



NORTHERN STAR
RESOURCES LIMITED

Pogo Optimization & Successes: 2024 Operational Update

AMA Nov 7th, 2024

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Disclaimer and Forward-Looking Statements

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Authorised to release to the ASX by Stuart Tonkin, Managing Director & CEO.

ASX Listing Rule 5.23 Statement

The information in this announcement that relates to the current Ore Reserves and Mineral Resources of Northern Star has been extracted from the ASX release by Northern Star entitled "Resources, Reserves and Exploration Update" dated 2 May 2024 available at www.nsrld.com and www.asx.com ("Northern Star Announcement").

Northern Star confirms that it is not aware of any new information or data that materially affects the information included in the Northern Star Announcement other than changes due to normal mining depletion during the six month period to 13 September 2024, and, in relation to the estimates of Northern Star's Ore Reserves and Mineral Resources, that all material assumptions and technical parameters underpinning the estimates in the Northern Star Announcement continue to apply and have not materially changed. Northern Star confirms that the form and context in which the Competent Person's findings are presented have not been materially modified from that announcement.

The information in this announcement that relates to Group production targets (including subsets of such targets) to FY26 was first reported in the ASX release by Northern Star entitled "5 Year Strategic Plan - 2021 Investor Day Presentation" dated 21 July 2021 available at www.nsrld.com and www.asx.com. Northern Star confirms that all the material assumptions underpinning those production targets continue to apply and have not materially changed.

Rounding is applied in this presentation for the percentage comparisons and for all Ore Reserves and Mineral Resources figures. Mineral Resources are inclusive of Ore Reserves; and numbers are 100% NST attributable.

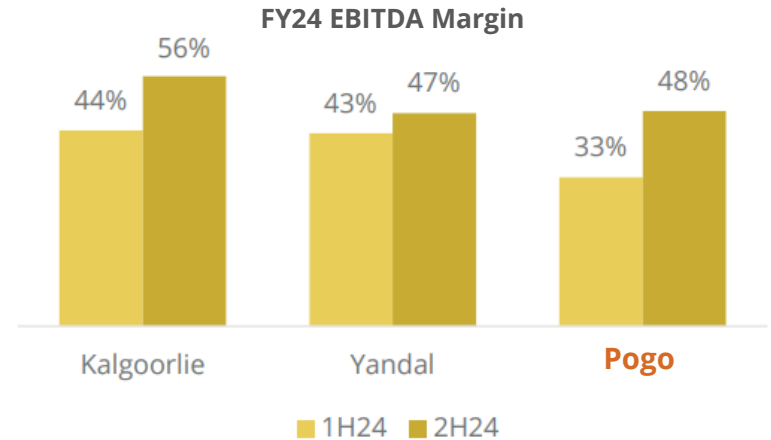
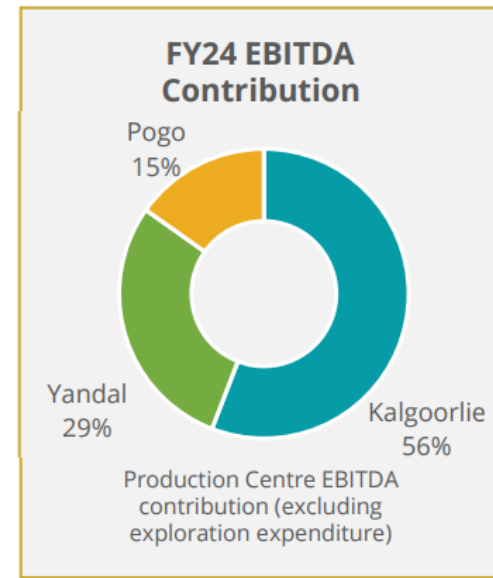
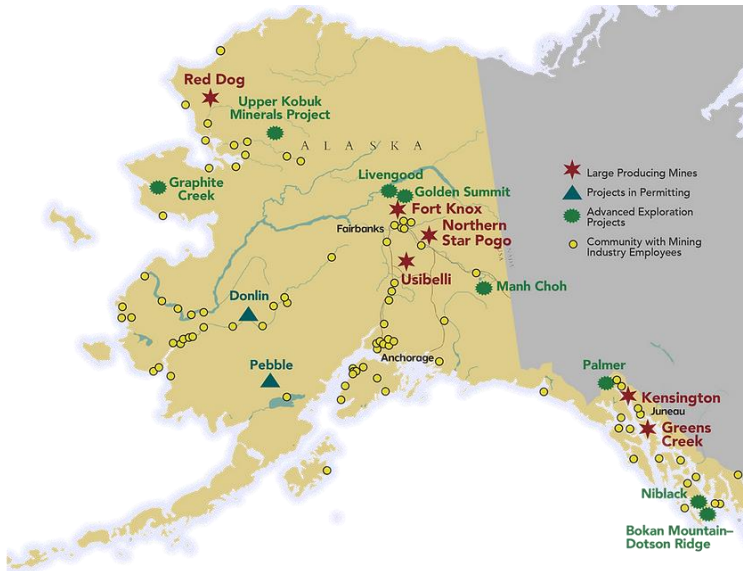
These figures represent JORC 2012 Mineral Resources and Ore Reserves for the combined assets owned by Northern Star.

MINERAL RESOURCES as at 31 March 2024												
NST ATTRIBUTABLE INCLUSIVE OF RESERVE	MEASURED			INDICATED			INFERRED			TOTAL RESOURCES		
	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)
NORTHERN STAR TOTAL	187,219	1.1	6,424	534,201	2.0	34,389	342,602	1.9	20,509	1,064,223	1.8	61,322

