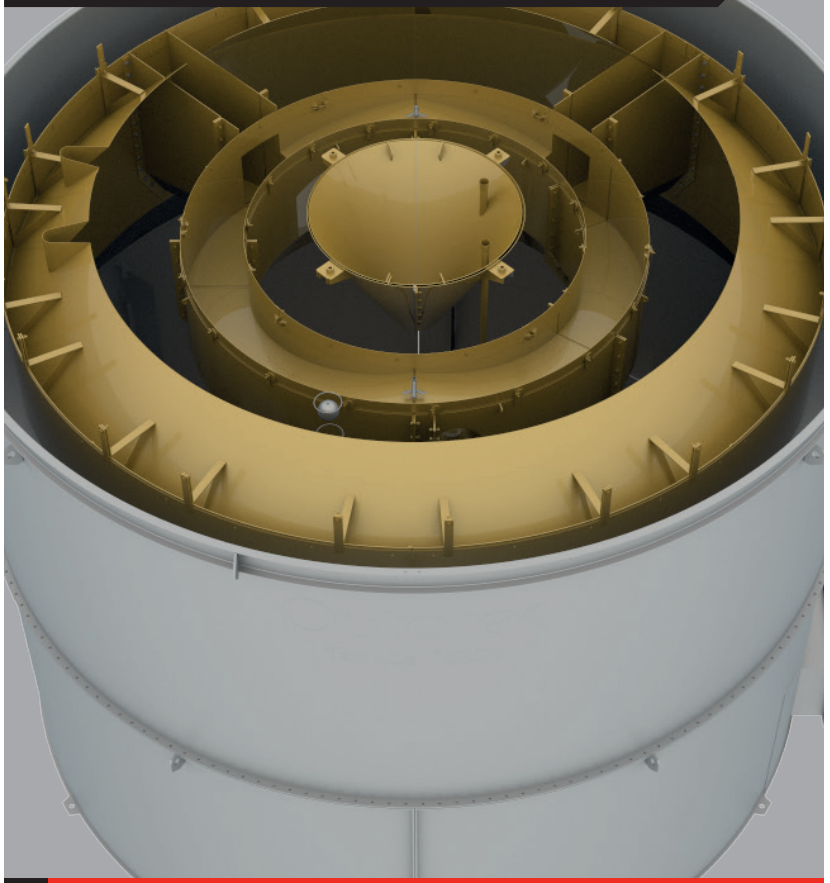
Metso:Outotec

Center launder upgrade

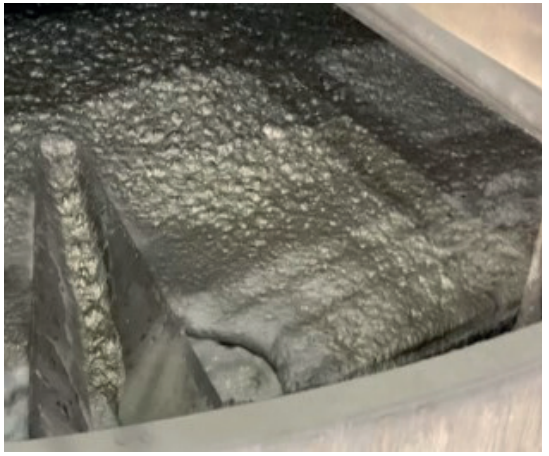
Recovery increase at Kennecott concentrator



Flotation

Improved metallurgical performance and optimized flotation operational parameters with a Metso Outotec flotation center launder upgrade.

A recovery increase of 0.74% Cu and 0.82% Mo was achieved after the installation of a simple upgrade solution



Before upgrade

After upgrade

The Kennecott Copperton concentrator is a 150 ktpd Copper-Molybdenum operation located just outside Salt Lake City, Utah. The rougher scavenger circuit consists of four rows of five Metso Outotec TankCell®300 each. The first two cells operate as roughers and the latter three as scavengers.

Challenge

After the commissioning of the new flotation circuit, coarse particle flotation response on the large forced air cells was not optimal compared to the smaller cells. This was attributed to the larger froth zone characteristics on the bigger cells.

Solution

A site assessment was recommended to evaluate possible solutions. Metso Outotec recommended an upgrade of the radial froth launders in the scavenger TC-300 tank cells to center launders based on the findings of the assessment.
The objective was to increase froth collection rate by drastically reducing the froth surface area (FSA) by 38% and the froth transport distance (FTD) by 71% to optimize the froth zone.

These changes would have a positive impact on the flotation circuit's metallurgical efficiency.

Radial launder (Before upgrade)		Center launder (After upgrade)	
FSA (m^3)	FTD (m)	FSA (m^3)	FTD (m)
37.3	2.9	23.3	0.85

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The set of three center launder packages was installed at the end of rougher row 8 in October 2020, allowing for a three-month metallurgical evaluation of row 8 relative to parallel row 7 with non-upgraded cells. For the study, a baseline period before any upgrade was included. Individual row recoveries were calculated using the 12-hours shift data composite collected from the automatic metallurgical samplers.

