

# BUNDARRA PORPHYRY EXPLORATION

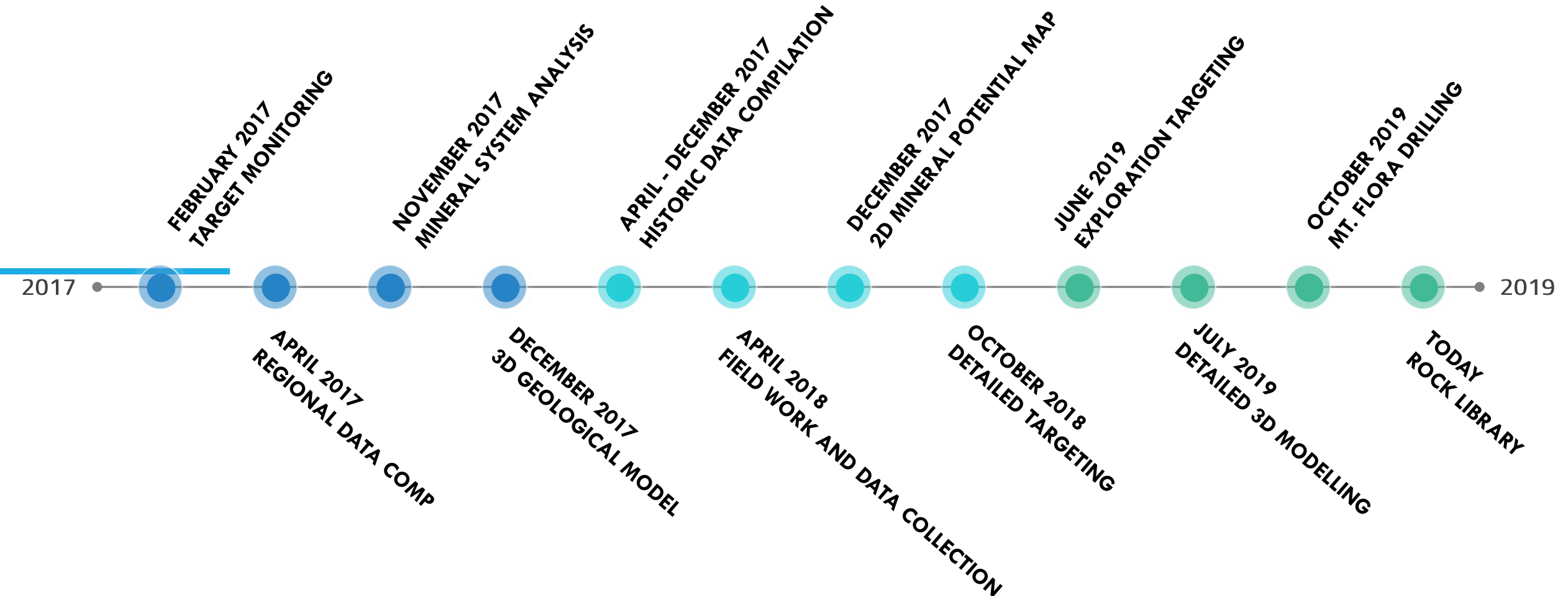
Case Study

**Kenex**



# The Bundarra Timeline

A roadmap of one of Kenex most successful exploration targeting projects



# TARGET MONITORING

The Bundarra project was identified during Kenex's monthly targeting process.  
The monitoring involves:

**01** Search Kenex's global model target and mineral occurrence databases for commodities of interest.

**02** Filter targets to only select ones on free ground or in moratorium, outside restricted areas and with a status change in the previous month.

**03** Undertake a brief target review for each individual target. Including reviewing available data and published reports from previous holders.

**04** Detailed review of promising targets that haven't been properly explored or have been relinquished for reasons other than their prospectivity.

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## BUNDARRA TARGET

Bundarra stood out as having significant upside potential due to the many prospects (including old mines) surrounding the granodiorite intrusion, significant historic Cu and Au drill intersections and trench samples, and the lack of follow-up on encouraging results.

After detailed review a tenement application was lodged in March 2017, and was granted in January 2018.

The project is now 100% owned by Duke Exploration with Kenex providing technical support.



## REGIONAL DATA COMPILATION

Undertaken concurrently with the Mineral System Analysis, the regional data compilation consisted of obtaining and compiling all available open file geoscience data provided by the Geological Survey of Queensland and Geoscience Australia and sourcing any additional information.

All compiled data underwent a QA/QC process to find any errors or inconsistencies, and these issues were corrected prior to any further work being undertaken.

The geoscience datasets were compiled into an exploration GIS with a consistent file and folder structure and all GIS files in the same projection.

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Data to be used for  
regional 2D Mineral  
Potential Mapping and  
Targeting and further  
project assessment