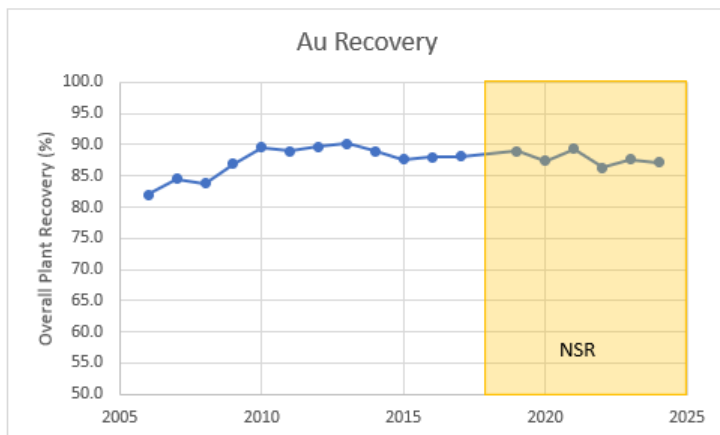
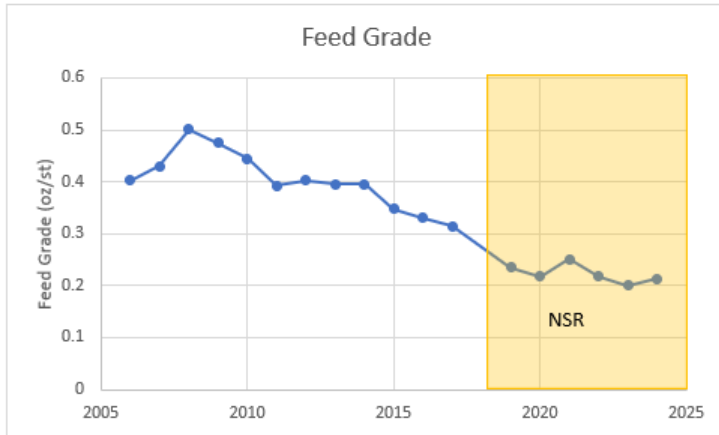
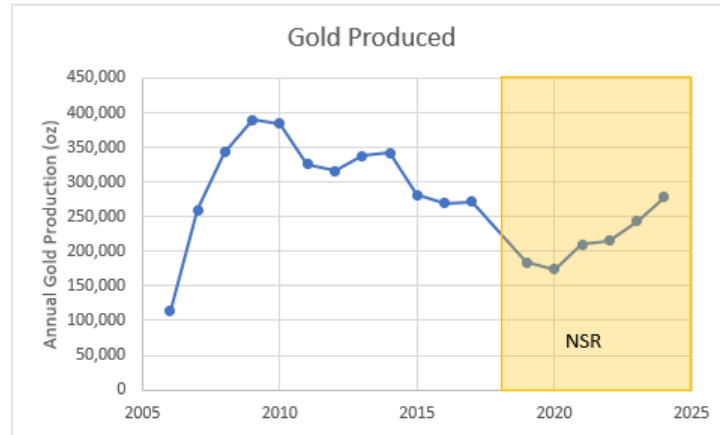
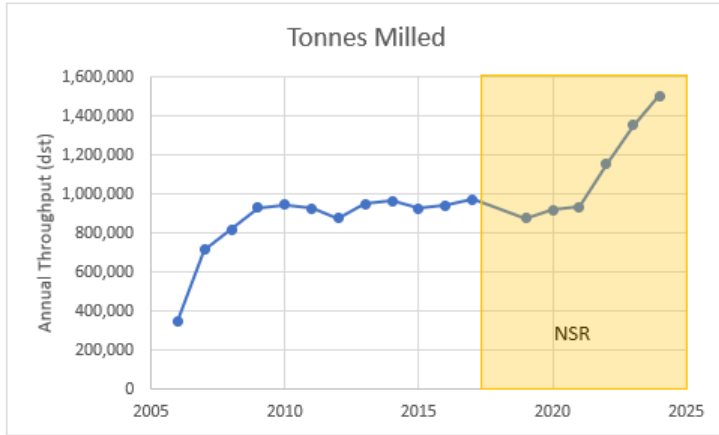
ORE RESERVES as at 31 March 2024									
NST ATTRIBUTABLE RESERVE	PROVED			PROBABLE			TOTAL RESERVE		
	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)	Tonnes (000's)	Grade (gpt)	Ounces (000's)
NORTHERN STAR TOTAL	165,975	0.9	4,679	264,612	1.9	15,255	430,587	1.5	20,934

Pogo: A Tier-1 location and growing Group contributor

- Located in the upper Goodpaster River Valley, ~90mi southeast of Fairbanks, ~40mi northeast of Delta Junction
- Within the Tintina Mineral Belt, a metal province stretching much of interior Alaska, through the southwestern Yukon
- Northern Star acquired the Pogo Mine in September 2018

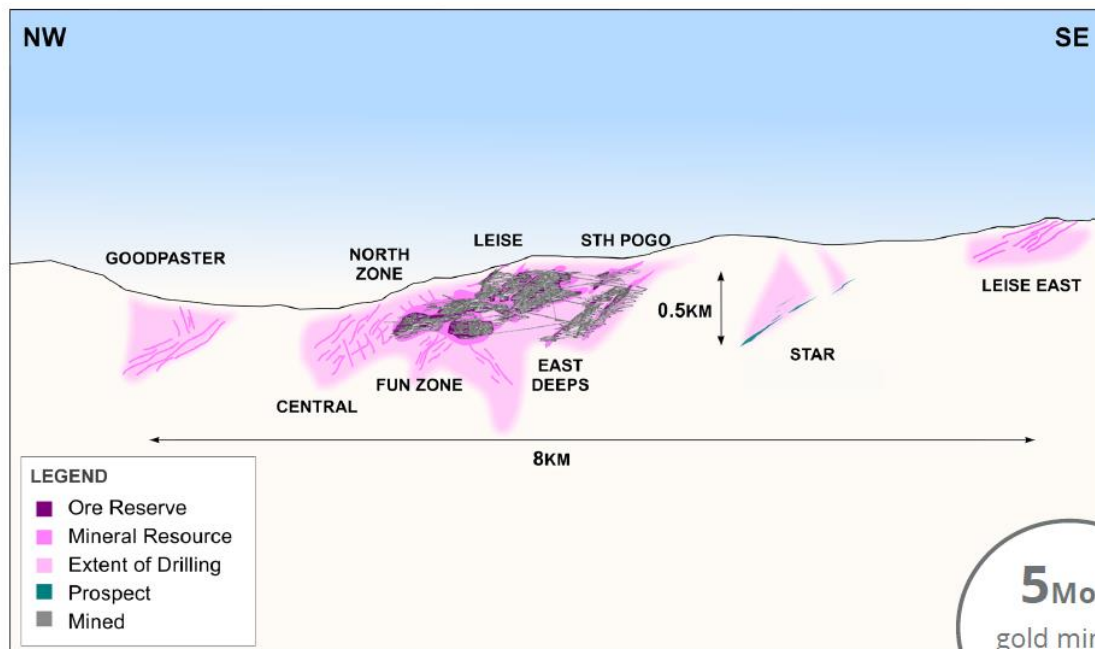


Pogo Mine – Historical Production



Pogo Production Centre preparing for the next decade

- High-grade Resources
10.1g/t;
Reserves at 8.0g/t
- Lowering costs through growth and optimisation
- In-mine and near regional opportunity



6.7 Moz
Mineral Resources

1.5 Moz
Ore Reserves

+10 Years
Mine Life

5 Moz
gold mined
over 17 years

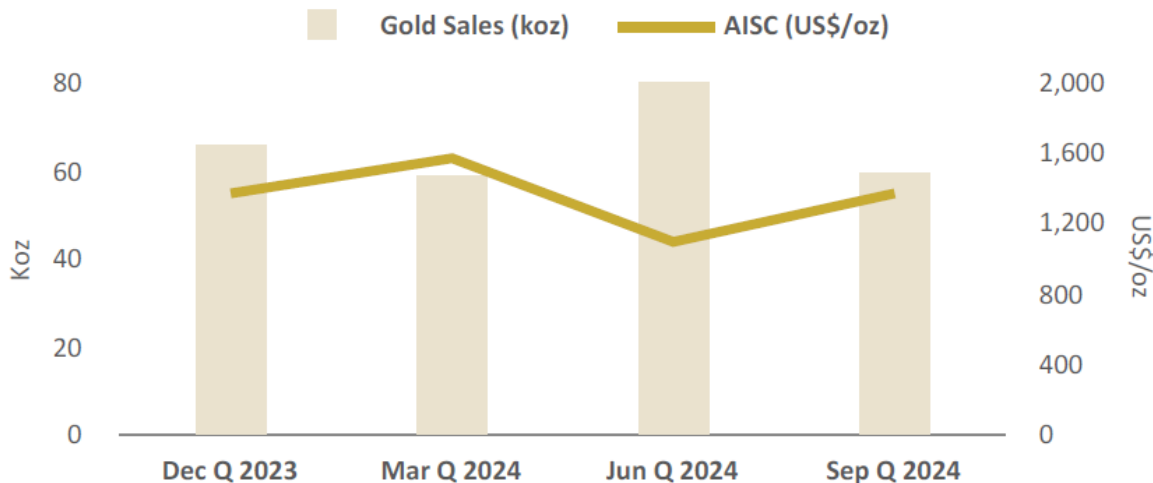
Recent Production and FY2025 Guidance

FY2024 (Jul 23 to Jun 24) Production

- 278koz at AISC US\$1335/oz. US\$39M spent in growth capital
- June Quarter 91koz at AISC US\$1091
 - Record Quarter under NSR Ownership
- September Quarter 60koz at US\$1367/oz
 - Significant shutdown conducted (5 weeks of partial production on SAG only ~70tph)
 - Completed on schedule and budget

