STRATUM AI

OXIDE CASE STUDY

AI-driven material classification unlocking 143koz of additional CIL-treatable gold and extending oxide processing life by 17 months

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CASE OVERVIEW

CONTEXT & CHALLENGE

Data inputs: ~250k meters of drillhole assays, ~510k grade control samples, ~15k meters drillholes reserved for reconciliation and multi-element geochemistry from a complex epithermal gold system. Highly variable oxidation behaviour made it difficult for traditional methods to reliably distinguish CIL-treatable material from sulphides.

AI APPROACH

AI-driven sulphur and oxidation modelling trained on multi-element assays and grade control data. The model captured complex oxide–sulphide relationships beyond conventional classification approaches.

VALUE DELIVERED

Reclassified 3.7 Mt @ 1.2 g/t Au as CIL-treatable material, identifying an additional 143 koz of gold.
Extended oxide processing life by ~17 months and supported stable 70–75 kozpa production through FY27.

DEPOSIT

OPEN PIT

Large epithermal gold complex in Papua New Guinea.

79 Au Gold

*AI-driven material classification identified 143 koz of additional CIL-treatable gold. Gross in-situ value estimated using March 2024 average gold prices.

BASELINE RECONCILIATION

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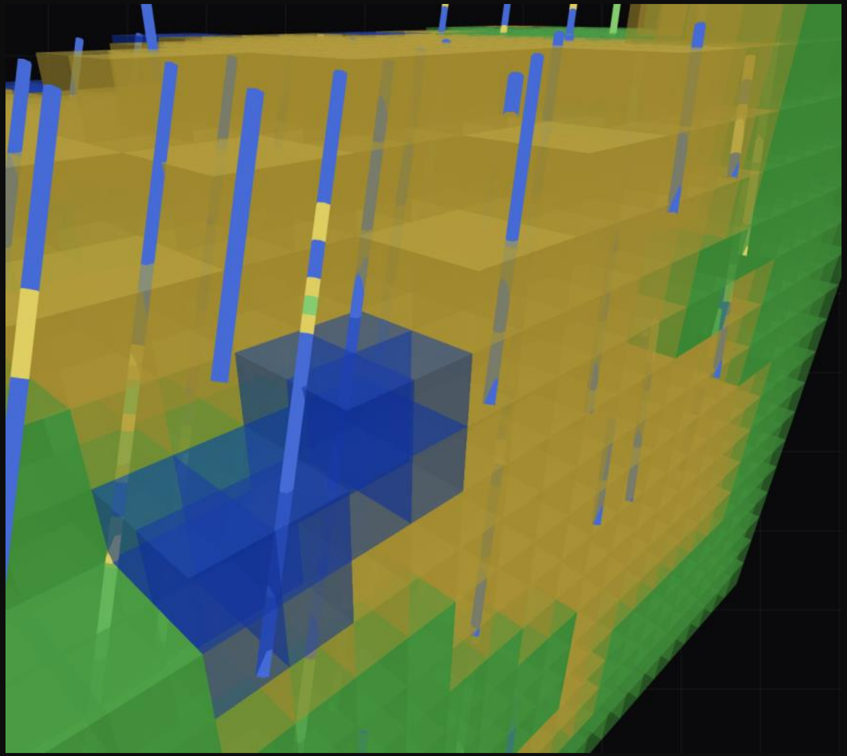
METRICS

Reconciliation was performed on a block-by-block basis by comparing each model prediction against ~15k meters of drillholes reserved exclusively for reconciliation validation. Both the Kriging and SAIGE models were evaluated against the reconciliation drillholes using two primary classification metrics: **precision and recall.**



CLASS PRECISION

Measure the probability that material predicted as oxide, transitional, or sulphide was reconciled as that class. Higher oxide precision improved recovery performance by reducing sulphide contamination sent to the oxide mill.

Where A= (O/T/S)

$$\frac{\text{A predicted A}}{(\text{S predicted A}) + (\text{T predicted A}) + (\text{O predicted A})}$$

CLASS RECALL

Measure the percentage of actual oxide, transitional, or sulphide material correctly identified by the model. Higher oxide recall reduced missed oxide material and increased oxide mill throughput.

Where A= (O/T/S)

$$\frac{\text{A predicted A}}{(\text{A predicted S}) + (\text{A predicted T}) + (\text{A predicted O})}$$

APPLIED METHODOLOGY

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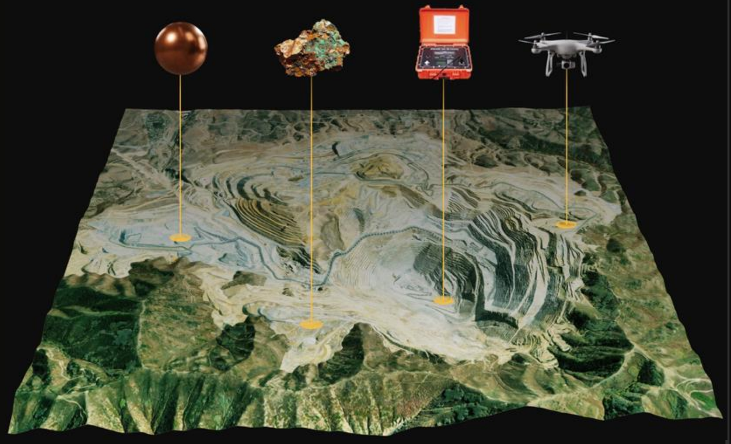
1 INPUT
Existing data

Historical, multichannel, and other unstructured data



We leverage all available data —such as metallurgy, geochemistry, geophysics, and sensor data— together with the full historical dataset of the mine

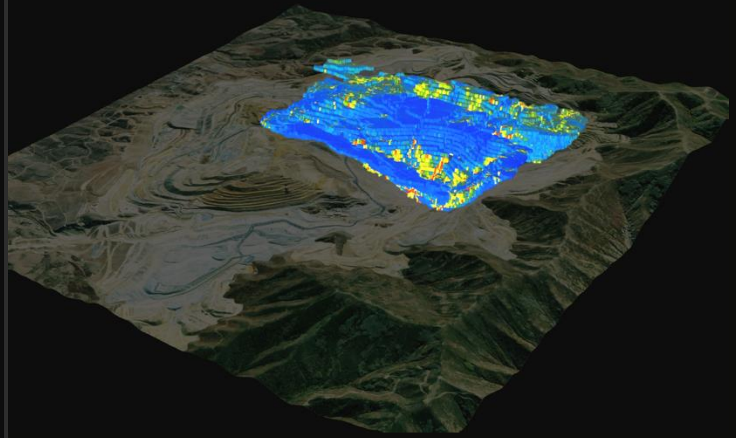
2 PROCESSING
Saige Deep Learning

AI-driven analysis and integration of complex patterns

Our AI model learns geological patterns from historical data, using a neural network trained on high-density datasets to model multivariate relationships in lower-density environments.