# MINERAL SYSTEM ANALYSIS

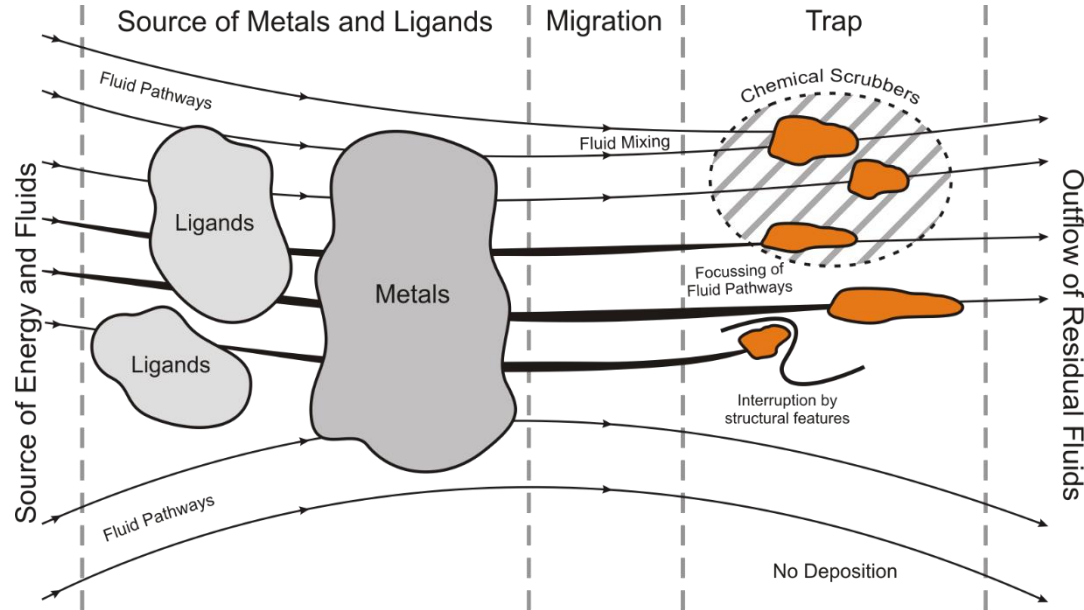
## Understand

Study and review the mineral system being targeted



## Constrain

Constrain the mineral system and determine the key predictive variables to be mapped



## Data

Ensure all data required to map predictive variables is identified and available



## Discuss

Through communication with Duke Exploration at critical decision-making stages



## Spatial Data Table

A spatial data table was developed to list all the potential predictive maps required to map the components of the mineral system.

The spatial data table is an important document for recording information about how each predictive map relates to the mineral system.



# REGIONAL-SCALE 2D MINERAL POTENTIAL MAPPING

## Defining porphyry targets in Central Queensland

The data-driven weights of evidence technique was used to map the potential for porphyry mineralisation in Central Queensland.

This technique allows for the identification of prospective areas based on a thorough analysis of all available spatial data relating to known porphyry mineral occurrence locations.

Predictive maps are generated and tested against the training data as proxies for the different components of the mineral system (source, transport, trap, and deposition).

The priority maps were selected for inclusion in the final mineral potential model, ensuring that at least one map was selected to represent each component of the mineral system.

The spatial analysis component of the mineral potential mapping helped to identify the key predictors for porphyry mineralisation at a regional scale.

Several highly prospective regional scale target areas were identified that have potential for porphyry mineralisation.

**Bundarra was highlighted as the highest ranked target within the Central Queensland study area confirming its potential for significant mineralisation.**



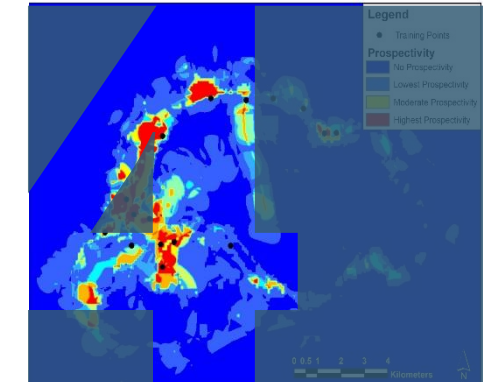
CHOOSE STUDY AREA



CREATE MAPS



WEIGHT MAPS



RUN THE MODEL



CREATE GIS PACKAGE



CREATE/RANK TARGETS



# HISTORIC DATA COMPILATION

Detailed data compilation over the Bundarra tenement area

The detailed historic data compilation initially involved researching and obtaining all open-file company reports and government websites to determine the data that needed to be collected and included in the exploration GIS package.



The data was compiled and integrated with the most up to date data from existing Kenex databases. The compilation includes drill hole locations and downhole data, surface geochemistry, detailed geology maps and geophysical surveys.



A QA/QC process was undertaken on the compiled data that included drill hole validation in Micromine, validation of surface geochemistry in ioGas, and checking for attribute and geometry errors in the geological maps.