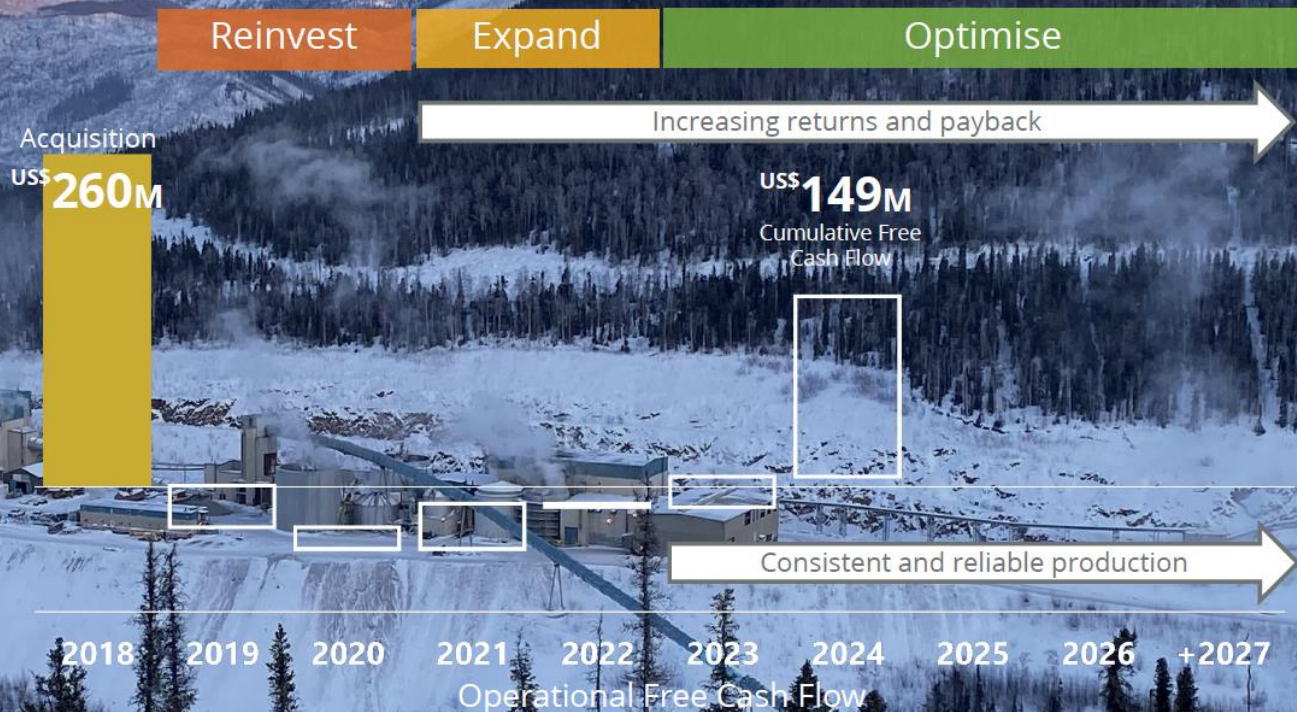
FY2025 Guidance

- 255-265koz sold
- AISC US\$1395-1460/oz
- Growth Capital US\$60-65M



Pogo

positioned for higher free cash flow



Operational free cash flow is pre-tax and excludes corporate and technical services costs.

Operational Free cash flow is defined as Production Segment EBITDA less sustaining capital, growth capital, exploration and development receipts. Sustaining and growth capital includes equipment lease repayments.

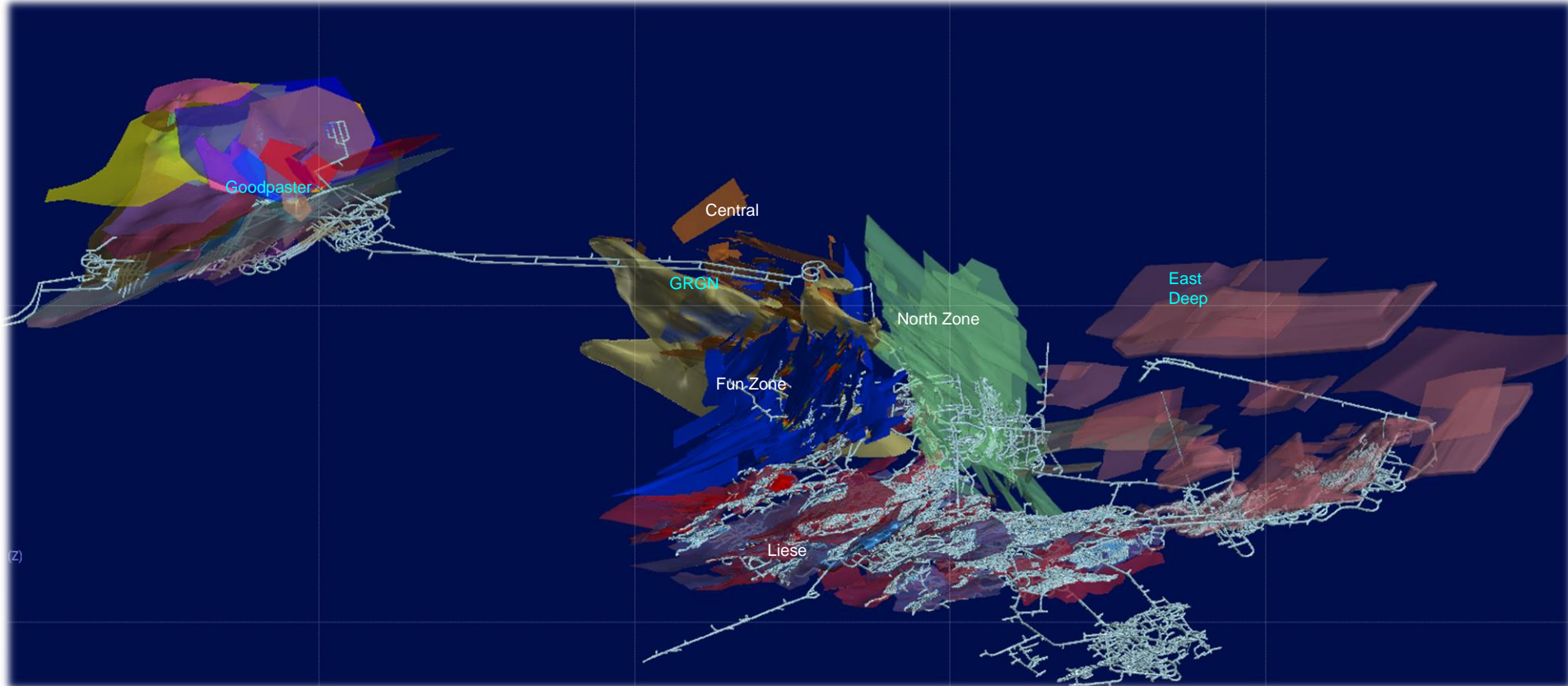
An aerial photograph of a mountain valley. A winding river flows through the center, surrounded by dense forests. In the foreground, there is an industrial site with various structures and roads. The background shows rolling mountains under a clear sky. A large, semi-transparent yellow arrow graphic points from the top right towards the center of the image.