3 OUTPUT
AI predictive model

More accurate and comprehensive identification of mineral deposits



Identifies previously unrecognized mineralized areas, improves definition in zones with low data density, and enables continuously updated resource models that guide companies toward the most profitable locations for mineral extraction.

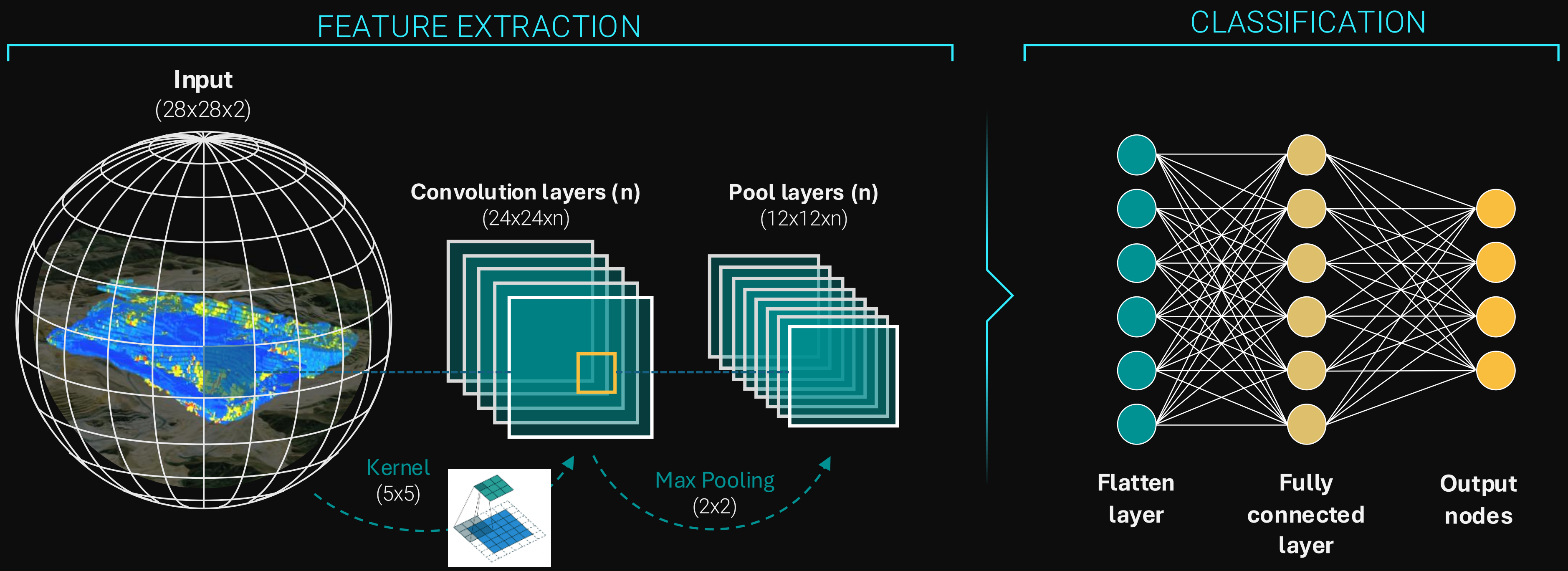
CORE ARCHITECTURE

SAIGE

Stratum AI
Geospatial Estimator

CONVOLUTIONAL NEURAL NETWORK

Deep learning algorithm that successfully captures spatial dependencies in an image through the application of relevant filters. Stratum AI model is based on this architecture, adapting it to the unique challenges of mining data.



DATA ANALYSIS

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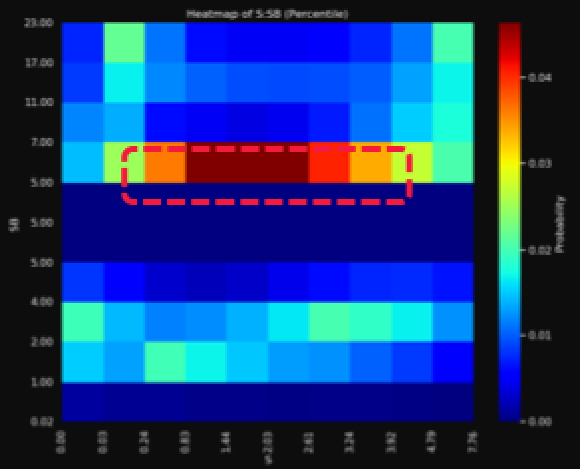
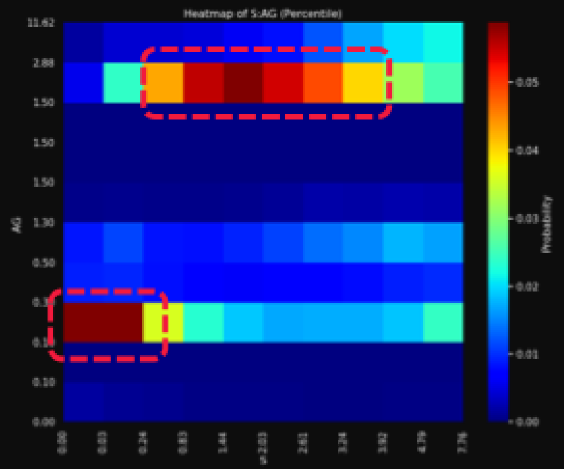
PERCENTILE SCALING



SULFUR & ANTIMONY (SB)

Non-linear correlations in transitory sulfur region



SULFUR & SILVER (AG)

Complex non-linear correlation

- Correlation analysis revealed complex non-linear relationships between sulfur and pathfinder elements such as Sb and Ag, particularly within transitional material domains where conventional approaches struggle to classify material consistently.
- Percentile-based scaling exposed distinct geochemical clusters and enhanced separability of oxidation signatures that were partially masked under conventional linear scaling.
- These multi-element relationships were incorporated into ensemble AI models combining sulfur, Sb, Ag, and additional geochemical indicators to improve material classification precision and better distinguish CIL-treatable material from sulphides.