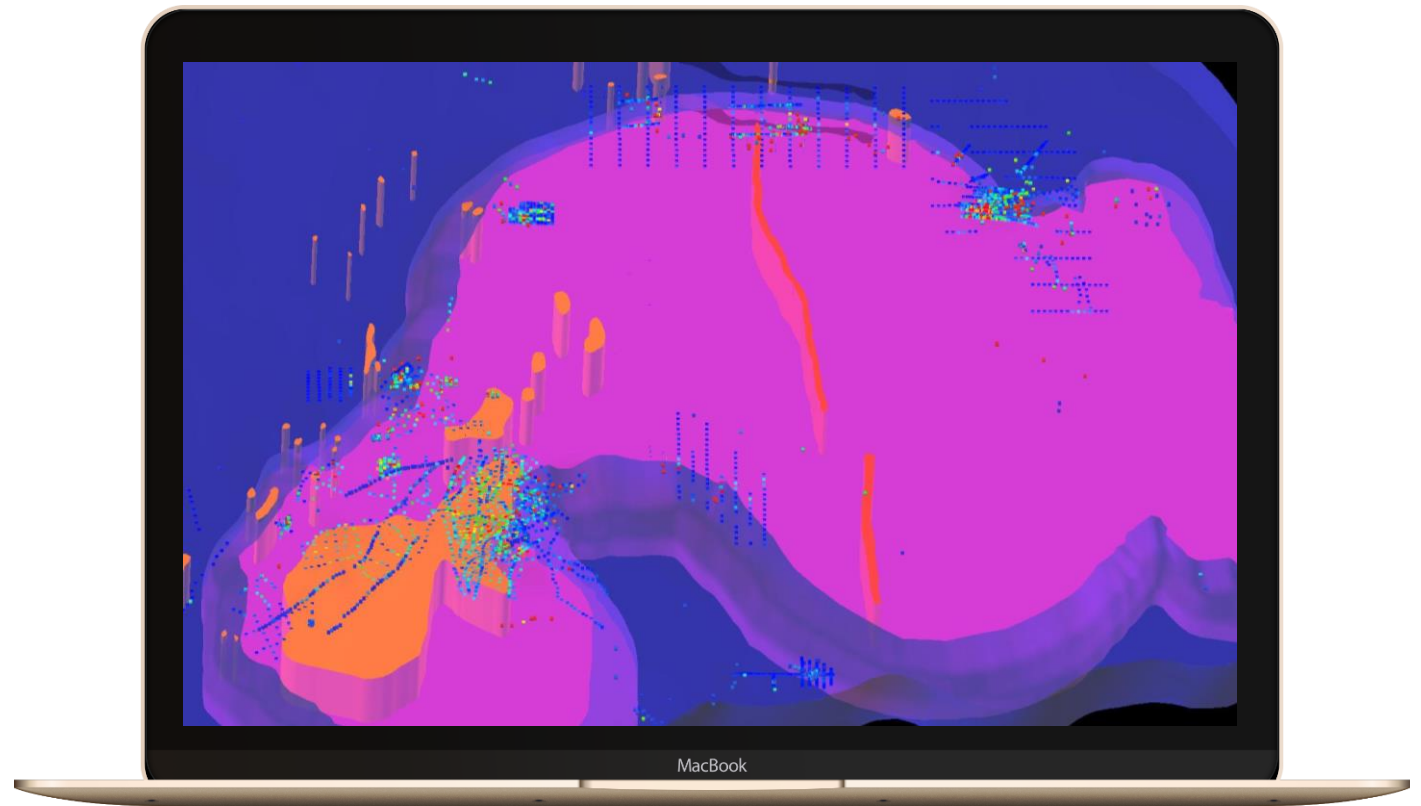
The verified compiled datasets were included in an exploration GIS and delivered with a detailed report about the compilation and recommendations for further studies to be undertaken, in line with the work programs submitted with the tenement application.





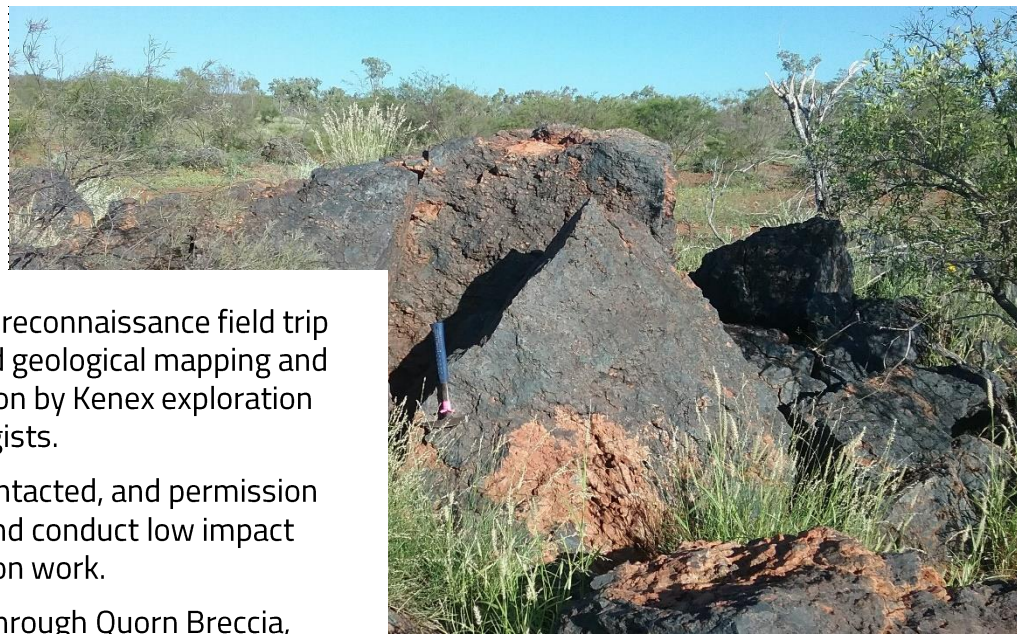
# TENEMENT-SCALE 3D MODELLING

- ✓ Using the updated data compilation, a regional-scale 3D geological map was developed over the Bundarra tenement area.
- ✓ This was created in GoCad, primarily to visualise the geometry of the contact between the Bundarra Intrusive Complex and the host sedimentary rocks.
- ✓ The contact was constrained by maps of the contact surface location, drill intersections, and descriptions of the contact geometry at surface.





