

MINING

Norilsk Mine Pipeline Scaling Case Study Norilsk, Russia

*Hydro*FLOW® Custom 12″ units reduced pulp pipeline occlusion rates by 8.8x and increased pumped concentrate mass by 2.26x in a mine hydrotransport system.

8.8x	2.26x	372d	200mm
Lower Occlusion Rat	More Concentrate Pumped	Projected Pipeline Operation	Deposits Controlled

⇄ BEFORE & AFTER

BEFORE

- Pipeline blocked in under 1.5 months
- Deposits reached up to 200mm thick
- Flow fell to critical level after 42 days

AFTER

- ✓ Occlusion rate reduced by 8.8x
- ✓ 2.26x more concentrate pumped
- ✓ Maintenance intervals extended

OVERVIEW

At a mining and smelting operation in Norilsk, Russia, sulphide concentrate was transported through a hydrotransport pipeline system. Lime addition caused heavy lime and gypsum deposits, reducing carrying capacity and disrupting production.

⚠ CHALLENGE

Heavy lime and gypsum deposits reduced pipeline carrying capacity and caused rapid occlusion.

- Pipeline blockage could occur within 1.5 months
- Deposits increased when pulp density exceeded 1.3
- Deposit thickness reached up to 200mm
- Reduced carrying capacity disrupted production

SOLUTION

Two *Hydro*FLOW® Custom 12″ units were installed on two pulp hydrotransport pipelines on 30 March 2012, without stopping the system.

UNITS INSTALLED
2x *Hydro*FLOW® Custom 12″

PIPELINE DIAMETER
219 to 245mm

INSTALL DATE
30 March 2012

OPERATING TEMPERATURE
60 to 70°C

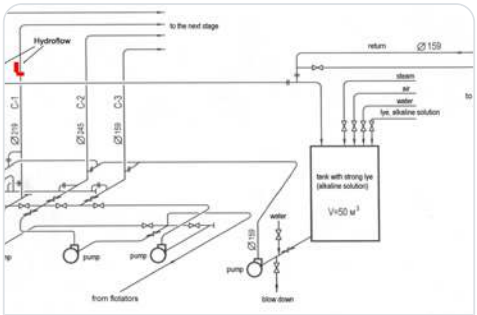


DIAGRAM
Hydrotransport layout



INSTALLATION
Units on pipelines

RESULTS

8.8x Lower Occlusion
Pipeline occlusion rate was calculated to be 8.8 times lower.

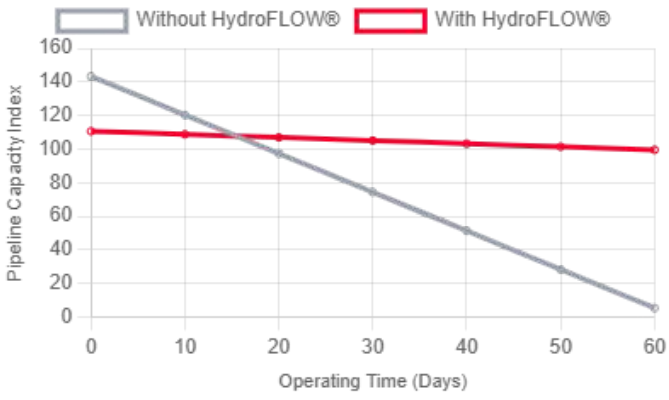
2.26x More Concentrate
Pumped concentrate mass over 45 days was 2.26 times higher.

372 Day Projection
Protected pipeline was projected to reach critical flow after 372 days.

Improved Flushing
Flushing performance improved while using lower alkali concentration.

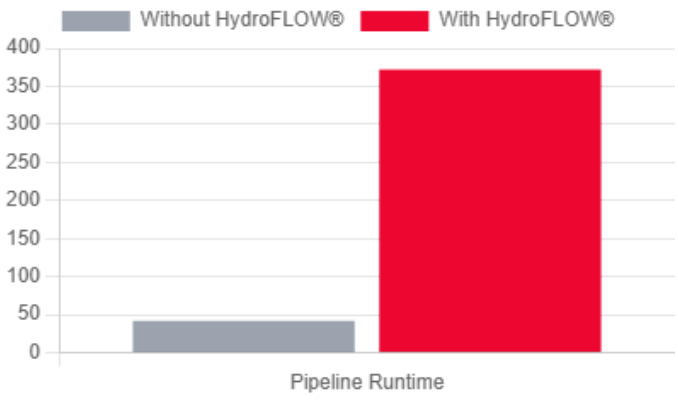
GRAPHS

Pipeline Capacity Trend

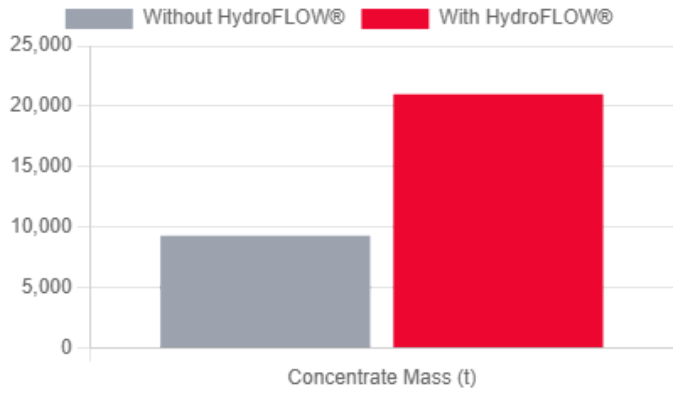


Pipeline carrying capacity trend with and without HydroFLOW treatment.

Time to Critical Flow



Projected operating time before critical flow conditions are reached.



Pumped concentrate mass over 45 days was 2.26 times higher with HydroFLOW® treatment.

KEY TAKEAWAY

Summary

At a Norilsk mining and smelting works, lime and gypsum deposits were blocking pulp hydrotransport pipelines and reducing carrying capacity. Two *Hydro*FLOW® Custom 12" units were installed in March 2012. Occlusion rates were reduced by 8.8x, pumped concentrate mass increased by 2.26x, and the protected pipeline was projected to operate for 372 days before reaching critical flow.

8.8x	2.26x	372d
LOWER OCCLUSION	MORE CONCENTRATE	PROJECTED RUNTIME

ADDITIONAL PHOTO EVIDENCE



BEFORE

Pipeline blocked with gypsum deposits

HYDROPATH

Ready to reduce pipeline occlusion?

Contact Hydropath to discuss scale control in mining operations.

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