

Case Study

“Recover the maximum ounces of gold”
Agnico Eagle Meadowbank Complex – Northern Canada

INTRODUCTION

At the Meadowbank complex in Northern Canada, ore from the Amaruq deposit is comminuted and separated to recover gold from the gangue (tailings). Density meters are needed for control purposes in the grinding and separation processes. These instruments help the operators to monitor the efficiency and fully utilize the production capacity. The outputs of density meters and flow meters are combined to calculate the production output. Agnico Eagle chose to replace conventional nuclear sources (part of the initial plant design in 2008) by Rhosonics’ sustainable ultrasonic density meters.

CHALLENGES

- Improve process control with real-time density data
- A consistent cyclone feed (target density)
- Stability in the feed density of the regrind mill
- Use radiation-free and reliable density meters

INSTRUMENTS USED

Ultrasonic Slurry Density Meters (SDM) of Rhosonics. These were assembled inline via a 4” spool type UFTP made in carbon steel with PU liner.



Figure 1: The Rhosonics Slurry Density Meter (SDM)

AGNICO EAGLE – MEADOWBANK

Agnico Eagle was founded in 1957 and is one of the largest gold mining companies in the world. Agnico Eagle started to operate their Arctic Meadowbank mine and complex in March 2010. Today, the complex is processing ore from the Amaruq satellite deposit. The Meadowbank mill is expected to operate at 9,000 to 10,000 tonnes/day Amaruq ore. Total processing capacity of Meadowbank is 11,000-tonnes/day.



“ The SDM helps the operator to have stability in the circuit and recover the maximum ounces of gold at the end of the day. ”

Eric Mercier, Metallurgist, Agnico Eagle



OUR SOLUTION

The Rhosonics SDM can provide real-time readings on the densities of the slurry flowing in the regrind circuit. The measurements are reliable, stable and friendly to the work environment. Since the device is non-nuclear, calibration is made easy and RSO training for radiation safety is not needed. Agnico chose to use a Rhosonics RCU device for convenient (remote) control of the SDM unit installed in the cyclone feed.

MEASURING TASKS

Measuring slurry density in two different applications in the regrinding circuit at the gold processing plant.

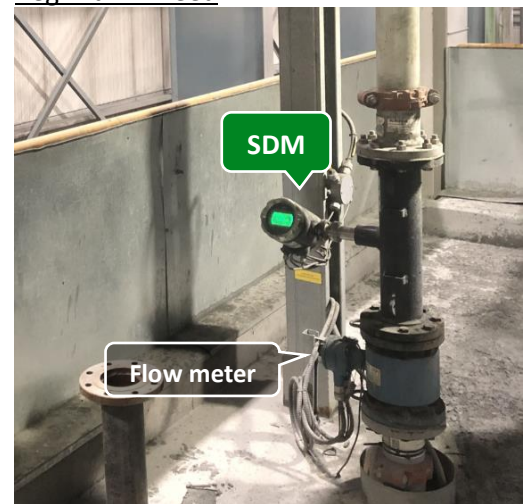
- Grinding mill feed (in the regrind circuit)**
 Pipe diameters: 100 mm (4 inch)
 Pipe material: Carbon steel with PU liner
 Solids: 50 - 60 wt%
 Density: 1,500 grams per liter
 Flow velocity: 1 - 3 m/s (25 – 80 m³/hr)
- Cyclone feed (in the regrind circuit)**
 Pipe diameters: 100 mm (4 inch)
 Pipe material: Carbon steel with PU liner
 Solids: 20 - 25 wt%
 Density: 1,200 grams per liter
 Flow velocity: 1 - 3 m/s (25 – 80 m³/hr)



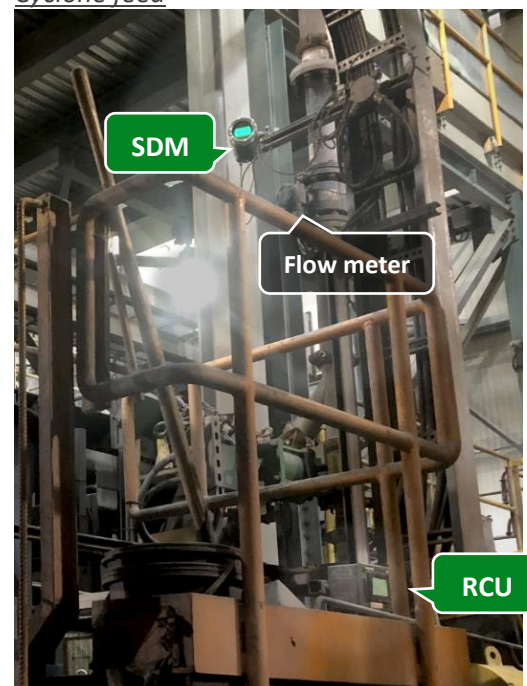
Figure 2: The Rhosonics Remote Control Unit (RCU)

APPLICATIONS

Regrind mill feed



Cyclone feed





RESULTS

Agnico Eagle is currently using the Rhosonics density meters for 18 months (since June 2019) at 2 different locations in their regrind circuit. Some of the results are:

- Ability to directly detect changing process conditions
- Reaching target density and production output
- Process operators use the density value to achieve stability in the circuit and recover the maximum ounces of gold. Real-time density control helps them to operate at a proper density level and prevents piping to block. Using a flow meter, they also calculate the production output (mass flow).
- The device saves costs on inspections, procedures and licenses related to radiation safety. According to the site electricians, the SDM was easy to install and requires little maintenance.
- The density meters save a lot of time spent on manual sampling using a Marcy scale. The number of manual samples is reduced drastically. Without on-line assessment, a sample would be taken three or four times per shift. One sample takes about five minutes - considering three shifts and four samples per shift, it would take about 60 minutes a day.

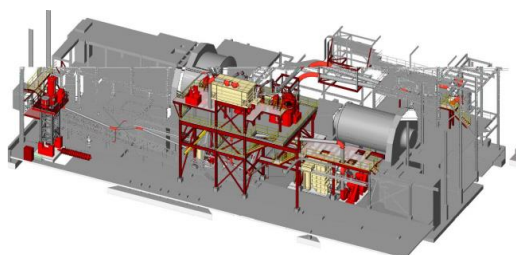


Figure 3: View of the Meadowbank grinding circuit

MEASUREMENT ACCURACY

The metallurgical team confirmed reliable density results from the Rhosonics instruments during their weekly sampling verification. Operators are achieving more stability in the process using the real-time results provided by those instruments. The number of manual samples is reduced and the reliability has increased - reliability of manual sampling is a doubt, since every individual would sample differently.

“ The density meters work well. We do a quick verification with Marcy once per week. If we need to adjust, we call the electrical department and they come. Density takes 5 minutes to take, but 3-4 times per shift x 5 minutes, that is a lot of time consuming. Having these instruments online is really efficient and operators love them. ”

Eric Mercier, Metallurgist, Agnico Eagle

FURTHER INFORMATION

Please contact Rhosonics or a local distributor [»](#).

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