# FIELDWORK



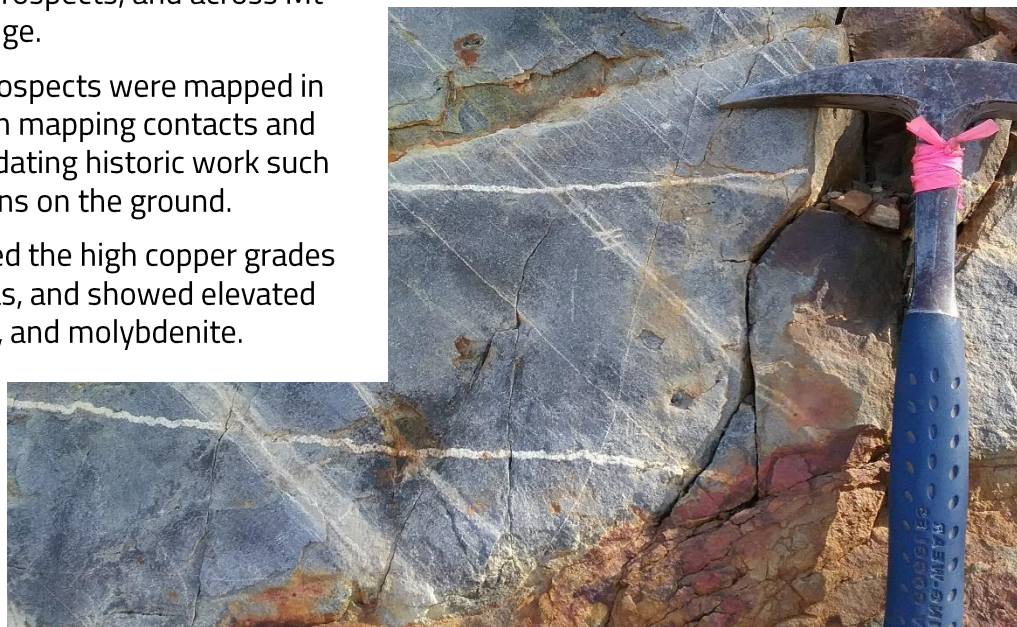
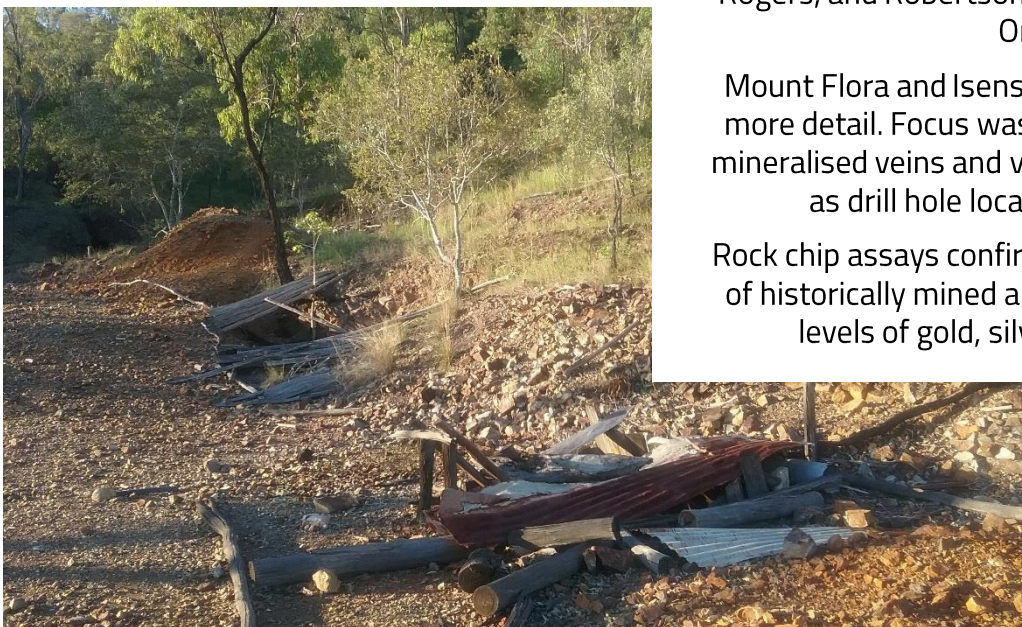
Based on the 3D model, a reconnaissance field trip was planned, and involved geological mapping and rock chip sample collection by Kenex exploration geologists.

Two landowners were contacted, and permission was granted to enter and conduct low impact exploration work.

Traverses were made through Quorn Breccia, Rogers, and Robertsons prospects, and across Mt Orange.

Mount Flora and Isens prospects were mapped in more detail. Focus was on mapping contacts and mineralised veins and validating historic work such as drill hole locations on the ground.

Rock chip assays confirmed the high copper grades of historically mined areas, and showed elevated levels of gold, silver, and molybdenite.





# DETAILED 2D MINERAL POTENTIAL MAPPING

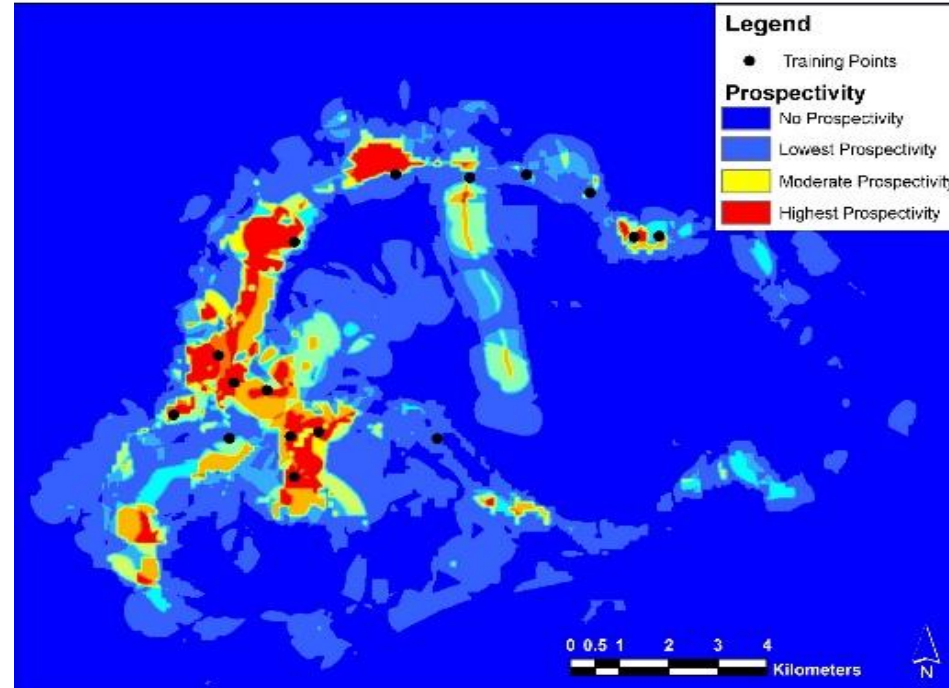
## Refining the mineral potential mapping results and targets for Bundarra