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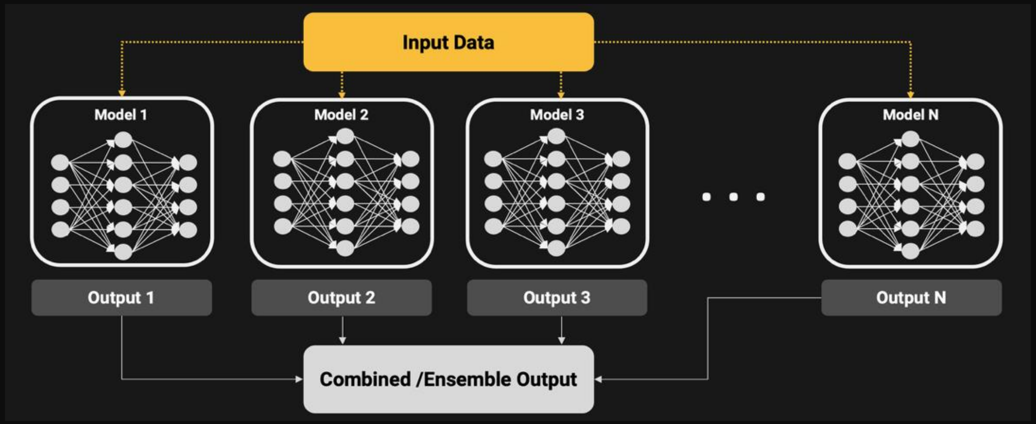
COMBINATION OF MODELS

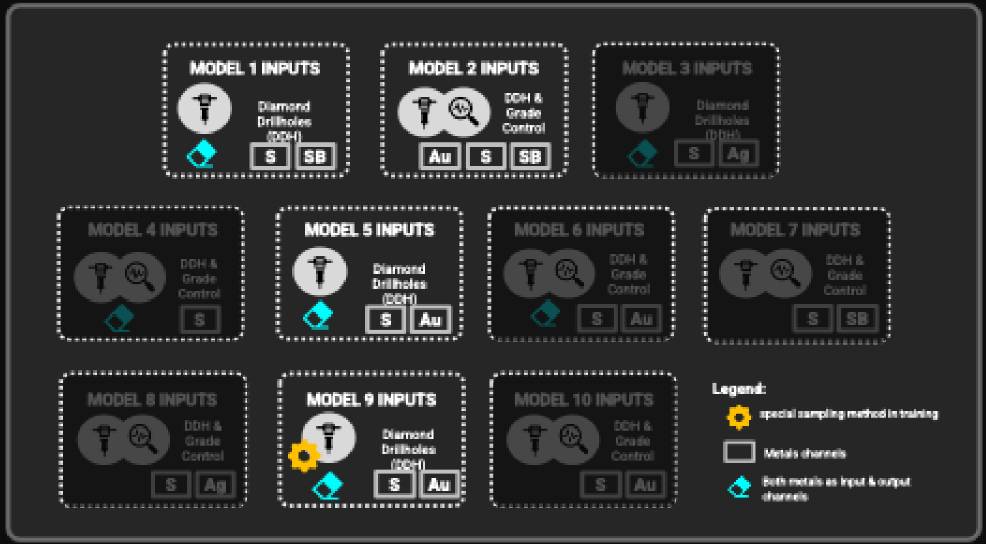
ENSEMBLE NETWORKS



Combining the outputs of multiple AI models generally creates more accurate models. We create separate models from different data inputs and then combine them through an Ensemble Network. In this analysis, the Kriging model output can be included as well.

Model used for reconciliation analysis:

ENSEMBLE NETWORKS



We build a unified ensemble of 10 AI models and the kriging baseline, selectively retaining only those that improve performance on target metrics

MODELS RESULTS

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BLOCK-WISE RESULTS

Models vs Drillholes 2020-2021		Kriging			SAIGE		
		Oxide	Trans	Sulfide	Oxide	Trans	Sulfide
Precision Predicted O/T/S that is actually O/T/S .	Blocks (%)	54.7%	20.5%	57.1%	**61.2%**	32.0%	66.4%
	MT (Koz)	10.5MT (326koz)	0.5MT (26koz)	26.3MT (1609koz)	11.7MT (374koz)	**1.6MT (90koz)**	29.1MT (1758koz)
Recall Percentage of real O/T/S successfully identified by the model.	Blocks (%)	52.2%	3.2%	82.4%	**59.1%**	10.7%	87.4%

*Percentages shown are calculated based on reconciled MT distribution within each predicted material category (Oxide, Transitional, Sulfide).

SAIGE improves the operational classification of oxide material by increasing recoverable oxides within mining areas predicted as Oxide and Transitional, while simultaneously reducing sulfide dilution in oxide feed streams.

Compared to the Kriging model, the approach **identifies an additional 2.2 MT and 109koz (+19%)** of oxide material when mining areas classified as O and T, while **reducing sulfides within predicted oxide zones by 1.9 MT (-41%)**.

The model also demonstrates stronger oxide precision and recall, improving confidence in reserve classification, material routing, and short-term processing decisions.

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KRIGING RECONCILIATION

KRIGING MODEL

Prediction vs Outcome in Reconciliation

Prediction Class	Predicted Outcome in Reconciliation Based on 2020-2021 Reconciliation		
	Oxide	Trans	Sulfide
OXIDE	54.7%	21.3%	24.0%
TRANS	40.0%	20.0%	40.0%
SULFIDE	18.7%	24.3%	57.0%

Following analysis of the Kriging reconciliation baseline, the SAIGE model was optimized around three key operational objectives: (i) Increase Oxide Recall, (ii) Increase Sulphide Recall, (iii) Increase Oxide Precision.

OBJECTIVE #1
Increase Oxide Recall

Identify missed oxide material to improve oxide mill throughput.

