## MDEC 2018









































	SANDVIK DU311	KV ITH DRI	LL
	PRODUCTIVITY ESTIMATION		
	Stope Size *Dimension: 20 x 15 x 25m, *S.G. of Nickel Sulfides -4.65 *Dilution: 50% (due to 30° OB dip)	Undiluted Tonnes: Diluted Tonnes (50%):	34,875T 52,313T
	CUBEX Meterage *95% Utilization, Delay Factor: 0.5 *Maximum Shift Productivity:180m (based off of industry averages in LH stoping mines)	Per Shift: Per Day:	86m 171m
	Production Rings Per Stope *THD: 3" holes at 2.0 x 2.0m spacing *ITH: 4.5" holes at 3.0 x 3.0m spacing	THD (AC Simba S7): ITH (Sandvik CUBEX):	 8
	Production Holes Per Ring *Calculated using PROMINE based on assumed Drillblock dimensions	THD (AC Simba S7): ITH (Sandvik CUBEX):	28 16
ATTA	Shifts Needed to Drill Stope *Based off average drill meterage per ring and average shift drill productivity	THD (AC Simba S7): ITH (Sandvik CUBEX):	37 22
		COST ESTIMATION	
	LOM Borehole Cost (for muck transfer) *\$60/m for a 12" hole (reamed 3 times) using ITH drill *LOM redrill factor of 12 (redrill includes cleaning holes as required) *Average drillhole length of ~150m (LOM → shorter in beginning, longer towards the end)		\$648,000
	Cost Per Tonne (Assuming 100% Skip Utilization, 1.5 MT/year)		\$0.036

Battery-Electric Trucks (Artisan Z40)		I IMAGINE A MINE WITH NO T	RUCKS.	
Capital Cost				
Artisan Z20 Truck		\$1,650,000		
Scaled to Z40		\$3,300,000		
Battery (x3)	\$550,000 x 3 =	\$1,650,000		
Charger (x1)	\$90,000 x I =	\$90,000		
	Capital Cost of I Truck	\$5,040,000		
Annual Capital Cost of 6 T	ucks (11 Year Usage)	\$2,740,000	COST OF TRUCKING	
Annual Maintenance Cost				\$6 47/t
Assumption: Required m	aintenance will decrease but	is offset due to more expensive parts		φ0.11/τ
Maintenance Cost, 5% of Up-Front Capital Cost of Trucks	6	\$990,000		
Parts Replacement Cost, 10% of Up-Front Capital Cost of	Trucks	\$1,980,000	CUSTOF	¢0 77/+
Ann	ual Maintenance Cost	\$2,970,000	THE LASTING IMPACT' $\mathbf{PU}$ .	
Power Consumption				
Assi	imption: 100% efficiency in	charge delivery from battery to motor		
Cost of Electricity per kWh 54 Motor Size (2 x 200kW motors) 64		\$0.09	DIRECT	SUDDER STORES
		400 kW	DIRECI	¢5 70/+
Hourly Utilization		90%	SAVINGS	\$5.70/L
Operating Hours Per Shift		8 hours	on million	
Power Cons	umed per Shift (6 trucks)	17,280 kWh		A4 004
Annual Power Cost (6 trucks, 360 operating days)		\$1,120,000		\$1.30/t
Operator Cost				
Assumption: Cost of employee in	cludes wage, benefits, and u	inion contributions among other costs		
Truck Operators (6 per crew, 4 total crews = 24 operators)	\$120,000 × 24 =	\$2,880,000	TOTAL SAVINGS	\$7.00/t
	Annual Operator Cost	\$2,880,000		
Annual Cost of Run	ning Battery-Flectric Trucks	\$9,709,000		
Cost ber Tonne Skibbed (100% utilization 1 5MT ber year)		\$6.47/T		
Cost ber Tonne Skibbed en	cluding Maintenance Costs	\$4 49/T		
*Note: Most bulk tonnage mining operations tend to aver- skipped.	age haulage costs between	\$4.00 and 4.75 per tonne	ELIMINATE A HEADACH	HE AND
			SAVE MONEY DO	DING IT!

## 



**REDUCTION IN ORE** 





## OMA event elicits novel mining solutions

📕 Laurentian University mining

engineering students clean up BY NORM TOLLINSKY

14 September 1, 2018 . Sudbury Mining Solutions Journal



EDUCATION

Our team decided it wouldn't but team decided it wouldn't be feasible to move material because it would require development to increase the capacity of the shaft, so we decided to only remove the actual metal from the ore."

udburyminingsolutions.com

"I talk to scoop operators and they tell me they absolutely hate loading trucks because their bonus isn't based on how many trucks they load. It's based on how many tonnes they draw, so if you're spending four or five hours per shift just loading trucks, that's five hours you aren't drawing tonnes," said Sharma, who is finishing up a 16-month co-op at Tahoe Resources' Timmins West Mine.

The decentralized crushing solution eliminates the haulage time to a remuck pile and the rehandling of the remuck to load trucks.

"Drilling is cheap. Trucking is enormously expensive," said Sharma, justifying the cost of the 12 to 30-inch boreholes required for the solution.

Once a stope has been mined out, the crusher would simply be relocated, which would require it to be configured for mobility.

Sharma cited the elimination of trucks and a big crusher as well as the excavations required for them as benefits over and above the increased productivity.