Geology Successes and Optimization

Expanding Life of Mine

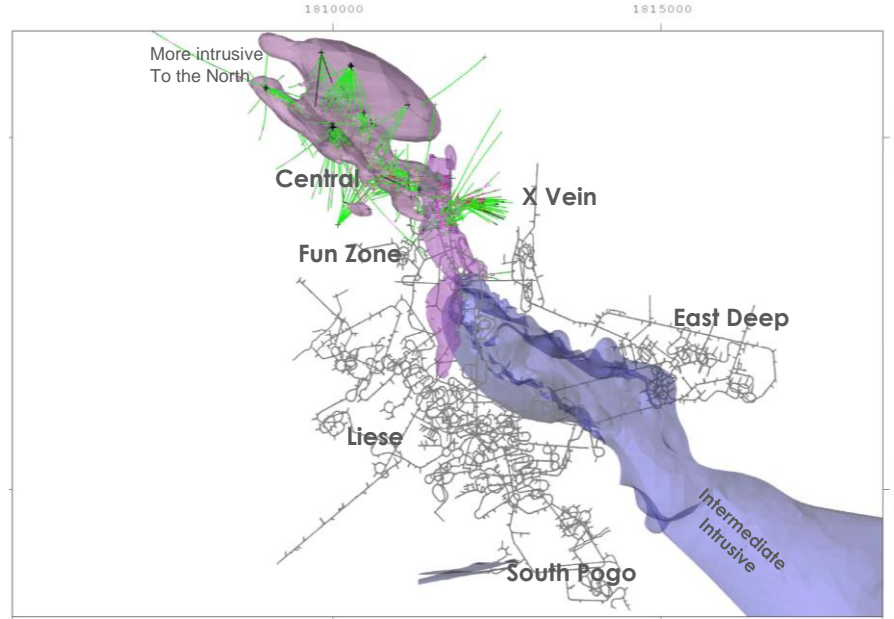
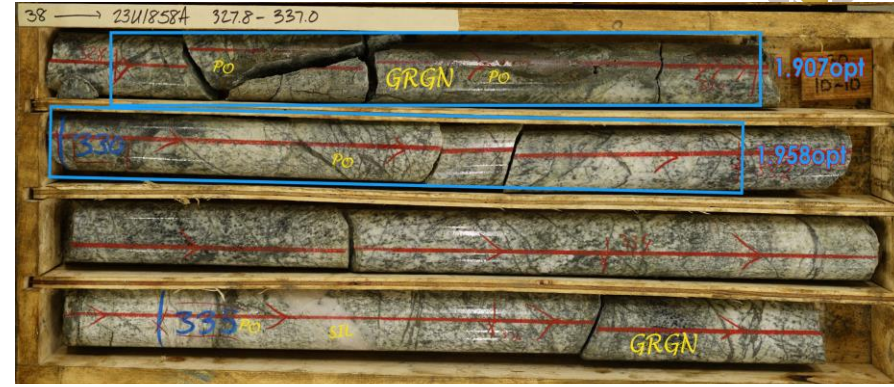
- Resource 20.5Mt at 10.1gpt for 6.7Moz (US\$1800/oz)

- Reserves 5.9Mt at 8.0gpt for 1.5Moz (US\$1500/oz)



Different Mineralization Styles

- New mining zones are being defined in rock types previous thought of as non-hosting
- Mineralization within Intermediate Intrusives have been successfully targeted and will likely be key part of Pogo production in the future
- A zone of Granitic Gneiss previously thought to be solely a source rock for the gold and is now recognized as a host rock for mineralization



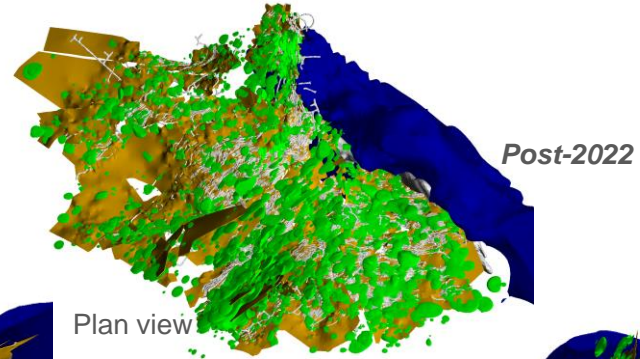
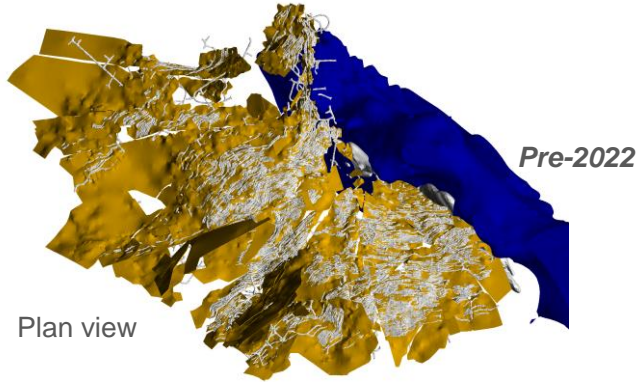
Evolution of Drill Targeting Methods

- **Improved Modelling Software**

- Automated generation of grade halos around unassigned anomalous grade for future evaluation
- Creates greater opportunities for drill targeting

- **Optimization of Workflow**

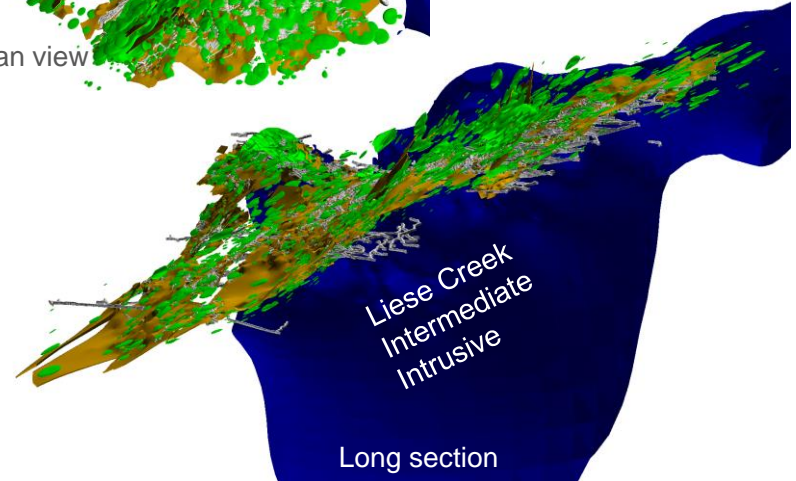
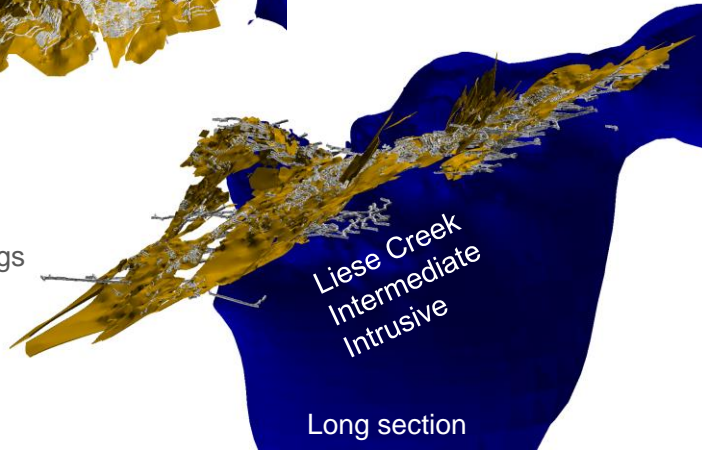
- Reduction of need for manual modelling
- Provides improvement of record keeping and allows robust audits for historical accuracy



