

### PHOTONASSAY<sup>™</sup> SITE VISIT

CHRYSOS

Perth, 16 April 2024

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**KIM BOLAND** Chief People Officer

# Welcome & Introduction

CHRYSOS CORPORATION Assays at the speed of light

# **OUR COMMERCIALISATION JOURNEY**

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The outcome of 20+ years of research and development



# **A GROWING GLOBAL TEAM**

Chrysos' multiskilled teams work with our partners across the world

- Ever-growing talented team of over 150 people.
- Across Australia, China, Mali, Ivory Coast, Ghana, the DRC, Tanzania, Canada, USA and the UK.
- Increased deployment and sales capabilities globally.





+ Follow ...

At Intertek, every day is International Women's day #IWD2024, and this week we continue our celebration. Pictured below is our dynamic team of PhotonAssay Analysts from Ghana. These amazing women are qualified #chemists who are based at a mine site in the Ashanti Region of Ghana. They play a crucial role to our operations and they are paving the way for young females in the mining/exploration industry. We are extremely proud of them!

To read more on our PhotonAssay services visit the link below. #WomenInScience

#### https://lnkd.in/d7PYgeBd



 Investing in our R&D team to support the enhancement of our people and product capabilities.





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**Dr Naomi Potter** Technical Specialist

# PhotonAssay<sup>TM</sup> Technology Summary

CHRYSOS CORPORATION Assays at the speed of light

### **PHOTONASSAY<sup>TM</sup> OVERVIEW**

CHRYSOS CORPORATION

The industry's most innovative and valuable assaying solution



### What is PhotonAssay<sup>™</sup>?

Delivering faster, safer, and more accurate gold analysis, Chrysos PhotonAssay<sup>TM</sup> is an environmentally-friendly replacement for fire assay on-site and in the laboratory.

### How does PhotonAssay<sup>™</sup> work?

Hitting samples with high-energy X-rays, PhotonAssay<sup>™</sup> causes excitation of atomic nuclei allowing enhanced analysis of gold, silver, copper and other elements in as little as two minutes.

# **SUCCESS IN SIMPLICITY**

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Traditional methodology process compared with PhotonAssay<sup>™</sup>



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# **A GAME-CHANGING DESIGN**

Fast, safe, efficient and easy-to-operate

- Fully-automated sample handling. The operator loads and unloads samples from outside the unit.
- Electronic X-ray source: no power, no radiation.
- Radiation levels, interlocks etc. in compliance with State and National regulations.
- Samples can be safely handled, stored or disposed of after analysis.
- Minimal opportunities for human error.





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# IT'S ALL IN THE BOX

Efficient, effective and environmentally-friendly minerals analysis





### Step 2

# **READY FOR ANYTHING**

Accurate gold analysis, regardless of materials or particle sizes

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PhotonAssay<sup>™</sup> accurately measures gold regardless of the type of minerals or the size of the particles it's analysing.

### Universal calibration for:

- Moist/dry samples
- High-sulphide materials
- Carbons (granules or pulps)
- Solutions (eg plant process solutions)



# **SAFE & SUSTAINABILE**

#### Meaningful OH&S and environmental benefits

### As of 31<sup>st</sup> March 2024, Chrysos PhotonAssay<sup>™</sup> has achieved:



PhotonAssay<sup>™</sup> provides improved OH&S through the elimination of hazardous chemicals, lead exposure, and the ultra-high temperatures used in conventional fire assay.

- Fire assayers require routine testing to monitor levels of lead in their blood.
- Fire assayers are routinely rotated through other laboratory tasks to prevent a build-up of lead in their bodies.

"There is no known safe blood lead concentration; even blood lead concentrations as low as  $3.5 \ \mu g/dL$  may be associated with decreased intelligence in children, behavioural difficulties and learning problems."