Using the updated data compilation, new understanding from the 3D model, and the newly acquired field data, a detailed mineral potential map was produced over the Bundarra tenement area.

The aim was to produce refined exploration targets that could be prioritised for follow up exploration and development detailed 3D targeting models.

Based on the mineral potential mapping results and new information collected during the detailed data compilation Mt Flora was prioritised for detailed 3D modelling and drill planning.

The mineral potential mapping will be updated and targets refined when new data is collected.

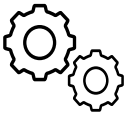


# DETAILED 3D MAPPING OF MINE SHAFTS AND MINERALISED LODES AT MT FLORA



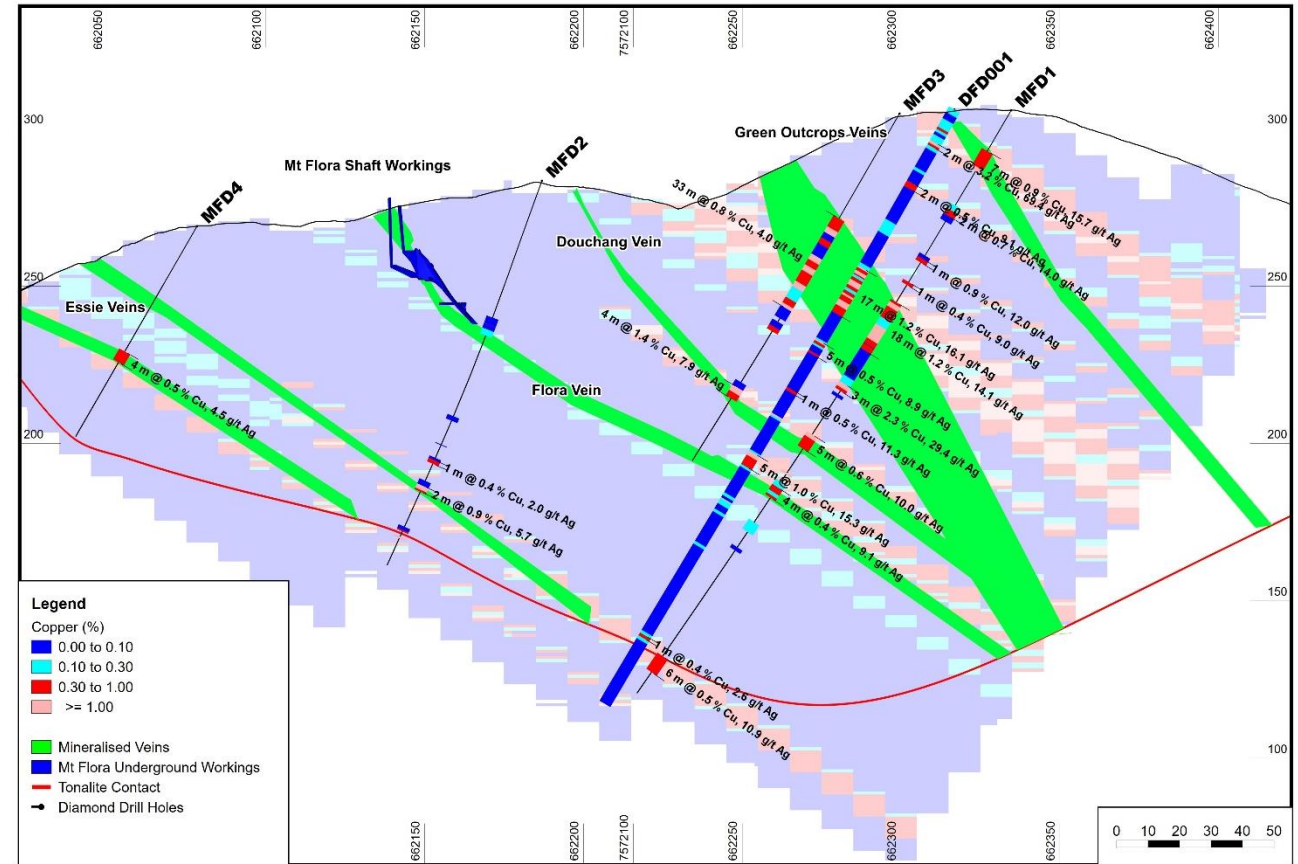
## DATA ACQUISITION

In order to create the 3D model and mine layout, all available drill holes, lithology logs and assays were compiled in a Micromine database and a suitable Digital Elevation Model was acquired over the Mt Flora project area.



## PROCESSING

The mine shaft and drives at Mt Flora were digitized from historic plans and cross sections in 3D and converted to wireframes in Micromine. The mineralized lodes were mapped in 3D using surface mapping, drill hole and mine shaft information to constrain the geometry. The tonalite contact was mapped using information from historical drill holes.



