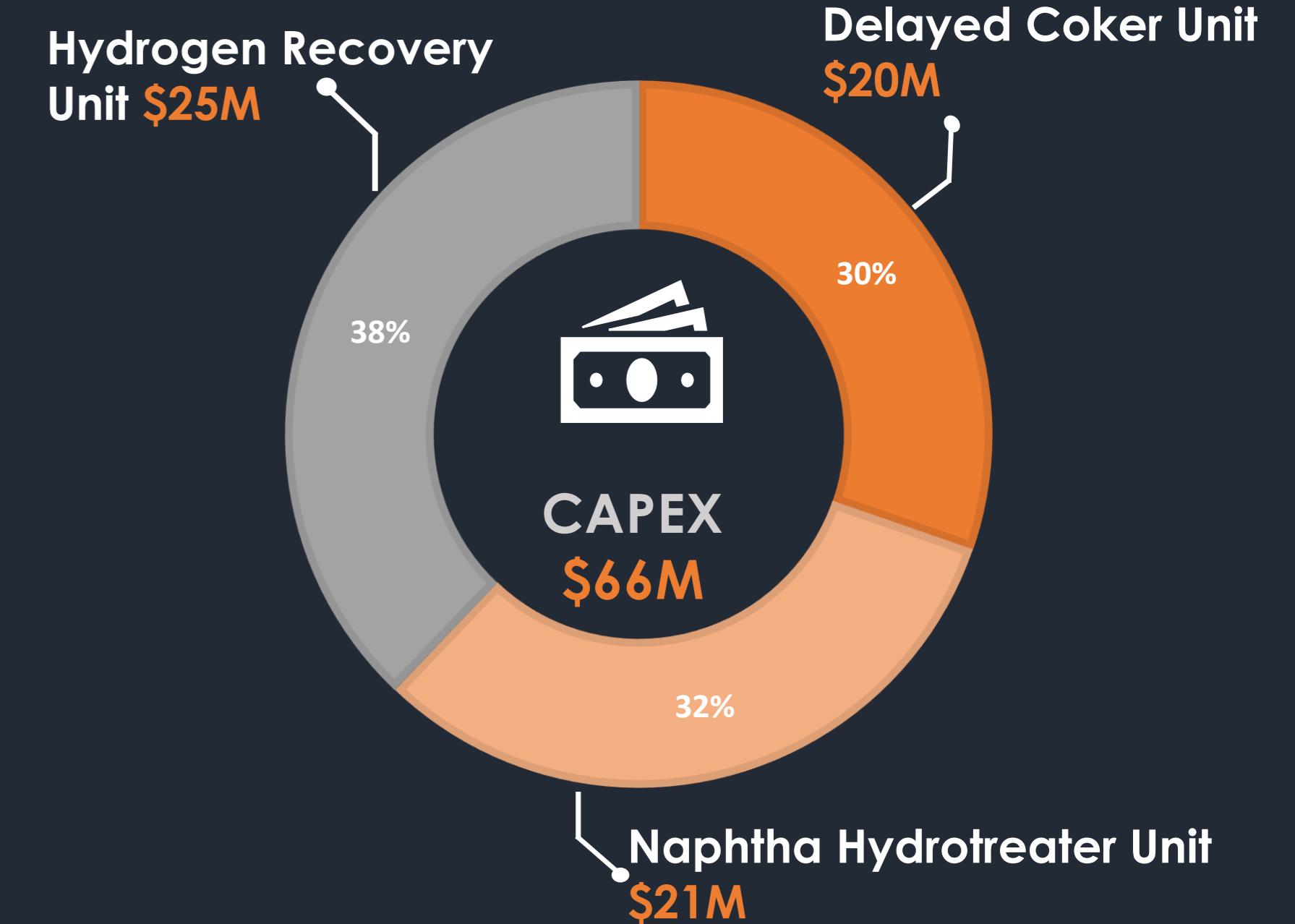
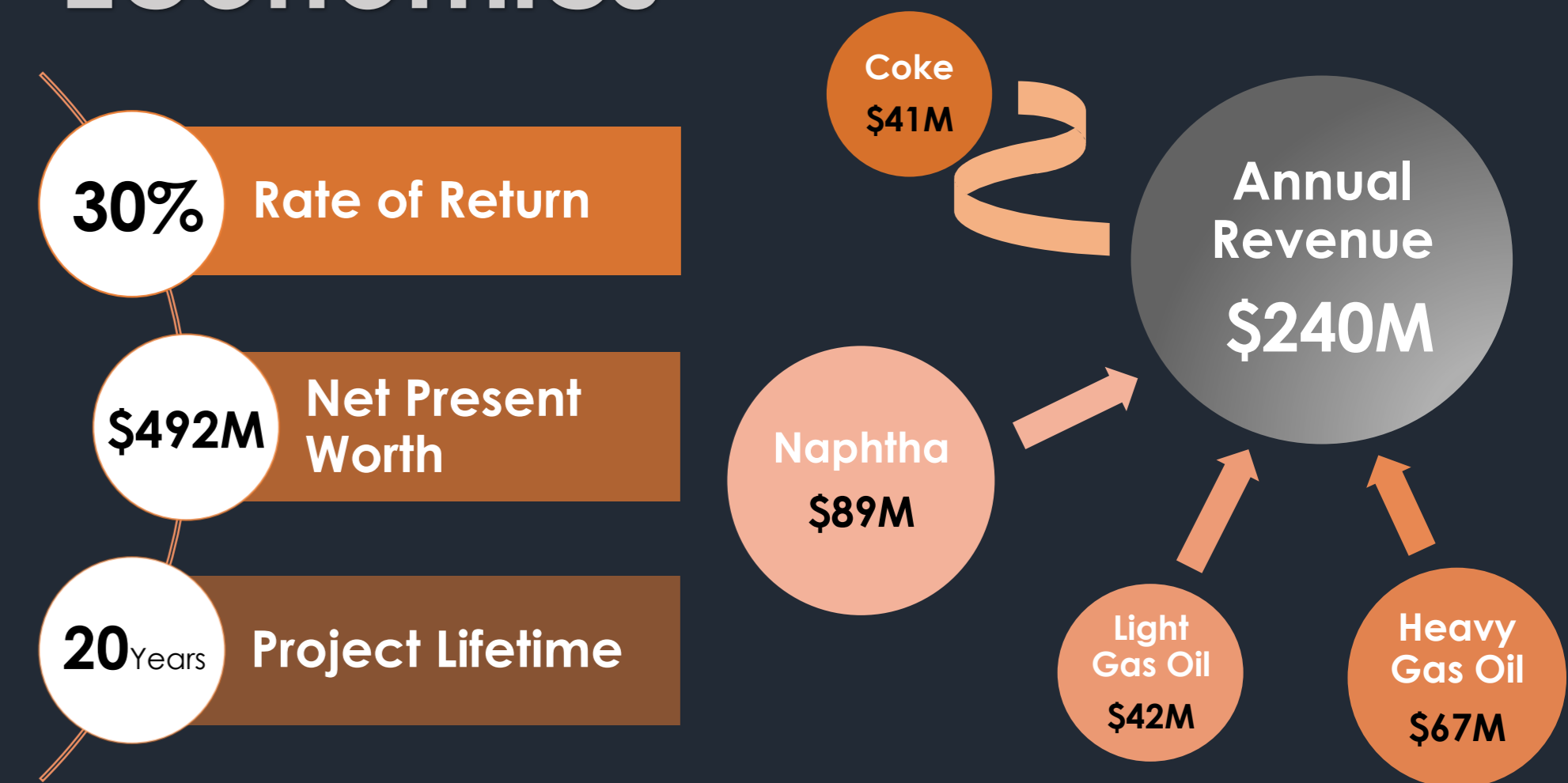
- H₂S removed from Light Gases using Amine