Plan view

Plan view

- Liese Vein
- Historical Workings
- Grade Halos



Long section

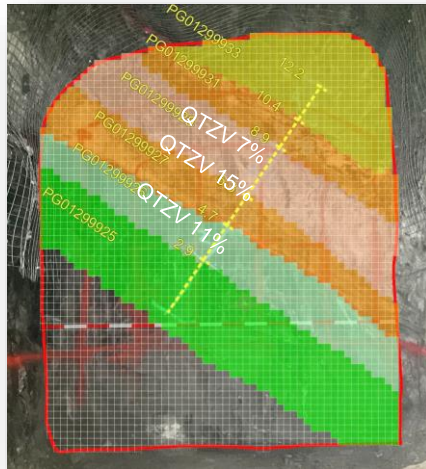
Long section

Digital Mapping Technology

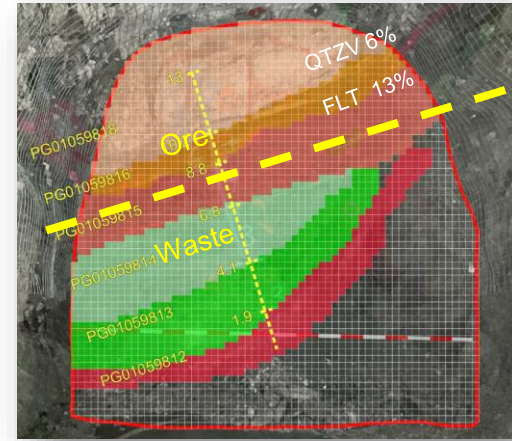
- **Instantaneous Ore/Waste Calculation**
 - Using the area percent of QTZV and average vein grade to calculate estimated face grades
- **Split Fire**
 - Ability to rapidly calculate estimated face grades in heading to determine split fire possibilities that will reduce dilution and improve ore grade.
- **Direct Ship**
 - Using the estimated face calculations, vein structure, and previous average vein to determine if ore/waste



Split fire opportunity identified using ore/waste calculations (Lithology above sampling domains below).

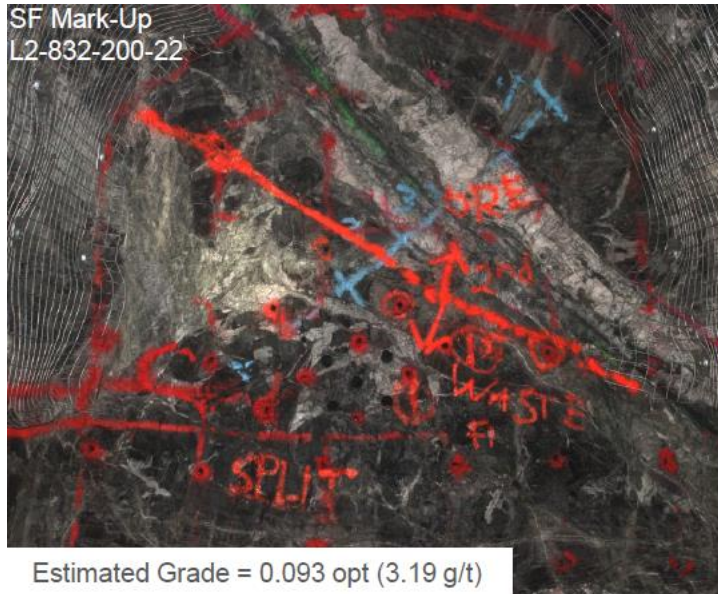


Estimation of direct shipped ore grades using accurate face calculation of proportions



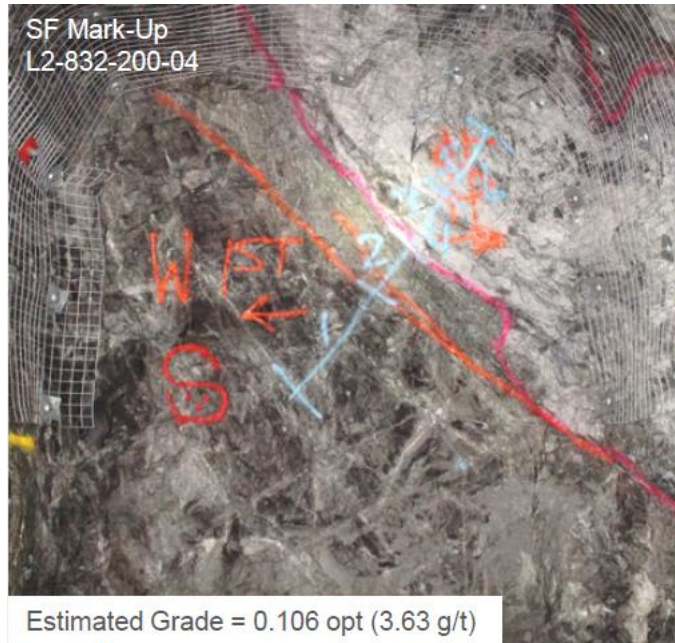
Split Fire Success

- **Turning Mineralized Waste to Ore**
 - Full face 0.048opt -> Ore shot 0.104opt
 - This work added 4412t of ore for into the June Quarter



Split Fire Success

- Increasing Grade and reducing waste – turning Ore to VHG Ore
 - Full face 0.234opt -> Ore shot 0.769opt
 - This work reduced 10922t of waste trough the mill in June Quarter

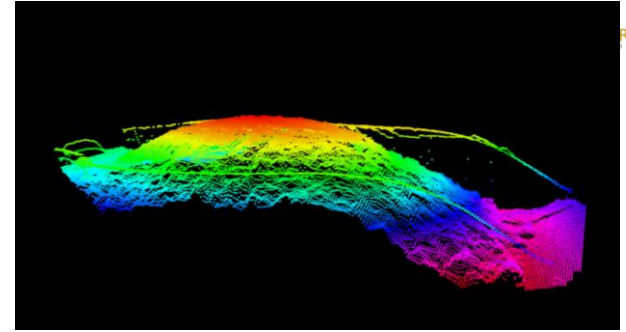




Mining Successes and Optimization

Underground Haulage

- New fleet of 6 x Epiroc MT65 dump trucks
- Commissioned May to Sept 2024
- Same geometry as TH551, additional ~13t per load (35%).
- Higher loaded uphill speed.
- Smaller fleet, same tons:
 - Less congestion.
 - Less maintenance.
- Transcale load scanner installed:
 - Payload analysis.
 - Identify carryback early.



