

Wilson sump catches on for mine dewatering

■ From Nickel Rim South to Lac des Iles and, now, Barrick's Williams Mine

BY NORM TOLLINSKY

Bryan Wilson, general manager of North American Palladium's Lac des Iles Mine, 132 kilometres northwest of Thunder Bay, is probably the only person in the world to have a sump named after him.

Six years ago, while working at Xstrata's (now Glencore's) Nickel Rim South Mine in Sudbury, Wilson was tasked with coming up with a better sump solution. A new state-of-the-art mine, Nickel Rim was built using a sump design that had been in use in the underground mining industry for 100 years.

The two-section design featured a dirty sump and a clean sump separated by a weir. Mine water and fines filled the dirty sump, the fines settled and the water flowed over the weir into the clean sump. Water in the clean side was pumped to the mine's dewatering system and every once in a while, a loader was used to scoop up the solids from the dirty side and dump it somewhere.

There were several problems with the design. To begin with, loaders are designed to haul ore – not to descend into a soupy mess of slimes and risk damage to transmissions, differentials and radiators. Even worse, if someone forgot to send a loader in to clean out the sump, the solids in the dirty side filled up and flowed over the weir into the clean side, burning out the pump and causing a flood.

The solution Wilson came up with was to do away with the conventional two-section sump design, collect the water and the solids in a single sump and use GPM Inc.'s Eliminator slurry pump to pump the liquids and solids together.

Use of the Eliminator was recommended by Jeff Murray, technical representative of Sling Choker Manufacturing's fluid handling division in Sudbury. The heavy-duty submersible pump is designed to



handle 70 per cent solids and has built-in spray nozzles to agitate the solids.

"When we put the pump in the first sump, I told the supervisor, 'Stop mucking the sump. Don't put any more equipment in there. They tell me the pump can pump the mud. I want to see if it can,'" recalled Wilson. "It was a culture change for the shifters not to drive in there. I went by every day and that pump ran 24 hours a day, seven days a week. Jeff told me, 'don't worry, you can't hurt this pump.' I thought I'm going to run this thing to destruction. The pump was steaming, it was so hot, but I saw what it could do with very little water."

Instead of the large rectangular sumps excavated into a cutaway, Wilson opted for round precast concrete well-style sumps. In a new mine or level, the design reduces the size of the cutaway from between 20 and 25 metres long to 10 to 12 metres, noted Wilson. That alone saves up to \$60,000 per sump based on development costs of \$4,000 per metre.

The big savings though are in pump and mobile equipment repair costs.

"When we first went to Nickel Rim, there were \$650,000 of pump repairs every year," said Murray. "We took it down to

under \$20,000 per year. And that's just the cost of the repairs. It doesn't include the electrician's time, the logistics to get it to surface and lost production. The savings were probably over \$1 million annually."

The Wilson sump also eliminated the use of prime movers, scissor lifts and boom trucks for sump maintenance, and slashed loader repairs. Based on cleaning one sump per week per level at Nickel Rim South, Wilson estimated a saving of 156 shifts per year spent mucking out sumps.

Slowly but surely, the Wilson sump is catching on – at Lac des Iles, where Wilson now serves as general manager, and, more recently at Barrick Gold's Williams Mine in the Hemlo camp on the recommendation of Brian Wallenius, Sling Choker business development manager in Sault Ste. Marie. The Wilson sump has also been adopted by several other mines in Ontario and Quebec, and perhaps even globally.

Miners love it "because they're the ones who are stuck dealing with the mess associated with the cleanup of the old sumps," said Wilson. "I remember one veteran construction miner coming to my office one day and shaking my hand. I said, 'what's that for?' He said, 'that new sump. It f----- works.' That was the turning point

"I'm not a guy who wants his name on a sump. I don't chase fame. I don't need it, but if somebody gets something out of it, if the mining industry gets a little better because of Bryan Wilson, I'm in. I just want to share what I've learned."

Bryan Wilson,
General Manager, Lac des Iles Mine

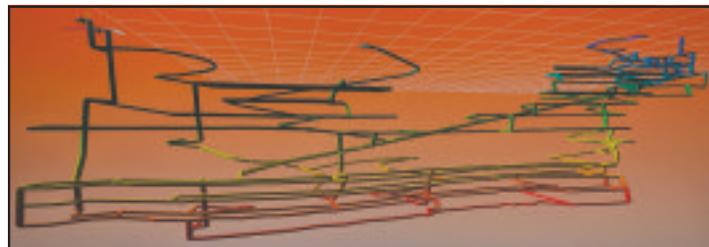
because as management and engineering teams, we can talk about that stuff, but to actually have miners accept it, that was huge."

Echoing the construction miner's assessment, Murray describes dealing with underground sumps as "latrine duty. There's nothing glorified about it. A scoop tram operator wants to go into the muckpile. He wants to move ore because he gets paid bonus. There's no bonus for mucking out a sump."

The solids and liquids pumped by the GPM Eliminator have to be separated at some point – usually in a clarifier or settling tank adjacent to the mine's main dewatering station. The clean water is pumped to surface, while the solid material is pumped to a dead stop, where it's left to decant.

"Everyone thinks that sumps are waste, but every time I've been on a sump project and sampled the sumps, I found them to run the average grade of the orebody, so I set up a settling tank at the bottom end to capture the solids, blend them with the ore and take them up to surface for milling," said Wilson.

The adoption of the Wilson sump design by a growing number of mines in Northern Ontario is an interesting example of how innovative ideas proliferate in a mining cluster. Miners, contractors and suppliers change jobs, move around, interact and share best practices. It's cross-pollination at its best and an important means of continuous improvement. ■



- Ventilation and Cooling System Design
- Heat load and CFD modelling
- Automation and real-time monitoring

Enquiries@BBEGroup.ca
705-682-9600
www.BBEGroup.ca

1 Serpentine St – Unit A
Copper Cliff, Ontario
P0M 1N0, Canada

BBE CONSULTING CANADA

MINE VENTILATION AND BULK AIR CONDITIONING SPECIALISTS

- Bringing air and cooling to the hottest and deepest mines worldwide