Operational parameters:
a) Airflow rates resulted in smaller volumes after the retrofit
b) Deeper froth beds were set in the three upgraded cells

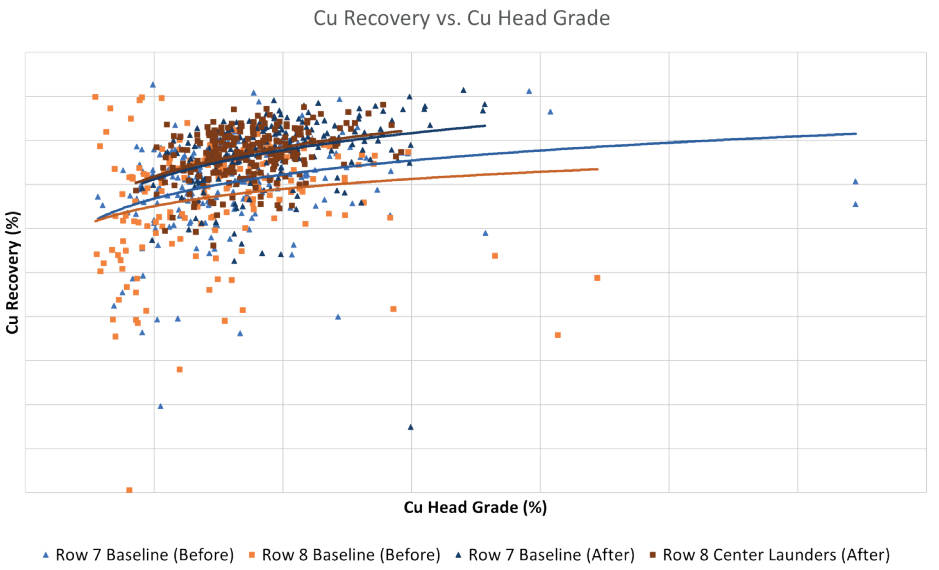
	TankCell 803		TankCell 804		TankCell 805	
	Baseline	Upgrade	Baseline	Upgrade	Baseline	Upgrade
Airflow rate (ft3/min)	865	639	946	683	868	655
Froth bed (inches)	9.8	12.0	9.4	12.7	9.9	12.0

Case: Kennecott Copperton, Utah

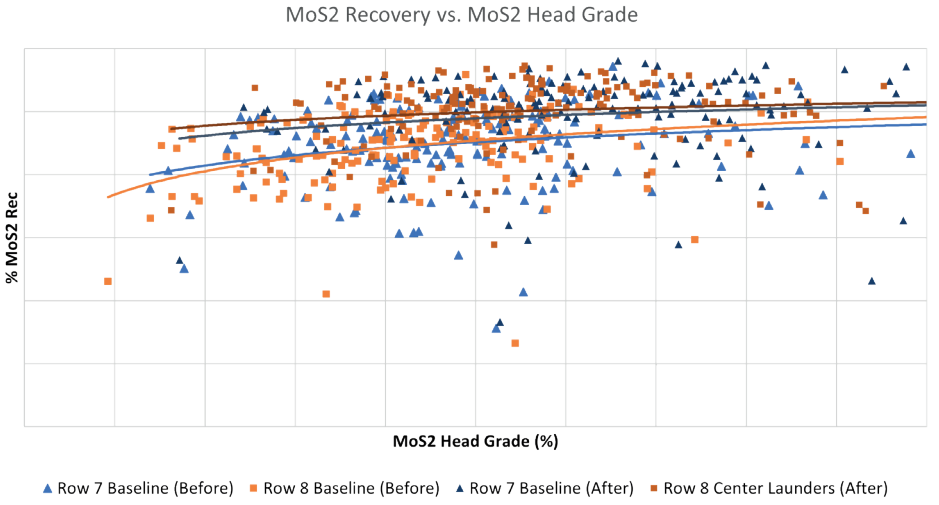
Improved recovery with a single upgrade

Results

- The concentrate launder upgrade drastically reduced froth transport distance to a third of its maximum value and increased to double the amount of crowding
- A metallurgical performance improvement was observed during the evaluation period of 0.74% in Cu and 0.82% in Mo for the rougher-scavenger row 8 relative to row 7
- Recovery values for Cu and Mo were more consistent during the upgraded evaluation period
- The airflow rate was reduced, impacting positively in the blower's energy consumption
- Froth beds were deeper after the retrofit, leading to better process control



Metallurgical recovery increase of 0.74% for Cu



Metallurgical recovery increase of 0.82% for Mo