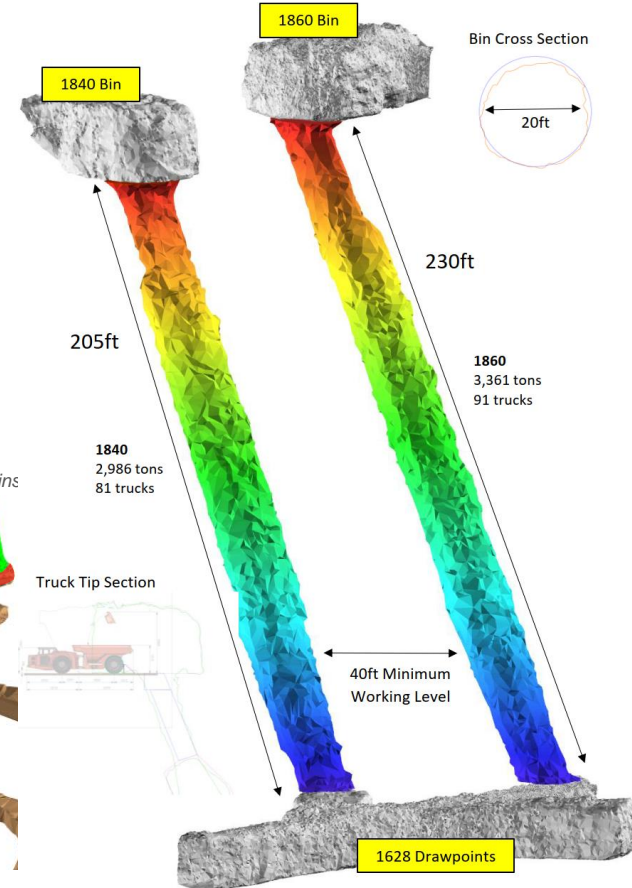
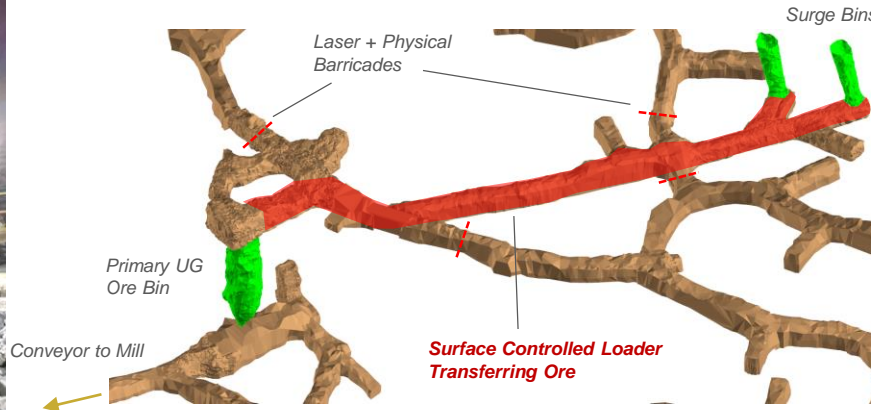
Paste Backfill System Upgrades

- Efficient paste filling critical for maintaining production rates.
- Historical issues:
 - Paste buildup in lines leading to high pressures / low pouring rates.
 - Inefficient line change-over process.
 - High risk to infrastructure in case of line blockage.
- Upgraded system includes:
 - Smaller diameter lines = higher velocity flow / less build-up
 - Automated change-over valves
 - Steel reticulation utilizing boreholes – shorter distance & removes lines from main travel way.
- Engineered paste wall kits allow faster construction & single pass stope pouring.
- Ongoing work to tailor paste blend for purpose:
 - Reduced cement costs.
 - Achieve paste strength where required
 - Ability to quickly empty mill tanks in non-critical pouring areas



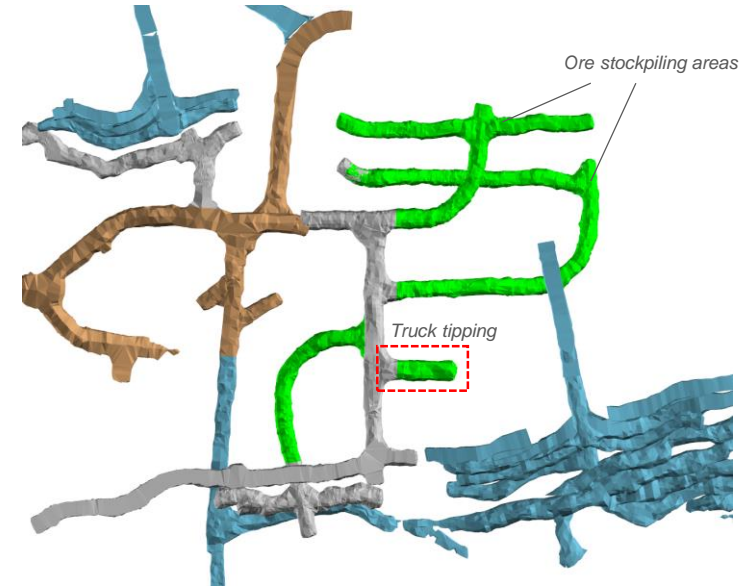
Underground Ore Delivery

- Historically no buffer:
 - Mine stops = mill stops
 - Mill stops = mine stops
- Stockpiling Capacity is Critical to decouple mine-mill.
- Surge bins provide ~7kt ore storage & opportunity for blending.
- Surface controlled remote loader & rock pick.
- Allows ore feed during blasting windows & higher mill throughput.
- Takes pressure of underground trucking fleet to 'catch-up' ore bin at beginning of shift.



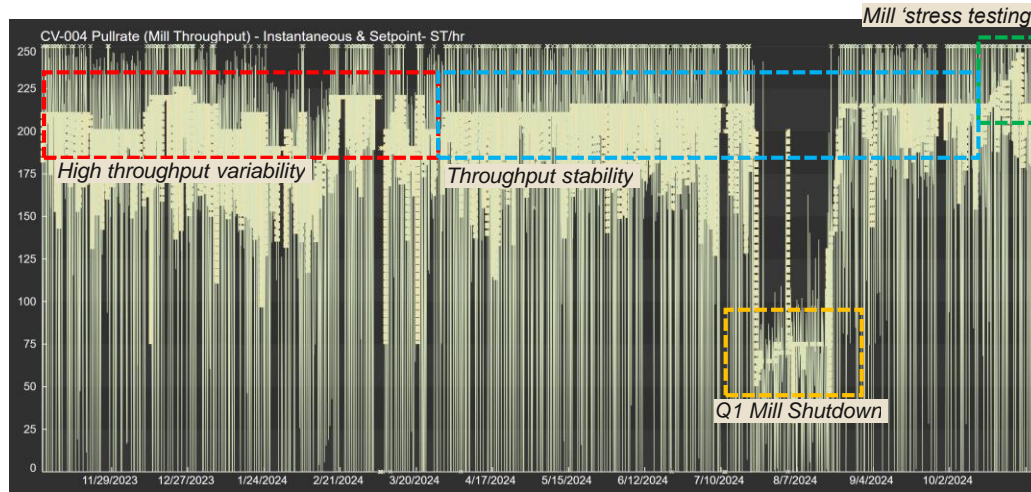
Stockpiling Strategy

- Major mill shutdown in Q1 (~1 month) – reduced throughput running SAG only through E-Feeder.
- Critical to decouple mine-mill to continue mining.
- Set up key strategic underground mining areas for ore stockpiling locations.
- Muck bays stripped to 23' high for truck tipping.
- Multiple locations established for trucking efficiency & flexibility.
- ~70kt ore stockpiled during the shut – to be used as supplemental feed through the remainder of the year.
- Demonstrated ability to continue mining in the event of a significant mill / ore feed issue (e.g. conveyor belt tear).



Forward looking mining/milling strategy

- Consistent milling rate demonstrated in FY24 Q4.
- Stress-testing mill to understand capacity, bottlenecks and required upgrades.
- High development rates driven by mining flexibility – strong focus on establishing & maintaining multiple mining fronts.
- Utilize stockpiled ore tons to supplement mined ore.
- Mining Core Drill Platforms for LOM drilling strategy.
- Increased shotcreting & capital rehabilitation to de-risk geotechnically.