Mapping the lodes at Mt Flora in 3D allowed Duke to accurately plan their first drill program at Mt Flora



# DETAILED EXPLORATION REVIEW AND EXPLORATION TARGET CALCULATION

Re-estimate the potential metal endowment for Cu, Ag, and Au at the Bundarra Project as an Exploration Target in compliance with JORC 2012 report standards

## Review drilling and resource data

All documented drilling and mining information were summarised, and pre-JORC resource estimates reviewed.

## Review geology data

Historic exploration reports were reviewed for relevant data to summarise the geology of the area.

**Detailed Review**  
Mt. Flora, Isens,  
Quorn and  
Rodgers

## Estimate exploration target

A JORC compliant target was estimated and constrained by reviewing current mining operations to develop cut offs for the metals of interest.

## Prioritise the best prospect: Mt Flora

Mt Flora has the best potential for economic Cu, Au, Ag and Mo resource definition and is the most advanced in terms of work done.

A preliminary unconstrained targeting block model was completed for the drilled area of the main Mt Flora workings.

	Cu	Ag	Au
Metal Grade	0.67%	7.8 g/t	0.02 g/t
Metal Amount	56,000 (t)	2.1M (oz)	6,000 (oz)
Cu% Cut off	0.3%	Deposit Tonnes 8.3M	

Preliminary block model results at 0.3% Cu cut-off

# DRILL PLANNING AND DRILLING



Historically, five main lodes were worked at Mt Flora:

- Essie
- Flora
- Green Outcrops
- Eastern Lodes



The lodes were drilled by Endeavour Oil in 1975, with very encouraging Cu, Ag, and Au results.



Duke Exploration planned to follow up the historical results, aiming to intersect the main lodes. A drill programme was designed to scope the potential for a mining operation.