OBJECTIVE #2
Increase Sulphide Recall

Improve sulphide detection and reduce sulphide misclassification into oxide and transitional classes.

OBJECTIVE #3
Increase Oxide Precision

Reduce transitional and sulphide contamination within oxide feed to improve recovery performance.

SAIGE RECONCILIATION

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SAIGE MODEL

Prediction vs Outcome in Reconciliation

Prediction Class	Predicted Outcome in Reconciliation Based on 2020-2021 Reconciliation		
	Oxide	Trans	Sulfide
OXIDE	61.3%	24.6%	14.1%
TRANS	39.2%	31.4%	29.4%
SULFIDE	13.9%	19.6%	66.4%

*Percentages shown are calculated based on reconciled MT distribution within each predicted material category (Oxide, Transitional, Sulfide).

OBJECTIVE #1
Increase Oxide Recall

29.1% Less Oxide in Sulfide Class *

OBJECTIVE #2
Increase Sulphide Recall

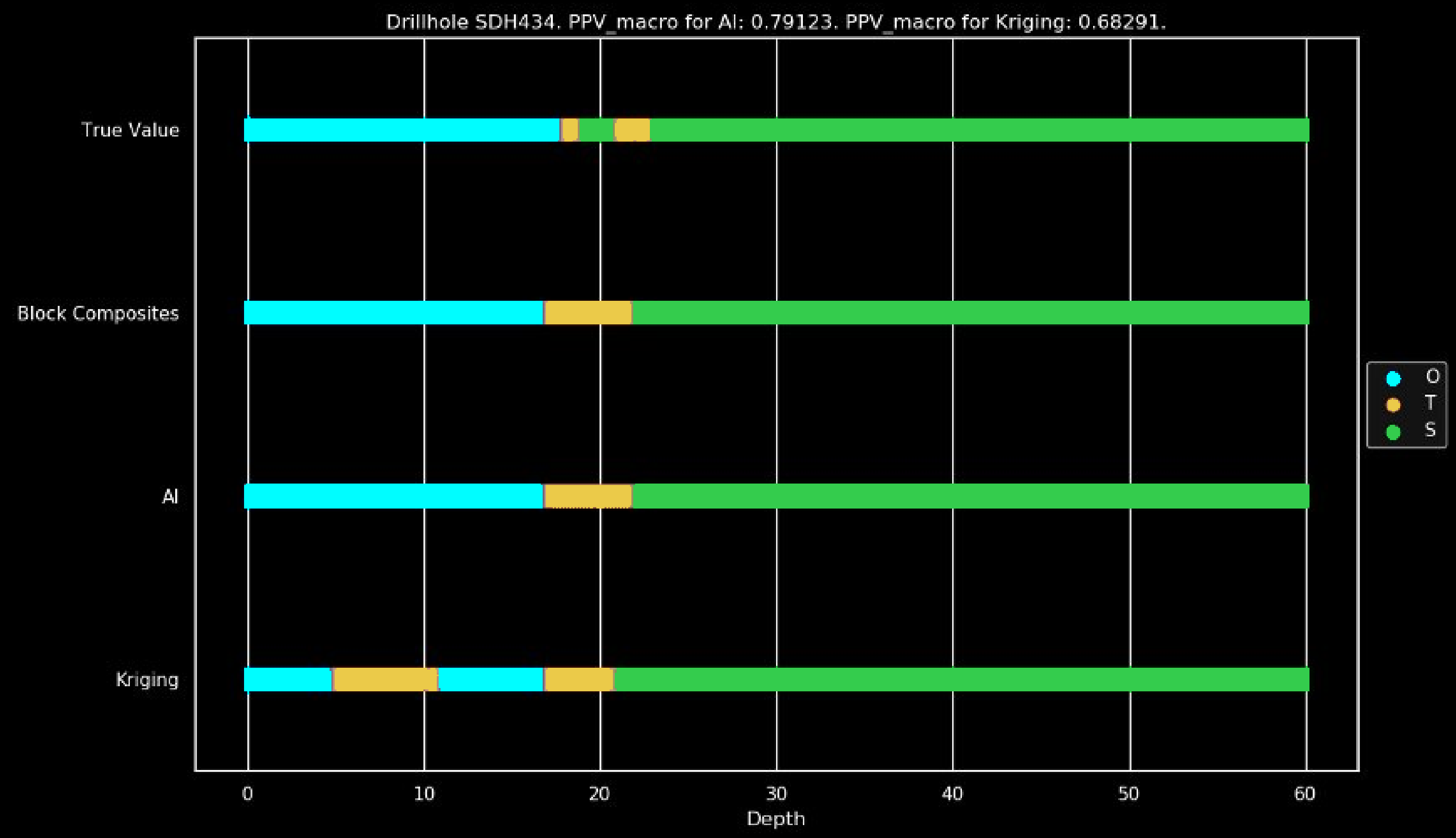
41.3% Less Sulfide in Oxide Class*

OBJECTIVE #3
Increase Oxide Precision

11.4% More Oxide in Oxide class*

DRILLHOLE INSPECTION

DDH: SDH434



	SAIGE	Kriging
O Precision	100.0%	100.0%
T Precision	40.0%	10.0%
S Precision	97.4%	94.9%
PPV Macro	79.1%	68.3%