Future Development – Central Veins and Goodpaster



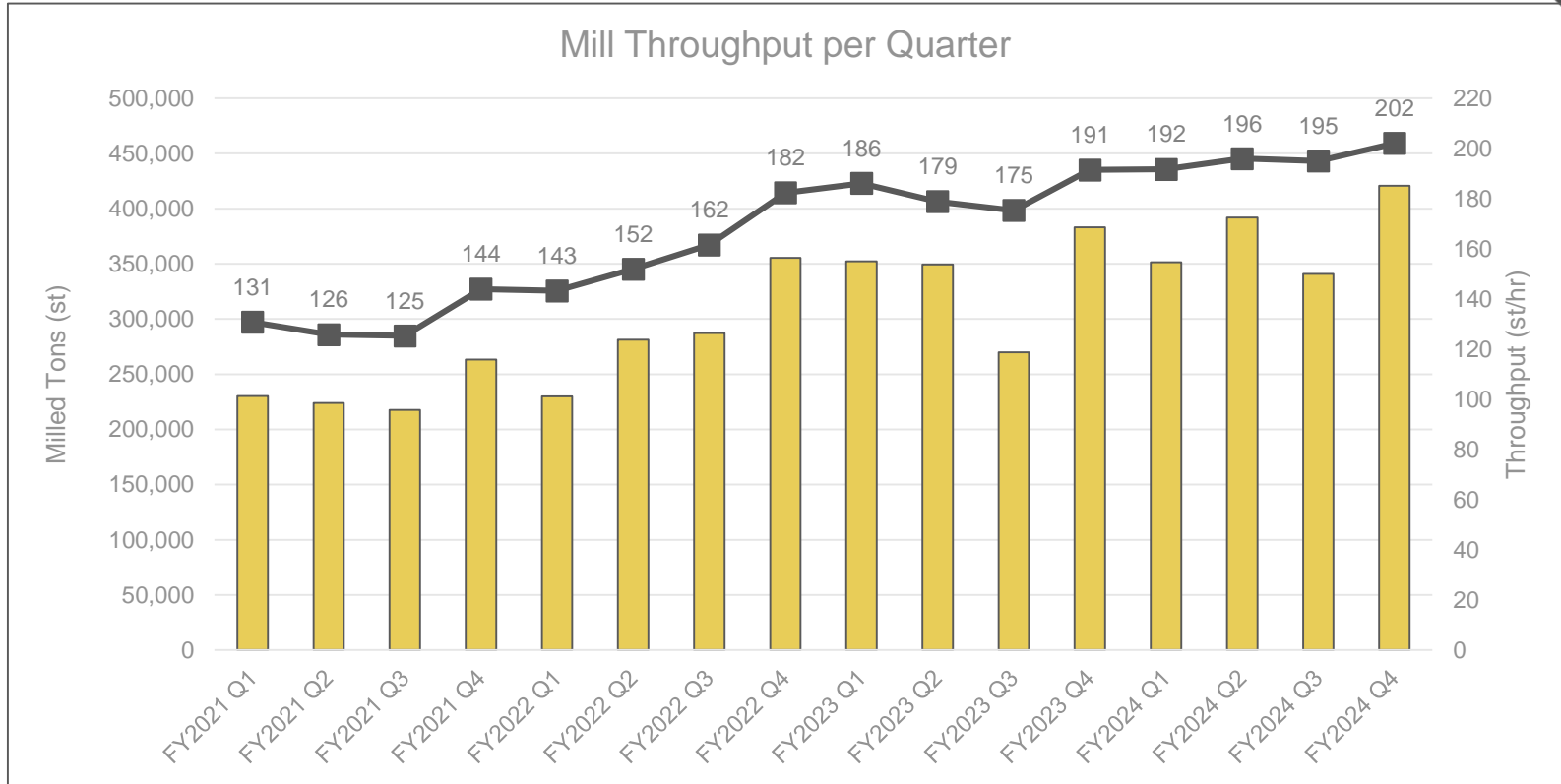


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Processing Optimization



Production History - Throughput



FY2024 – Q4 Production

- Q4 2024 Record Production at Pogo
- 1.6 Mtpa rate capacity proved
- Continued improvement – October 2024 throughput record and potential 220tph+ capacity shown

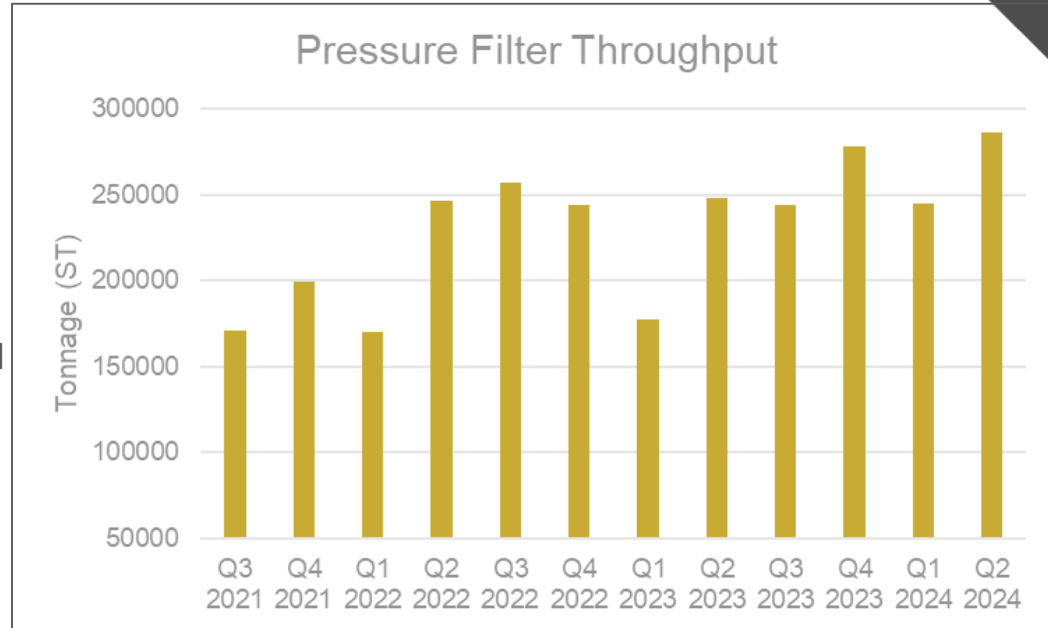
FY2024 – Q4 Performance	
Tons Processed	420,692 dst
Mill Utilization	95.4%
Gold Produced	90,819 oz

Filter Circuit Optimization

- Dry-stack Tailings – throughput bottleneck
- Filter plant operation key to overall plant utilization

Key Improvements:

- Consistent Preventative Maintenance
 - Focused, weekly, preventative maintenance – reducing unscheduled production interruptions.
- Shutdown Strategy
 - Major corrective repairs aligned with overall mill shutdown strategy.
- Operational Strategy
 - Driving down cycle times while maintaining cake moisture.