WHO, Lead Poisoning - https://www.who.int/news-room/fact-sheets/detail/lead-poisoning-and-health

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# **BENEFITS THAT MATTER**

### Measurable benefits that matter to the market



	FIRE ASSAY <sup>1</sup>	PHOTONASSAY™	BENEFIT
Time per sample $\rightarrow$	Around 3 to 4 hours	Around 2 minutes	Faster, more informed decision-making. Fire assay often takes days or weeks for a sample.
Sample size $\rightarrow$	10 – 50g	400 – 650g	Enhanced data accuracy due to larger sample size
$\rm CO_2  per  sample^2 \rightarrow$	0.91kg	0.45kg	Reduced environmental footprint
Hazardous waste per sample $ ightarrow$	0.31kg	Okg	Minimised waste disposal costs, elimination of hazardous processes
Energy use per sample <sup>2</sup> $\rightarrow$	Around 1.3kWh	Around 0.65kWh	Improved ESG outcomes
Automation $\rightarrow$	No	Yes	Reduced training and staffing costs

1. Comparison of PhotonAssay<sup>®</sup> and Fire Assay per Frost & Sullivan industry report

2. Assumes same energy/electricity source is used for both methods

### **CASE STUDY: NOVO RESOURCES**

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PhotonAssay<sup>™</sup> enables more accurate minerals analysis and reporting



Schematic depiction of a typical rock sample from a coarse gold deposit, with representative fire-assay aliquots.

#### **Novo Boosts WA Gold Returns with High-Tech Sampling** Business News: 27th March, 2024.

Latest News	Resources	Property	Commercial Content

Novo Resources has boosted its recent gold drilling results by re-assaying larger sample sizes from its WA Nurvery North project, using modern high-tech multi-pot photon-assays, due to the nature of its coarse-gold. The improved results highlight several significant intersections, including 6m at more than 6 grams per tonne at the project it has in joint-venture with the Creasy Group.



### **Statements from Novo Resources**

- "Novo Resources has boosted its recent gold drilling results by re-assaying larger sample sizes from its WA Nunyerry North project, using modern high-tech multi-pot photon-assays due to the nature of its coarse-gold."
- "Initial results indicated visible coarse-gold. Fire assay sampling proved inconsistent with its results."
- "Management says the bigger 2kg crushed sample size provided a much better method to assess the average level of gold contained within each sample."
- "The final assay result was calculated as the weighted average of the pots grade and weight, resulting in larger sample sizes and more accurate assay results"



Schematic depiction of a typical rock sample from a coarse gold deposit, with representative PhotonAssay<sup>TM</sup> jars.

### **ENGAGING AT MULTIPLE TOUCHPOINTS**

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With the goal of converting mining projects to PhotonAssay<sup>™</sup>

### **Current Sample Volume Sources**



Based on over eight million samples



**Dirk Treasure** Managing Director & CEO

# **Commercial Overview**

CHRYSOS CORPORATION Assays at the speed of light

# **MISSION & STRATEGIC INITIATIVES**

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To become the world's leading provider of innovative assay services and technologies

- Convert gold mining projects to PhotonAssay<sup>™</sup> in all key mining hubs
- Focus on improved customer outcomes to drive sample volumes
- Strategic partnerships with customers that have capacity for larger unit numbers
- Comparative pricing approach for efficient market penetration
- Drive profitability & growth, with a lease model and a high return on capital
- Growth opportunities beyond gold





<sup>1.</sup> As of 22 February 2024

# **BUSINESS MODEL & ECONOMICS**

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#### A focus on the long-term

### Service and Lease Model With Tier 1 Counterparties

- Units operating commercially since 2018
- Deployed across 4 continents
- Over 8 million commercial samples processed
- Secure Long-term revenue
- Unit deployments contracted out to 2025
- Upside on revenue via increased unit utilisation
- Annual Return on Invested Capital 47% 82%
- Mosaic of technology patents protects from competition