DRILLHOLE INSPECTION

DDH: SRCH48

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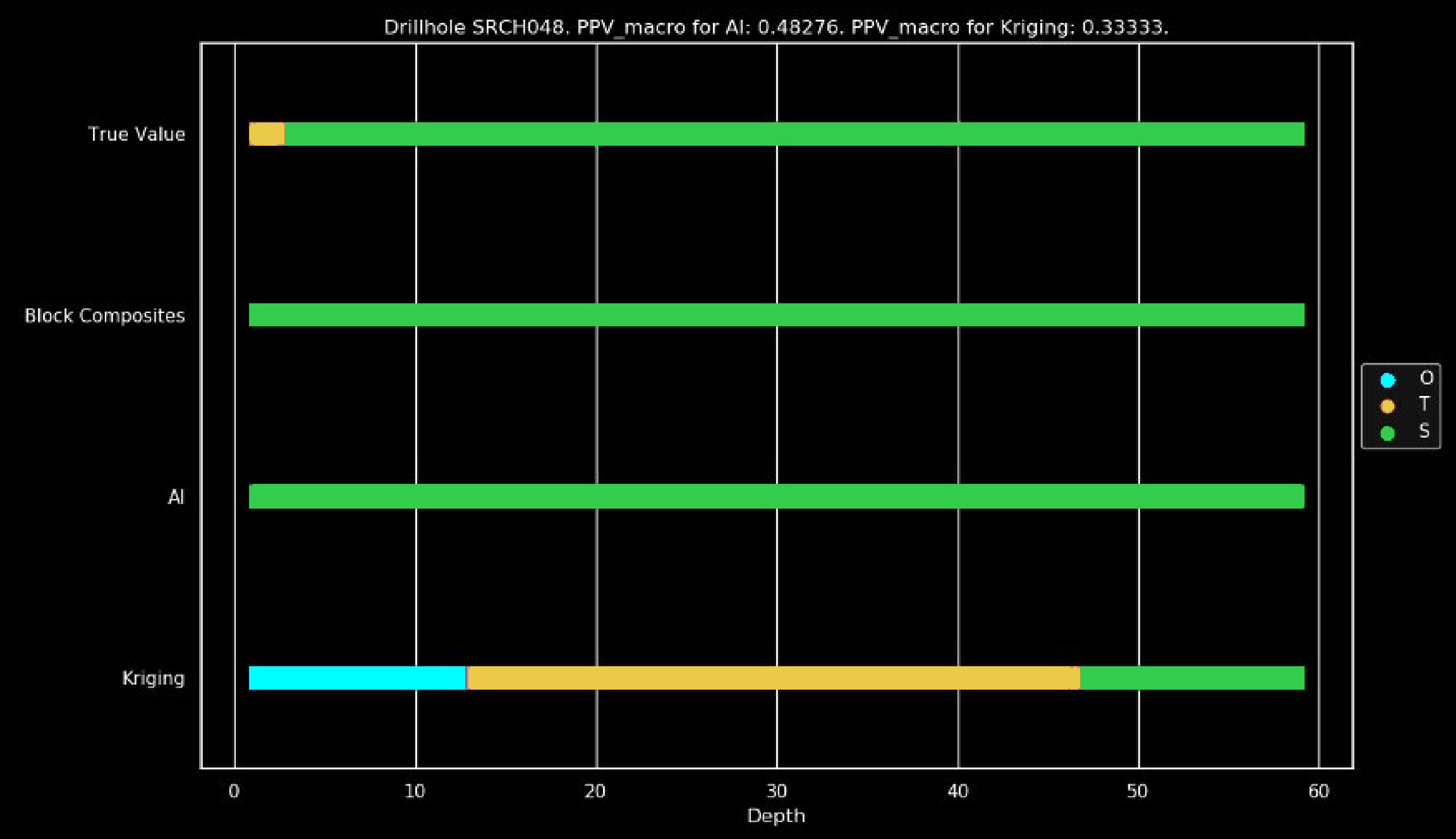
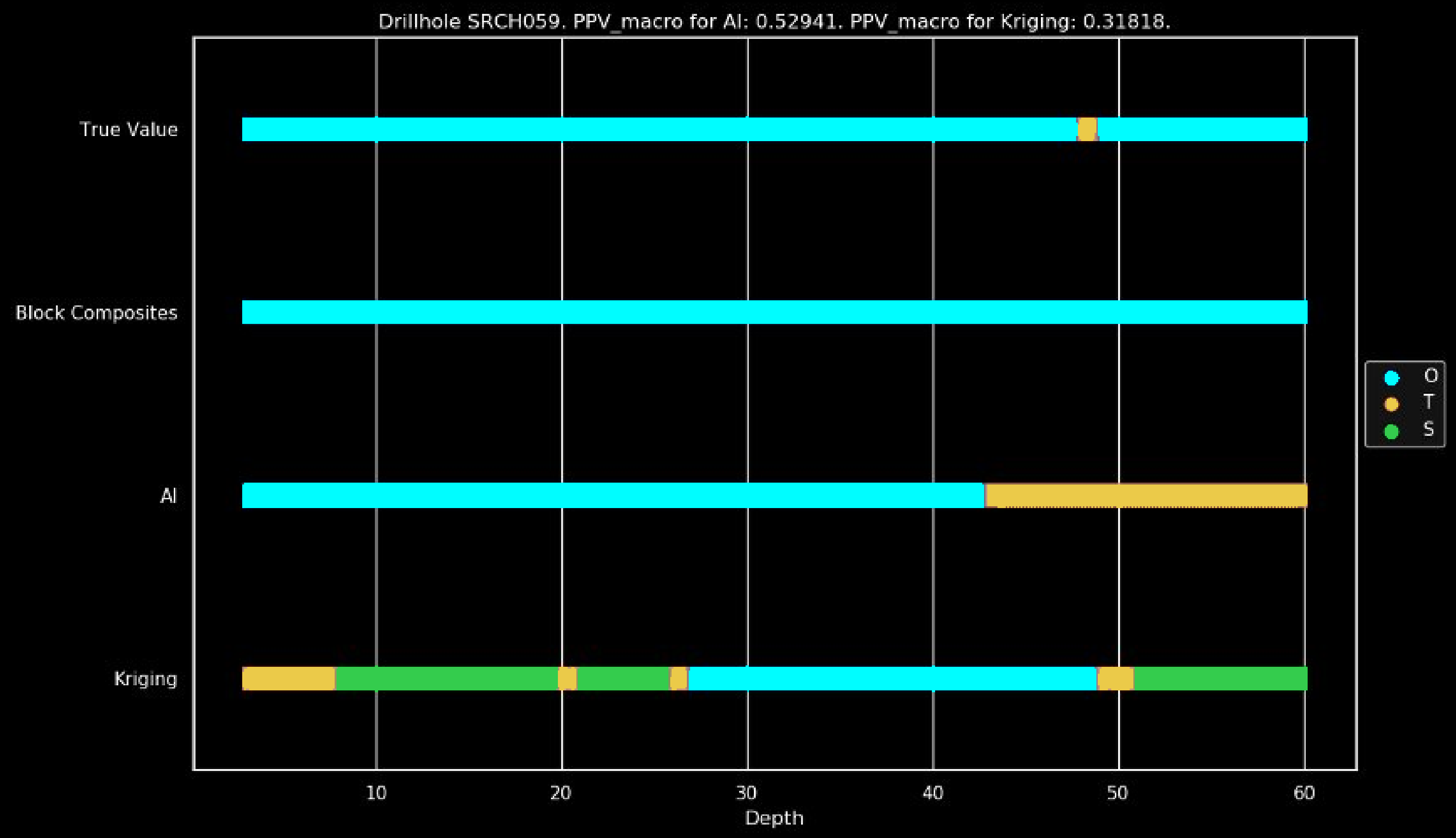


