

Wilson Sump Design Reduces Pump Maintenance Costs

New Design Incorporates GPM-Eliminator™ Pumps to Revolutionize Underground Mining Dewatering Operations

SUMMARY

Nonferrous mining supports everyday life and is critical in building a more sustainable future - but it is messy work. Necessary, but messy. Separating metals and minerals from waste materials requires a powerful dewatering system consisting of heavy-duty submersible pumps. If a pump fails and the system breaks down, frequent maintenance and time-, labor- and cost-intensive waste removal methods are implemented. Modern mines, incorporating the GPM Wilson Sump design - coupled with high-powered GPM-Eliminator™ submersible pumps - eliminate breakdowns and minimize process interruptions for an instant improvement in operational efficiency.

THE SITUATION

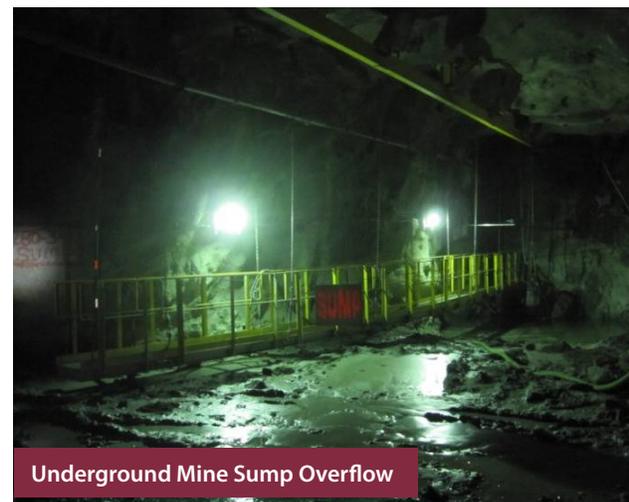
A Canadian nickel mine had a big problem. Increased demand for nickel and other precious metals created an opportunity to ramp up production, but the mine's current dewatering system was not up to the task. It simply lacked the capacity to handle buildup from slimes, synthetic fibers and shotcrete, and was burning out pumps fast.

Sumps were flooding regularly due to pump failure, despite pumps being changed out and repaired weekly. Pump maintenance and repair costs alone added up to over \$600,000 every year, not to mention over \$100,000 in labor and nearly 1 million hours dedicated to scooping the sumps with machinery not designed for this type of wet work.

This operational model was unsustainable, resulting in 1,750 hours of downtime in a single year. After crunching the numbers, it was clear. The existing dewatering system had to be improved.

THE PITFALLS OF TRADITIONAL SUMP DESIGNS

A traditional two-section sump requires two pumps - the first for slurry/dirty water and the second for clean water. The dirty pump processes mine water and fines, pumping water into the clean side of the sump. The challenge being that the dirty side gets... dirty. Very dirty. Fines, slimes and solids from shotcrete build up, and must be removed with a large scoop truck not designed to fit into the sump's tight places. If the sumps aren't cleaned regularly, the solid material can spill over to the clean sump, which can burn out the entire system.



THE CHALLENGE

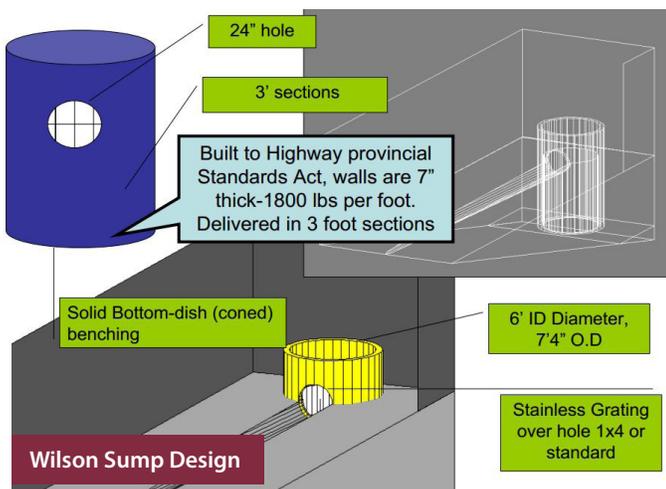
How can a mine dewatering system be retrofitted to handle more solid waste material without increasing pump maintenance and repair costs?

THE SOLUTION

The mine's internal engineering team pinpointed four improvement areas; all centered around improving the dewatering design.

- Shotcrete Receiving
- Pump Replacement
- Fines Recovery
- Eliminating Scoops in the Sumps

The solution was a revolutionary new design requiring a complete retrofit of the traditional two-sump design. The new Wilson Sump design collects water and solids together in a single sump and requires an incredibly heavy-duty submersible slurry pump to move the materials through the system. The system can be arranged in a cascading layout to pump from the bottom of the mine shaft all the way to the surface efficiently and cost-effectively. The **only** pump up to the task is the GPM-Eliminator submersible slurry and dewatering pump.



GPM's line of slurry and dewatering pumps are built for the toughest applications and environments. With a carefully designed, heavy-duty construction built for pumping anything from clean water to 70% abrasive solids, the GPM-Eliminator provides the reliability, dependability and performance that mining operations demand.

THE MADE TOUGH™ DIFFERENCE

After an initial test with a GPM-Eliminator 2GT to confirm the GPM-Eliminator's solids-moving capacity, the engineering team opted to install 17 Eliminators into the newly-converted Wilson Sump systems throughout the mine. The results were immediate and impressive.

During the first year, pump repair costs decreased from over \$600,000 to a mere \$5,200.

The trickle-down effects continue to improve mine operations. The Wilson Sump allowed the mine to handle slimes and waste material in a central location at the bottom of the mine. Because the design works more efficiently throughout the entire operation, it doesn't require the sumps to be mucked. The GPM-Eliminator's continuous spray-hole agitation capability pumps the solid material out of the system, removing the need to capture solid materials in filter bins and subsequently use scoops to clean the sump. Without the need for scoops, the mine eliminated over 150 annual shifts of labor and manpower. The GPM-Eliminator handles the dirty work effortlessly.

Additionally, after the Wilson Sump design was set in place, it has continued to operate efficiently for over a decade with minimal pump maintenance required. Instead of monthly pump replacements, the GPM-Eliminators need service just once annually, on average. Combining the Wilson Sump with GPM-Eliminator slurry pumps creates operational efficiencies and significant cost savings throughout an entire underground mining operation. Increased uptime, decreased labor and maintenance and a standardized design make the Wilson Sump an effective solution for dewatering systems.