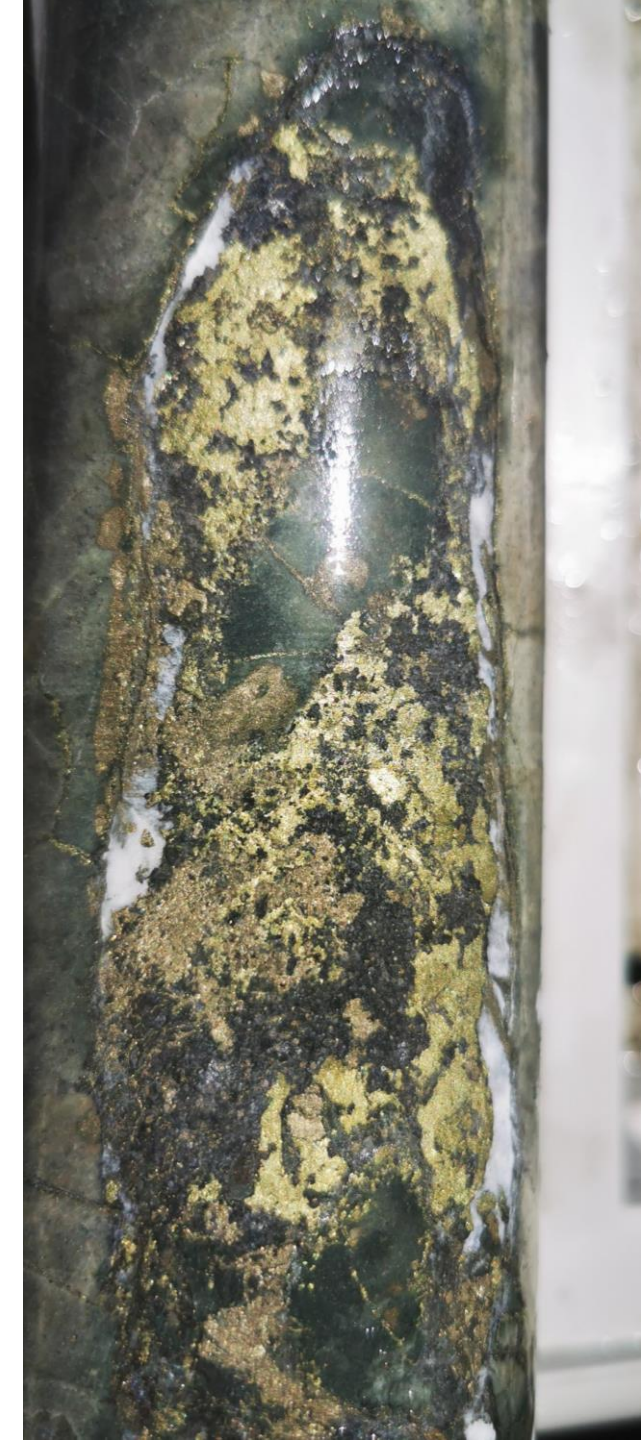
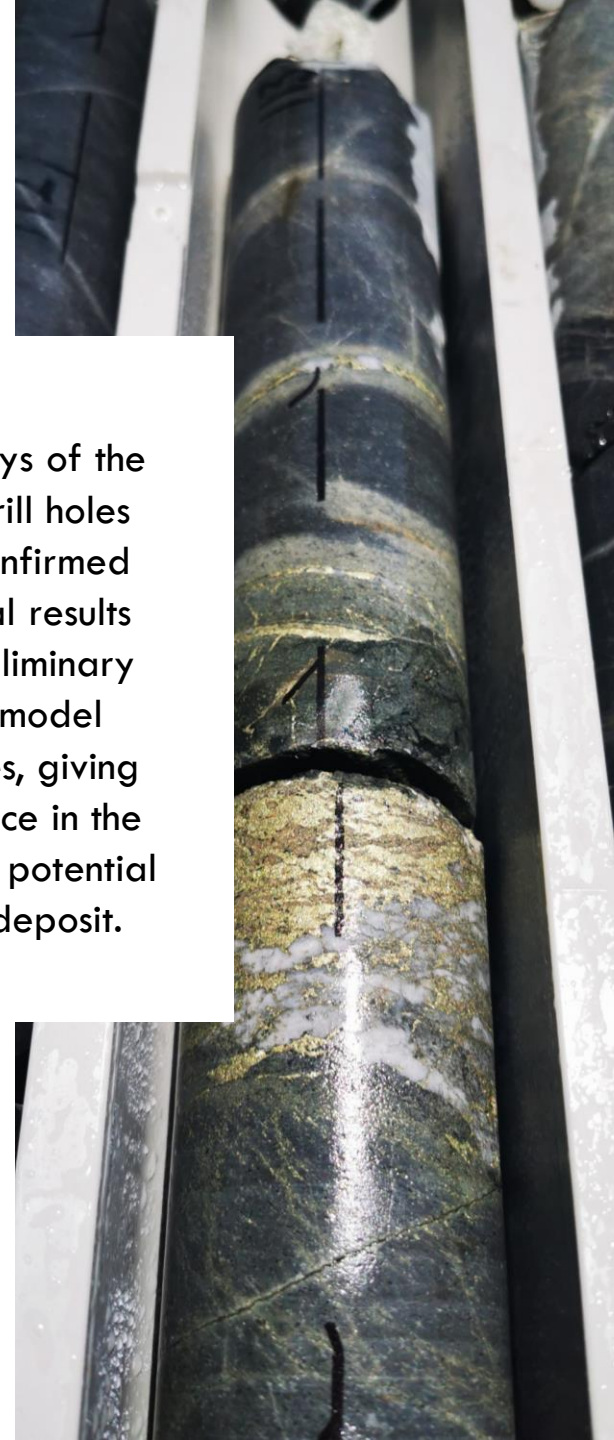
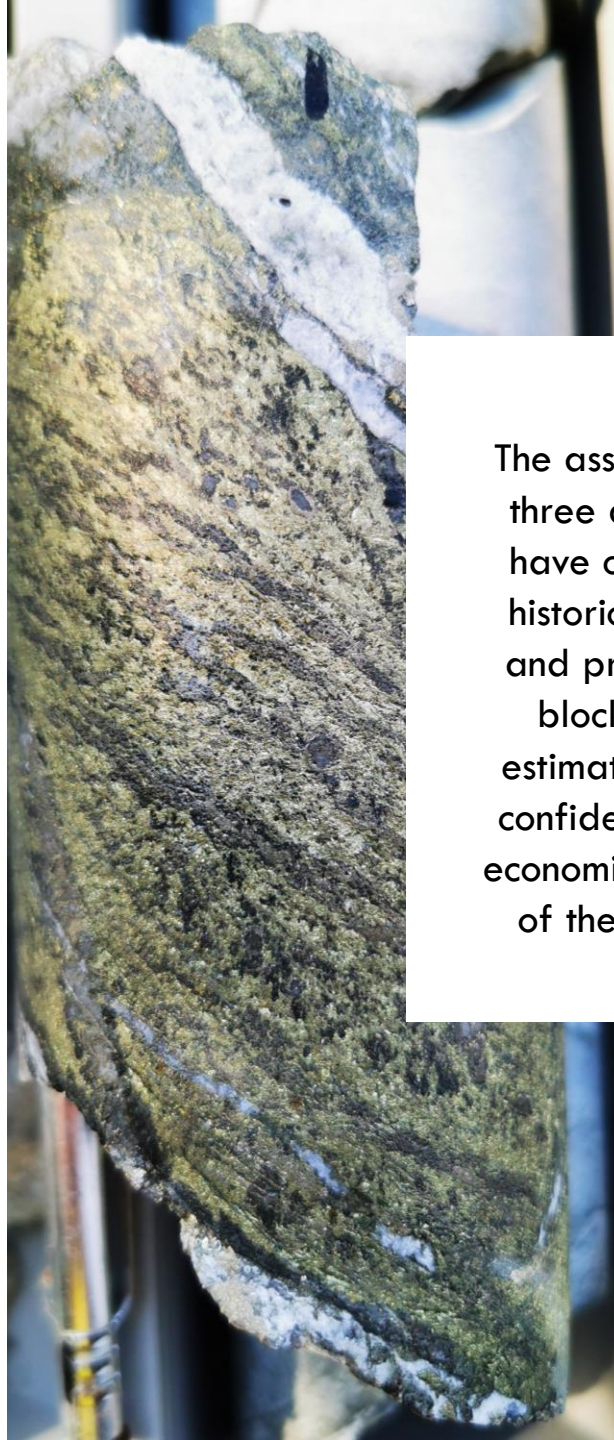


Drilling was undertaken in October 2019 managed by Kenex geologists. Three diamond holes were drilled for a total of 550 m at the Mt Flora prospect.



The three drill holes have provided valuable information about **lithology, alteration and mineralisation** at Mt. Flora.





The assays of the three drill holes have confirmed historical results and preliminary block model estimates, giving confidence in the economic potential of the deposit.