	SAIGE	Kriging
O Precision	100.0%	0.0%
T Precision	N/A	0.0%
S Precision	96.6%	100.0%
PPV Macro	48.3%	33.3%

DRILLHOLE INSPECTION

DDH: SRCH59



	SAIGE	Kriging
O Precision	100.0%	95.0%
T Precision	5.8%	0.0%
S Precision	100.0%	0.0%
PPV Macro	52.9%	31.8%

VISUAL INSPECTION

ZONE #1: 175SRGC728

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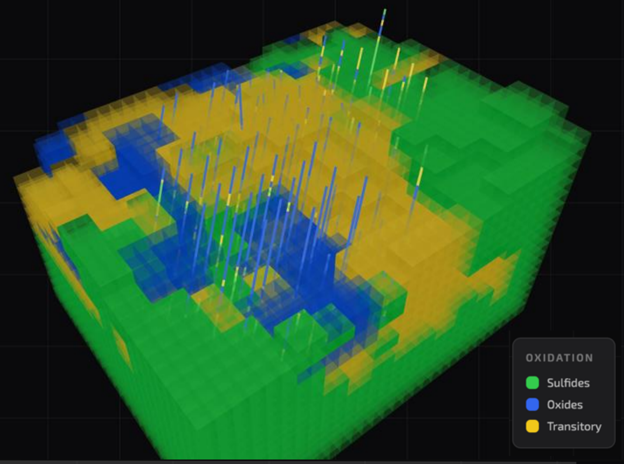
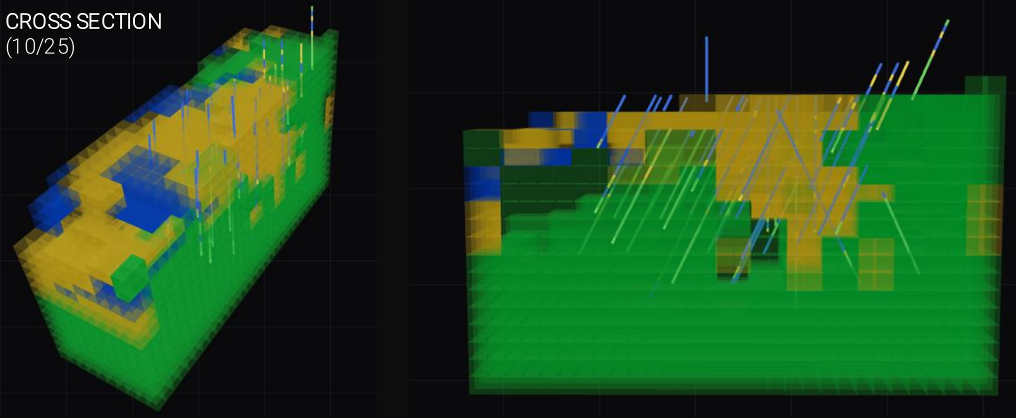
KRIGING

ZONE #1

Kriging classifies much of this area as transitional material, despite reconciliation drillholes indicating oxide continuity.



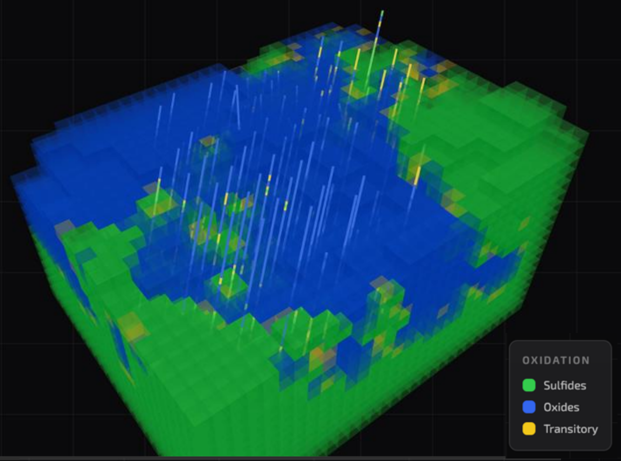
CROSS SECTION
(10/25)



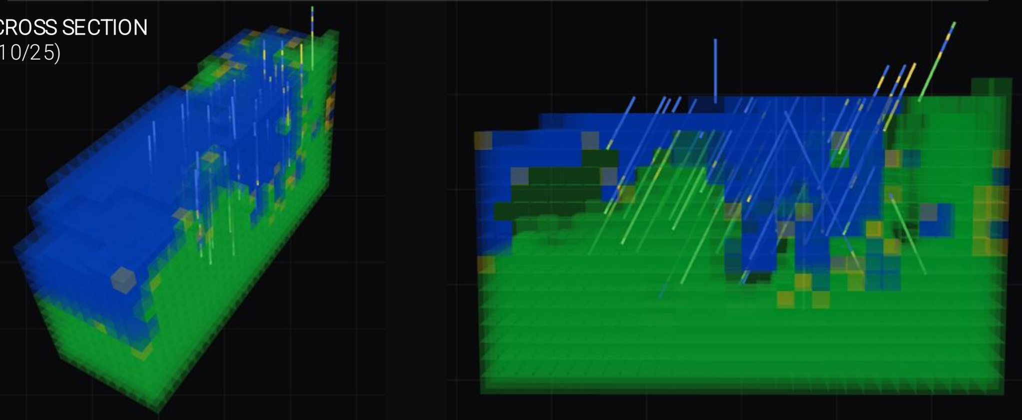
SAIGE

ZONE #1

SAIGE correctly captures the oxide continuity observed in reconciliation drillholes, resulting in higher oxide recall.