H₂ recycled back to the hydrotreater

Plant Layout



Economics



Environmental Impact

Air Quality

- H₂ Recovery Unit → Vent gas
- Furnaces → Flue gas
- Fractionator → Wet gases

Wastewater

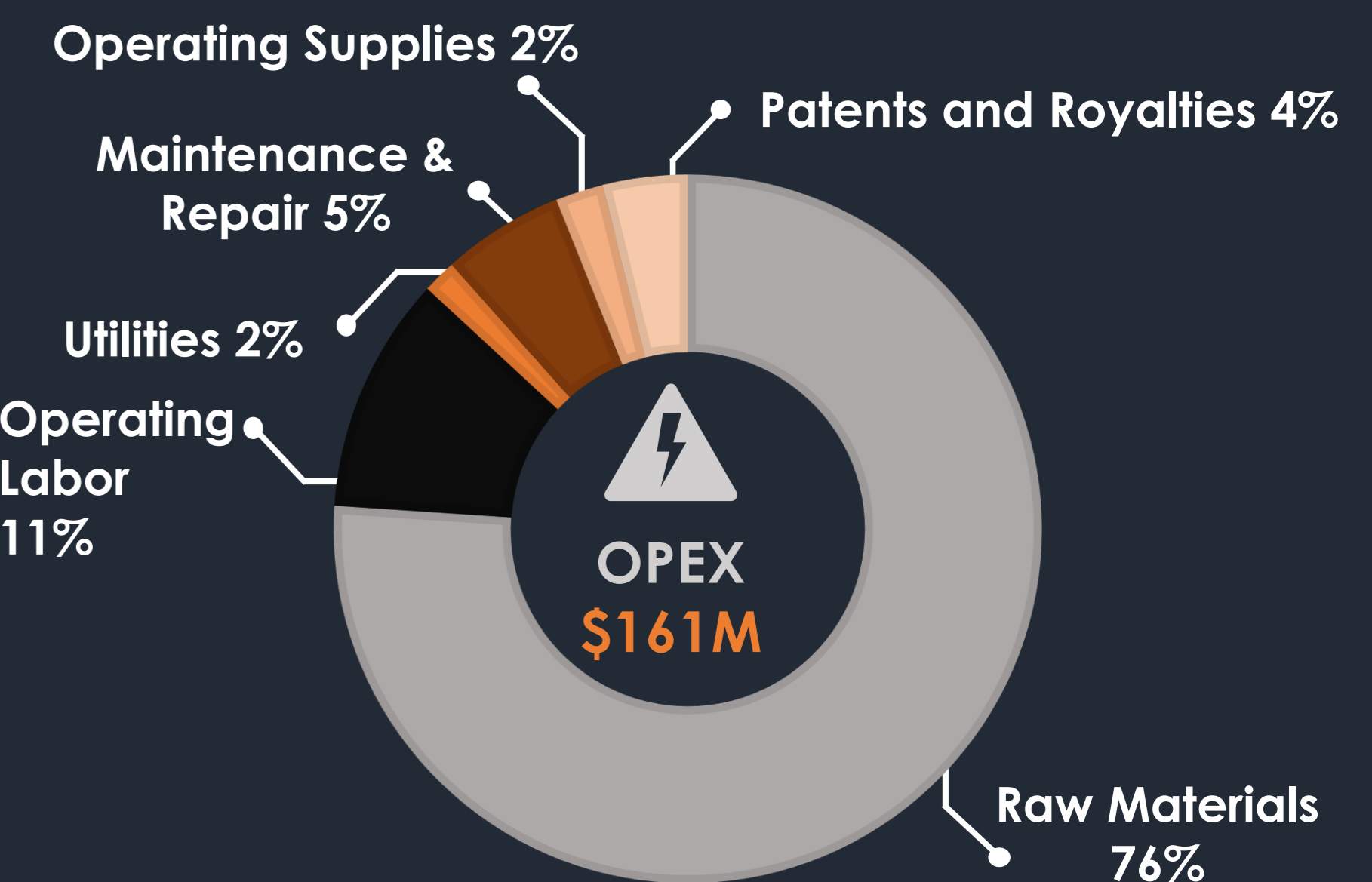
- Sulfide = 14wt% → Sour Water Stripping
- Treated water → recycled as Make-up Water

Sulfur

- H₂S Rich Stream from Regenerator → Sour Water Stripping System and Sulfur Recovery Unit

Greenhouse Gas

- Average = 17000 tonne of CO₂/yr
- Coker Fractionator Wet Gases CO₂ = 0.25 wt%
- Furnace Flue Gas CO₂ = 13 wt%



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