Gravity Circuit Optimization

The Problem

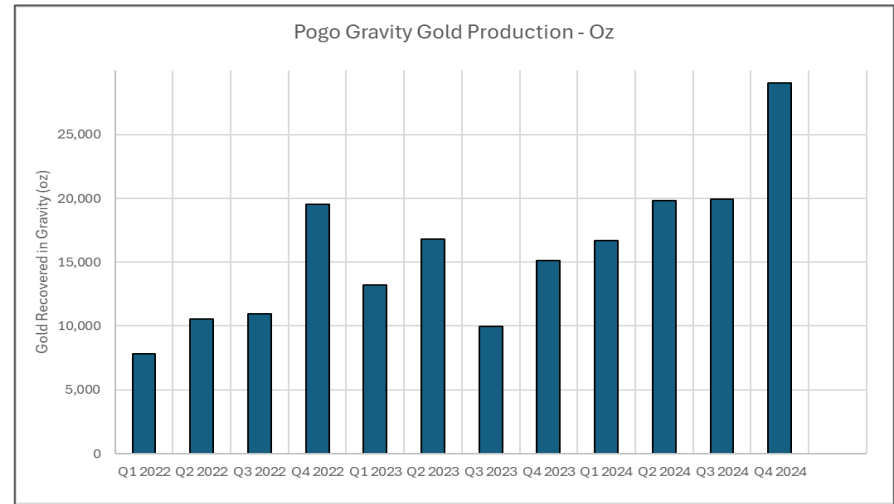
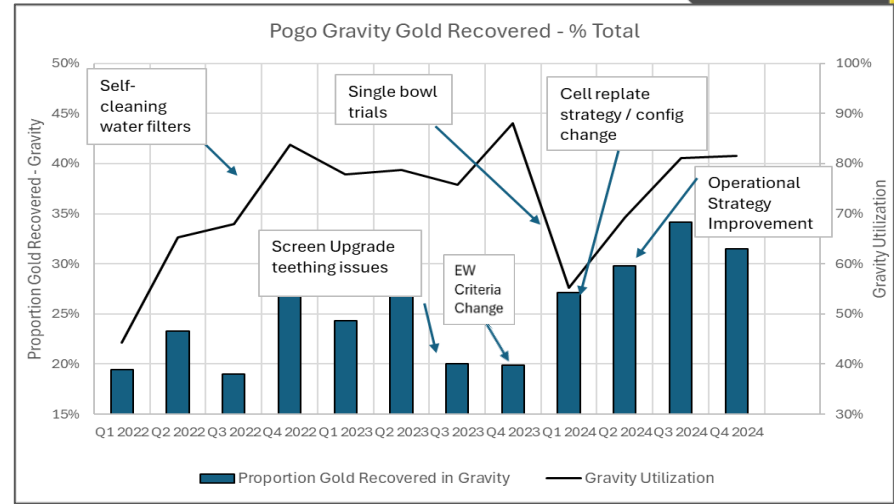
- Low gravity utilization
- Lack of circuit stability
- Slow leach and electrowinning
- Inefficient operation

The Solution

- Improve water quality
- Accelerate leaching and electrowinning
- Circuit optimization
- Streamline Operational Strategy

The Result

- 20% increase in gravity utilization
- 30% increase in proportion of gold recovered by gravity
- Quarterly gravity ounce production has doubled.



July/August Shutdown Overview

- Scope:
 - Replace damaged Ball Mill Feed End Head and Trunnion and upgrade MI-002 lubrication skid
 - Rewind Ball Mill Motor
 - Rebuild Surface Coarse Ore Bin
 - Upgrade Flotation Tails Thickener Center Well
 - Rebuild Pre-aeration Tank #2
 - Pump Upgrade Pre-work: Equip three pump boxes discharge with installed spare or full size duty standby
- Duration:
 - 28 days with BM by-passed
 - 23 days of operation with SAG in close circuit at 64 tph
 - 5 days with no feed for set up and SAG reline |

BM Head and Trunnion Changeout



- Mill is ~45yrs old
- Feed End Trunnion found cracked Sept 2023
- Lube Skid old tech
- Intensive monitoring program introduced Sept 2023 to June 2024
- Head needed to be cut due to crane constraint



Motor and Head Changeout - Grind Deck Door and Platform



BM Head and Trunnion Changeout

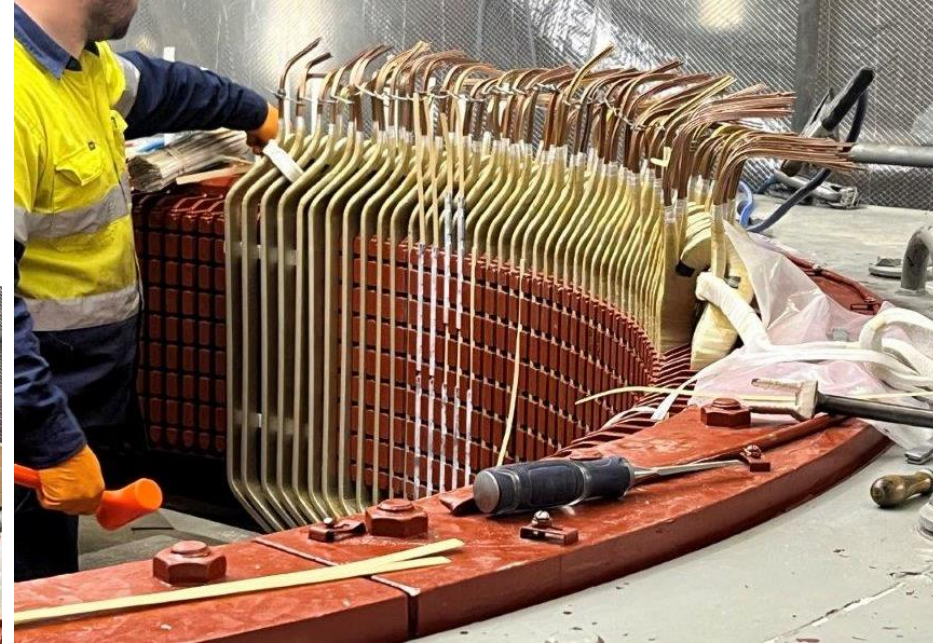


- Ordered 3-piece modular head Nov 2023
- Modular design allowed transportation by 747
- Arrived onsite April 2024
- Accessed through a door cut in the building



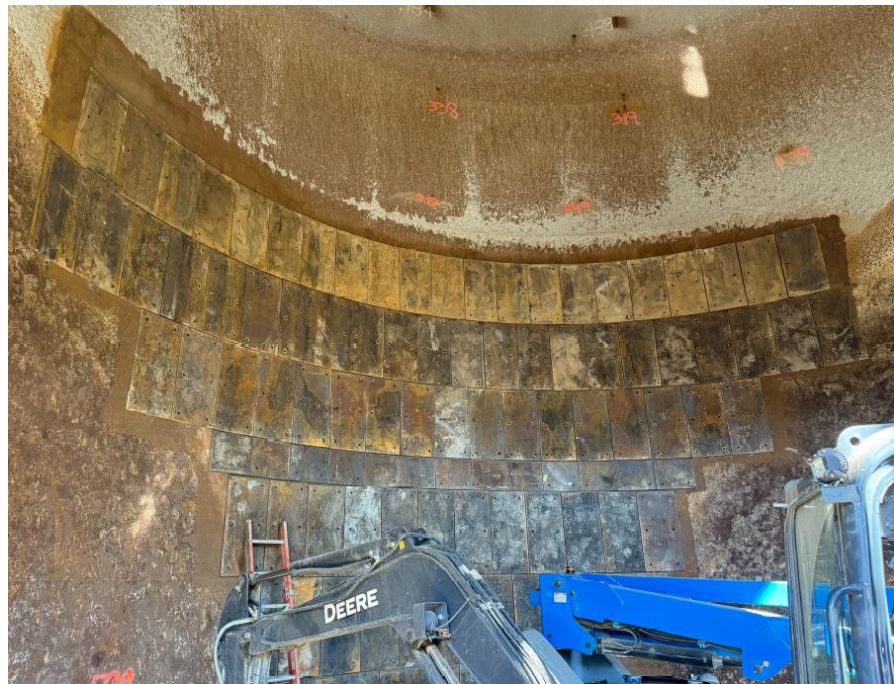
BM Motor Rewind

- Delivery of new motor delayed. Ordered June 2023. Delivered Nov 2024.
- Took opportunity to rewind motor and reduce operational risk
- Will use new motor as critical spare



Surface Coarse Ore Bin Rebuild

- Bin outer shell in poor condition
- Critical failure risk – required liner replacement



Northern Star Resources Ltd

Business First

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