CROSS SECTION
(10/25)



VISUAL INSPECTION

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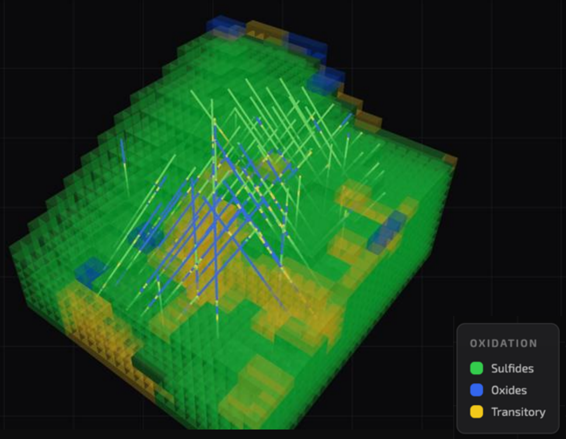
ZONE #2: 160MNGC066

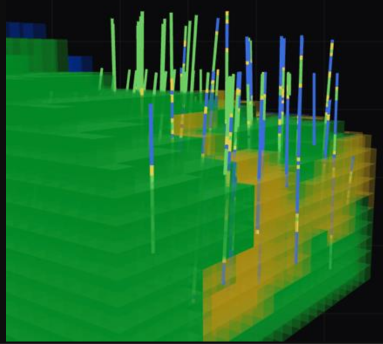
KRIGING

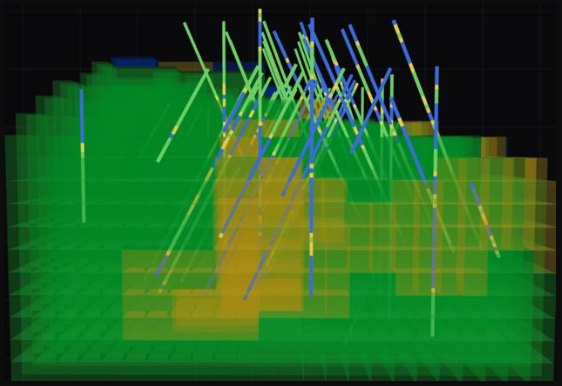
ZONE #2

The Kriging model underrepresents this oxide zone, classifying portions of it as transitional material.



CROSS SECTION
(18/27)

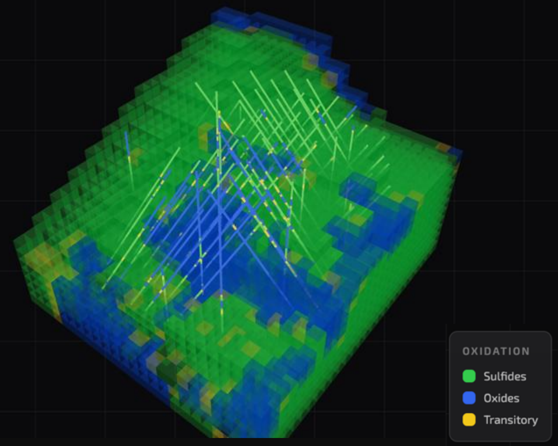




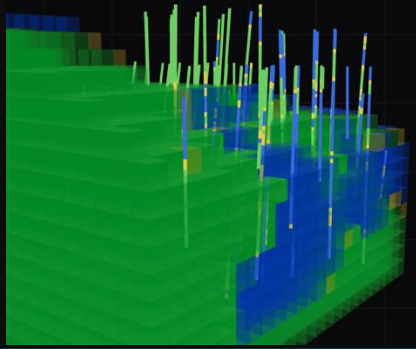
SAIGE

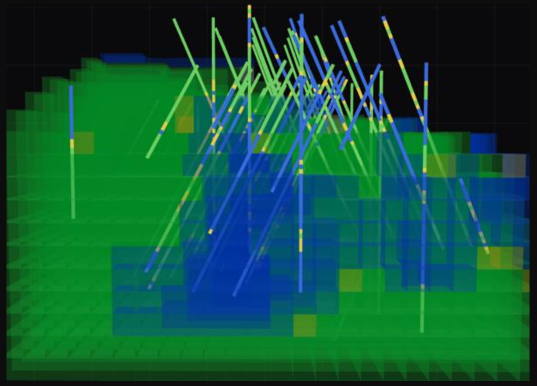
ZONE #2

SAIGE better identifies the oxide domain, aligning more closely with reconciliation drillholes.



CROSS SECTION
(18/27)





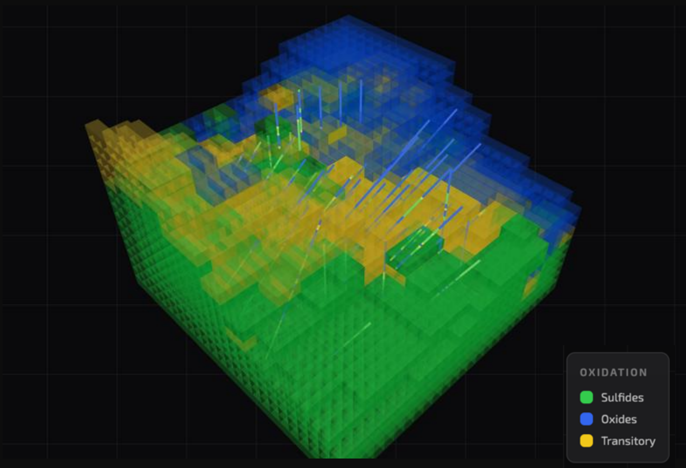
VISUAL INSPECTION

ZONE #3: 170SRGC323

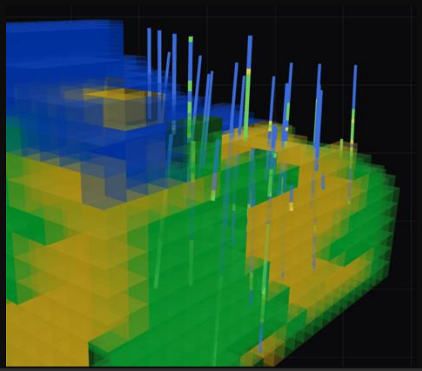
KRIGING

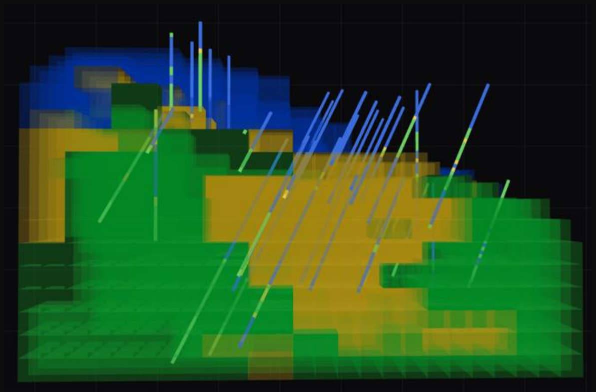
ZONE #3

Kriging leaves part of the oxide mineralization classified as transition material.