### Partnering for Growth Sustainable and long-term

- Enabling technology with benefits beyond like-for-like
- Substantial future growth opportunities
- Mining partnerships:
  - On-site units for miners achieve maximum benefits of PhotonAssay<sup>™</sup>
- Laboratory partnerships:
  - Competitive lease model pricing structure to encourage long-term adoption
- Contracted units dominated by laboratories, but moving towards a higher proportion of mine-sites

### Samples Processed (Half Yearly)



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# **EXECUTING OUR GLOBAL ROLL OUT**

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A targeted growth strategy

### **Global Footprint**

- Now operating PhotonAssay<sup>TM</sup> on four continents
- Growing network of units in key global mining hubs
- Laying operational foundations



# **UNIT LIFECYCLE & FINANCIAL PROFILE**

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Unit economics are the underlying strength behind Chrysos' business

#### -18 Months

Long Lead Time Components ordered

#### -9 Months

- Detector station components integrated in Chrysos' Adelaide facility, including integration of the system "smarts" detectors, electronics, and software
   Heavy engineering and Linac
- Heavy engineering and Linac components manufactured by Nuctech in China
- Equipment shipped to installation site after Factory Acceptance Testing

#### 8-12 weeks

#### Key steps

- 1. Site readiness
- 2. Licensing
- 3. Cabin installation
- 4. Electrical and wiring
- 5. Integration testing
- 6. Site Acceptance Testing

#### 5+5+5+5 year lease model

#### Initial lease, renewal, recontract

- Customer partnering throughout to empower miners and laboratories to attain maximum benefit from PhotonAssay<sup>™</sup> and ensure customer satisfaction.
- PhotonAssay<sup>™</sup> becomes critical infrastructure in the mine sites on which we operate, generally becoming the preferred method for gold analysis.
- Lease model allows Chrysos to maintain the PhotonAssay<sup>™</sup> units in excellent working order throughout the lease and allows for replacement of key components in year 10 (~40% of initial capex).

#### 20 Years

#### Refurbishment or re-use Even at the point of 20 years of operation, various components of the system will remain fully usable. Offering the ability for refurbishment and re-use, balanced with obsolescence

#### Manufacturing

#### Prepayment ~A\$100,000

#### **Capital Costs**

~20% of total capex on order ~20% of total capex at Factory Acceptance Testing pre-shipping Deployment

#### Site Acceptance Testing (SAT)

~50% of total capex on SAT ~final 10% of capex paid SAT+12 months

Majority of capital payments align with revenue generation (80% of capex paid either after, or within weeks of, revenue generation)

#### Revenue

Revenue made up of Minimum Monthly Assay Payments (MMAP) and Additional Assay Charges (AAC) providing fixed guaranteed revenue as well as upside exposure to macro markets and site-by-site sample growth

#### **Operating Costs**

Operating costs ~\$450,000/annum

#### Return on Invested Capital (ROIC)

Annual ROIC of 47-82% depending on sample throughput (averaged across 49 existing contracts)

### End of life

### **FUTURE POTENTIAL OF PHOTONASSAY™**

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Unlocking further market opportunities

### **Commercially Available** Detectable Elements



Current / Core PhotonAssay<sup>™</sup> applicability and market focus.

### Near Term Development Detectable Elements



#### **Broader Potential**

- Base metals
- Rare earths
- Uranium & Thorium
- Energy metals

### **Unlocking Future Opportunities**

- Concurrent moisture
- Solution analysis



#### Dr. Naomi Potter

**Chrysos Corporation** 

Technical Specialist (Host)



### **Richard Tully**

Gold Fields

Principal Geologist: Resources & Reserves



Kim Boland Chrysos Corporation

Chief People Officer



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**CORPORATION** Assays at the speed of light

### Dirk Treasure

**Chrysos Corporation** 

Managing Director & CEO

# **Fireside Discussion**



# Thank you.

For more information, please visit **chrysoscorp.com** or contact us at **investors@chrysoscorp.com**