# SIGNIFICANT DRILL INTERSECTIONS

## DFD001

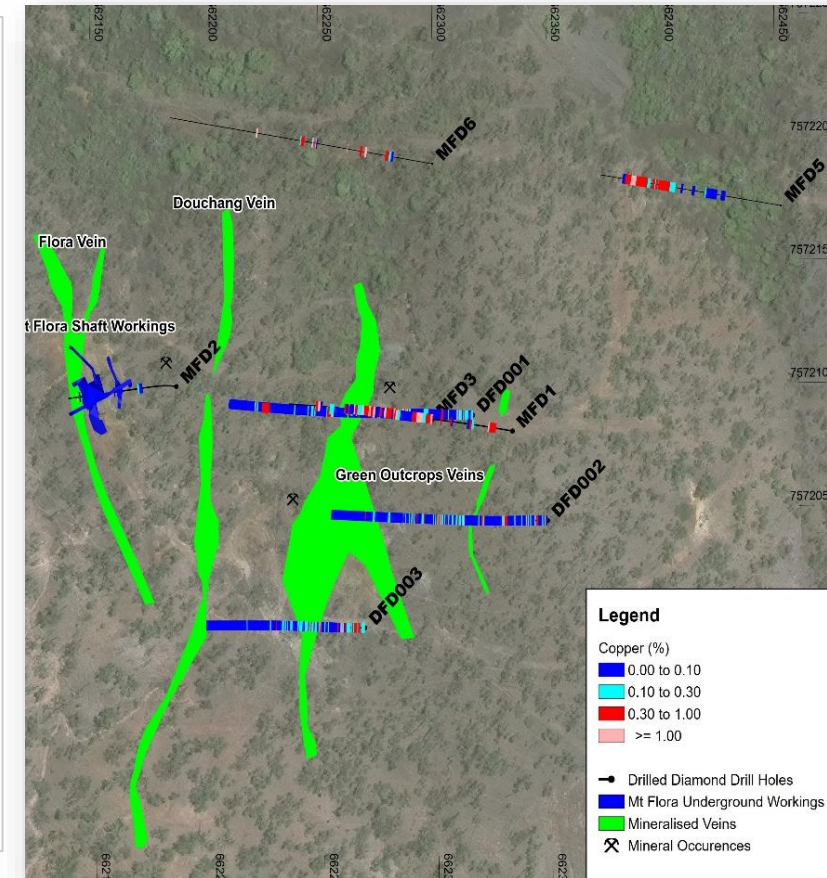
- 1.64 m @ 3.18% Cu, 69 ppm Ag, 0.417 ppm Au and 267 ppm Mo from 12.2 m.
- 2 m @ 0.49% Cu, 9 ppm Ag from 27 m.
- 16.65 m @ 1.15% Cu, 16 ppm Ag, .03 ppm Au and 120 ppm Mo from 58.35 m.
- 4.8 m @ 0.49% Cu, 9 ppm Ag, 60 ppm Mo from 85.2 m.
- 1 m @ 0.53% Cu, 11 ppm Ag from 103 m.
- 4.95 m @ 0.96% Cu, 15 ppm Ag, 0.03 ppm Au, 187 ppm Mo from 126.55 m.
- 1 m @ 0.4% Cu, 68 ppm Mo from 194 m.

## DFD002

- 1.1 m @ 0.38% Cu from 1 m.
- 1.6 m @ 0.68% Cu from 8.6 m.
- 1 m @ 0.45% Cu from 18 m.
- 6.9 m @ 0.7% Cu, 9.6 ppm Ag from 36.5 m.
- 3.15 m @ 0.51% Cu, 6 ppm Ag, 168 ppm Mo from 57.2 m.
- 5.5 m @ 0.5% Cu, 51 ppm Mo from 75.9 m.
- 4.5 m @ 1.3% Cu, 14 ppm Ag, 0.075 ppm Au, 859 ppm Mo from 95.85 m.
- 1 m @ 0.31% Cu from 110 m.
- 1 m @ 0.37% Cu from 120 m.

## DFD003

- 7.5 m @ 0.34% Cu from 4.4 m.
- 8.15 m @ 0.92% Cu from 17 m.
- 2.77 m @ 0.34% Cu from 40.23 m.
- 3.35 m @ 0.31% Cu from 48.65 m.



## RELEVANT NOTES:

The orientations of the veins have been measured with more accuracy and the contact between the metasediments and the tonalite intrusion has been intersected in all three drill holes. The depth of oxidation is confirmed to extend to 18-26 m vertically below surface. Copper mineralisation is strongly structurally controlled, being hosted by veins.



Downhole wireline logging was used to acquire optical and acoustic televiewer images of the drill hole walls, as well as a continuous record of physical property data down the holes (density, magnetic susceptibility, natural gamma radiation, and resistivity).

The data were logged and analysed by Kenex to collect lithology and structural information that could be compared with the core logging and provide important correlations for future RC drilling.

Analysis of the physical property and assay data confirms a strong statistically valid correlation between copper sulphide mineralisation and conductivity and differentiation can be made between the metasediments (relatively high gamma) and tonalite (relatively high density).



## WIRELINE LOGGING OF THE DIAMOND DRILL HOLES



# BUNDARRA ROCK LIBRARY



The next stage of work will include incorporating the new data from the recent drilling with the historical data to create a rock library for Bundarra.

The rock library will be a database of the lithologies, alteration types, and mineralisation types that are present at Bundarra, which is linked to the geological maps.

This will include all known information about each rock type and will involve gathering extra vital information from petrography studies, petrophysical analysis of selected samples, and whole rock geochemical analyses.



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For more information about the project:

[View the Kenex PacRIM presentation on mapping porphyry targets at Bundarra](#) | [Read Duke Exploration shareholder updates](#)