CROSS SECTION
(18/27)

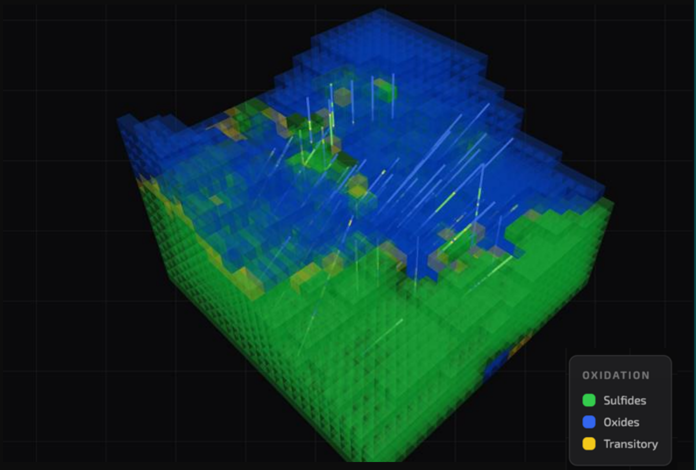




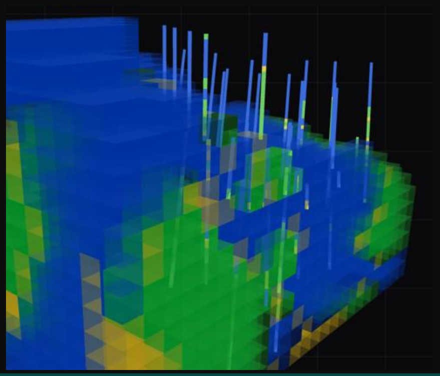
SAIGE

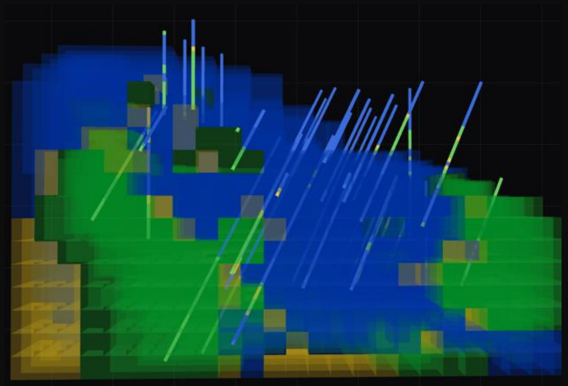
ZONE #3

SAIGE more consistently predicts the oxide zone indicated by reconciliation drilling.



CROSS SECTION
(18/27)

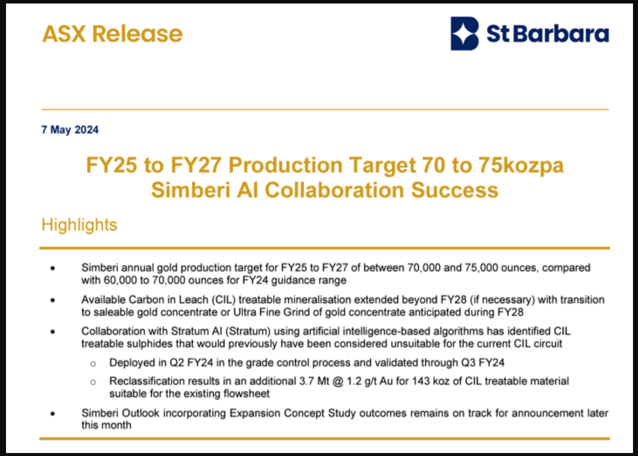




SAIGE MODEL RESULTS

The following sections present the results of the developed case study, along with outcomes observed during the deployment phase of the model.

These results are aligned with the operational validation and production impacts referenced in the Simberi Mine public report released on May 7, 2024, including the identification of additional CIL-treatable sulphide material through the deployment of Stratum AI's artificial intelligence-based workflows.



ASX Release

St Barbara

7 May 2024

FY25 to FY27 Production Target 70 to 75kozpa
Simberi AI Collaboration Success

Highlights

- Simberi annual gold production target for FY25 to FY27 of between 70,000 and 75,000 ounces, compared with 60,000 to 70,000 ounces for FY24 guidance range
- Available Carbon in Leach (CIL) treatable mineralisation extended beyond FY28 (if necessary) with transition to saleable gold concentrate or Ultra Fine Grind of gold concentrate anticipated during FY28
- Collaboration with Stratum AI (Stratum) using artificial intelligence-based algorithms has identified CIL treatable sulphides that would previously have been considered unsuitable for the current CIL circuit
    - Deployed in Q2 FY24 in the grade control process and validated through Q3 FY24
    - Reclassification results in an additional 3.7 Mt @ 1.2 g/t Au for 143 koz of CIL treatable material suitable for the existing flowsheet
- Simberi Outlook incorporating Expansion Concept Study outcomes remains on track for announcement later this month

CASE STUDY RESULTS (2022)

+2.2 MT	**+109koz**	**-29%**	**-41%**
reclassified as Oxide Material (CIL treatable)	Additional gold ounces for CIL processing	Less Oxide in Sulfide Class	Less Sulfide in Oxide Class

DEPLOYMENT FASE RESULTS (2024*)

+3.7 MT	**+143koz**	**+10%**	**+17mo**
@ 1.2 g/t Au reclassified as CIL treatable	Additional gold ounces for CIL processing	Increased production target of 70–75 koz.	Extension of oxide processing life

*Presented in accordance with the JORC Standard

STRATUM AI

OXIDE CASE STUDY

AI-driven material classification unlocking 143koz of additional CIL-treatable gold and extending oxide processing life by 17 months