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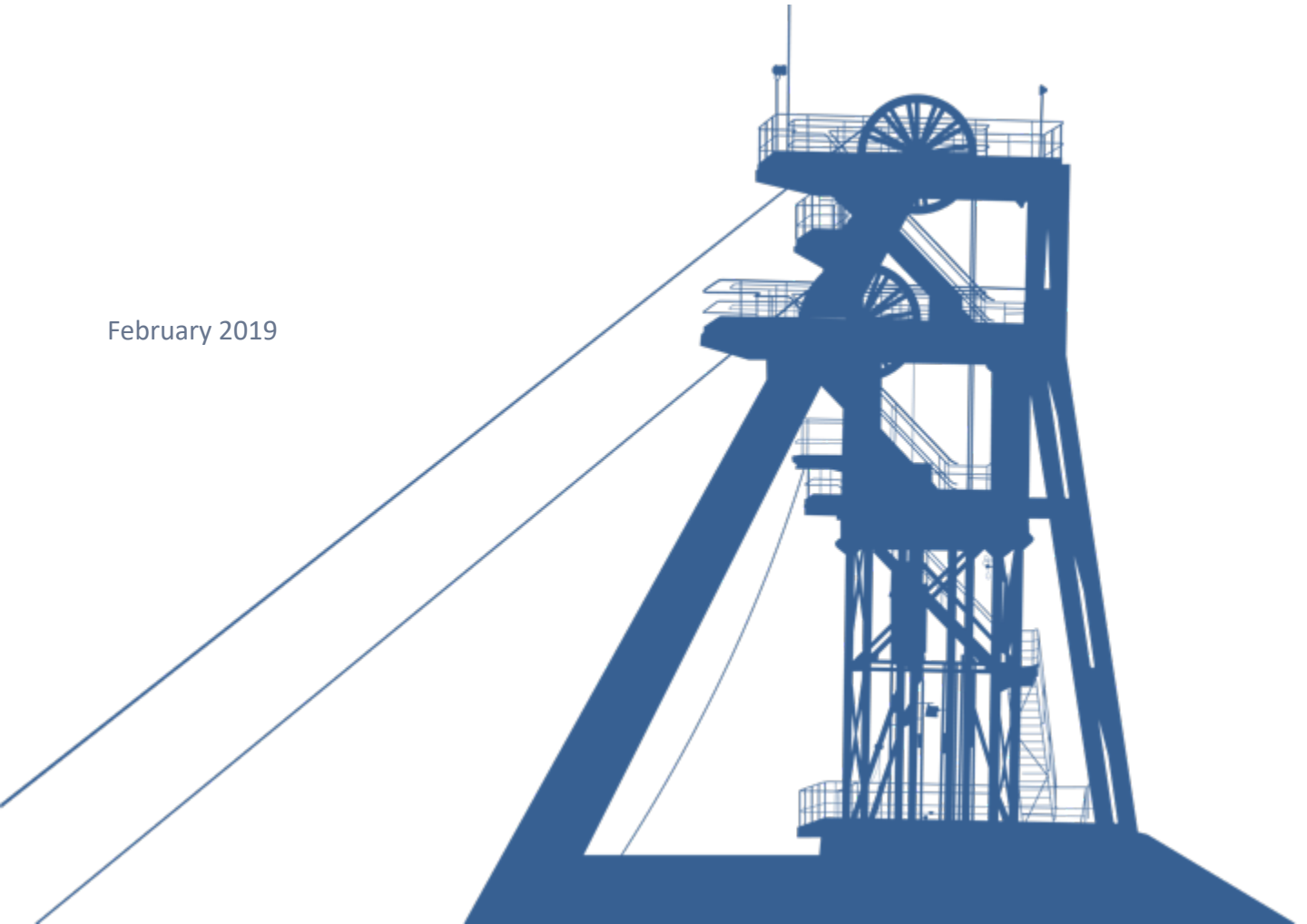
Improved Drilling Supervision Increases Stope Advance: Insights From An International Gold Mining Company

February 2019




Kelmic

About Kelmic

Kelmic Consulting helps organizations capture opportunities and dramatically improve their operations.

We partner with our clients to drive bottom-line impact by addressing and dramatically improving efficiencies in People, Processes, and Property. Our exceptional people draw upon more than 100 years of combined experience to bring you the right perspectives and expertise to help you tackle complex challenges and realize your strategic ambitions.

Helping our clients improve their operations since 2002

Background

About the Client

- New ventilation shaft for underground gold mine owned by international mining conglomerate
- Mine consists of 7 producing shafts
- Producing 90,000 t of ore per annum
- Mining at between 7,000 and 8,500 ft below surface
- Currently opening new section, installing ventilation and service tunnels

This mine formed part of an international mining group's portfolio of mines. This flagship mine with 7 producing shafts was in the process of opening a new section and running services to enable production.

Progress was well behind schedule and existing stopes were nearing end of life with a pressing need to accelerate the installation of basic services to allow production to move to the new stope faces.

A review of operations showed poor consistency in blast advance within different drill teams varying by as much as 23%. Progress was also hampered by needed rework due to misfires preventing full clean-up.

Drilling accuracy was also creating oversized rock at the face leading to difficulty with extraction. Follow-up day crews were consistently hand drilling oversized rock to enable loading into dollies.

While the shaft safety record was good, several recent near misses combined with a constantly changing labor force was giving rise to concern.

Supervisor skill levels were generally poor, with some individual stand-outs with longer tenure.

Constant pressure to increase production was supported mainly with additional labor. Incremental labor was poorly deployed and adding little to production. labor turnover was high with average tenure less than 9 months.

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23%

Current projections indicated that stoping crews would catch up within 19 months causing a halt to production until the services tunnel intersected with the new ventilation shaft currently being sunk.

Service tunnel advance needed to be improved by at least 10% to ensure the services team remained ahead of production to prevent a stop to production.

Implemented Solution

An extensive education and training program was designed and delivered. The program focused on three key areas:

1. supervisory skills;
2. technical (drilling) improvement; and
3. safety.

Short interval control mechanisms were introduced at the face. Supervisors were trained on what to look for to improve drilling accuracy.

Holes were consistently measured by operators and checked frequently by supervisors for depth, angle, spacing, etc.

Early shifts were established with experienced team leads to check clean-up, predrill oversized rock and mark each face before main shift crews arrived.

Shift start-up and shift end meetings were introduced to monitor production progress, quality and safety.

Inter-team competitions with small incentive prizes were established for best performing teams each week.

Weekly supervisor training sessions were established to transfer knowledge from experienced supervisors to newer, less experienced ones.

Drilling accuracy dramatically improved and average advance per blast increased by up to 12%.

Safety awareness significantly improved among the supervisors and frontline workers.

Kelmic's proposed solution helped improve drilling accuracy and average advance per blast by up to

12%

Key Results Achieved

- Increased advance per blast by average 12% in ventilation drive
- Improved supervisor skills
- Improved supervisor-worker relationships
- Reduced misfires by 46%
- Improved safety awareness with daily stope safety meetings
- Improved stope clearing efficiency increasing tons produced
- Project ROI > 17:1 within 12 months

ROI

17:1

12%	Increased	Reduced
Increase in advance per blast	Ore recovery per shift	Blast failures

Kelmic at a Glance

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