Attachment 7: Siting and Location

Climate

The Kalgoorlie region has a semi-arid climate with hot summers and mild winters. Annual rainfall varies between 108 and 530 mm with an average of 266 mm, with rainfall occurring during all months of the year. Significant summer rainfall is experienced due to tropical monsoon systems moving across the state from the north. Winter rainfall generally originates from broad frontal lows that move in from the west.

Relief and Drainage

The topography in the vicinity of Kalgoorlie is characterised by gently undulating relief, with elevations ranging between 360 and 400 m above Australian Height Datum (mAHD). Greenstone belts (mafic basement rocks) form prominent hills. The Fimiston, Mt Percy and Mt Charlotte Operational Areas are located on an elevated topographic area.

Geology and geotechnical assessment

The proposed exploration at Little Wonder and Mt Ferrum will be in a folded geological sequence with three lithological units, Kapai Shale, Devon Consol Basalts and Hannans Lake Serpentine. The exploration project has been geotechnically assessed, with the assessment memo provided as an attachment.

The main rock types at Mt Percy are the Hannans Lake Serpentinite, Devon Consols Basalt, Kapai Slate, and Williamstown Dolerite. The Hannans Lake Serpentinite is the major rock type in the Sir John and Mystery Open Pits and is a minor rock type in the Union Club Open Pit. All four lithologies are well exposed in the Union Club and Sir John (now backfilled) Open Pits.

Stratigraphy

A generalised stratigraphy relevant to both areas of this project is shown in **Error! Reference source not found.**

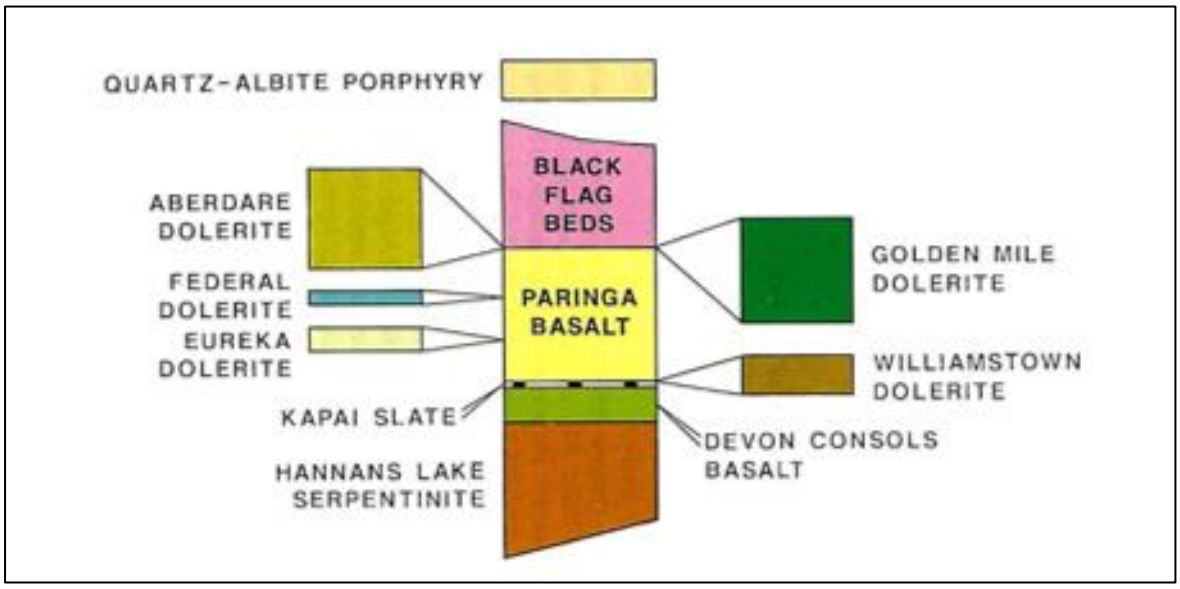

Figure 1: Generalised Stratigraphy

Groundwater

The Mt Charlotte Underground Mine is not connected with other underground developments (for example old workings below Fimiston Open Pit).

Mt Charlotte has been described as a "dry mine" by KCGM geotechnical staff, and seepage through rock faces is noted to be rare. Several exploration boreholes located towards the bottom of the mine are noted to seep groundwater from the collars (Peter Clifton & Associates, 2014).

There is a small-scale dewatering operation at the Mt Charlotte Underground Mine which keeps the active working areas dry. An existing Licence to Take Water GWL63553(7) to allow dewatering of the Mt Charlotte Underground Mine. GWL63553(7) is valid until 15 January 2027.

Dewatering at the Mt Charlotte Underground Mine has occurred from the 1960s. The deepest pumping station at Mt Charlotte is located 1,190 m below the surface. A large proportion of the introduced saline water used for operational activities gravitates to the bottom of the mine and is pumped back to the surface as a blend of groundwater and saline water.

Groundwater quality is saline to hypersaline. The groundwater, together with hypersaline water used for operational activities, is pumped out of Mt Charlotte Underground Mine into the existing saline reticulation circuit.

Surface water

The Mt Charlotte Operational Areas lies within the Hannan Lake catchment. Drainage is poorly defined in the Mt Charlotte area, but generally flows eastward to the Eastern Floodway.

Flora

The vegetation in the vicinity of the Mt Charlotte is significantly degraded due to anthropogenic influences, in particular historic mining activities. The two main vegetation types in the vicinity are ‘cleared vegetation’ or revegetated ‘mosaic of native and non local species’.

Terrestrial Fauna

No recent fauna studies have been undertaken at Mt Charlotte area. Recent verbal advice received from Phoenix Environmental Services is that the area has been too disturbed to consider it to be significant habitat. The area around the Mt Charlotte Underground Mine has been disturbed by historical mining, and other anthropogenic activities. These disturbances have resulted in the disruption to, or removal of many fauna habitats in the Kalgoorlie-Boulder area.

Reserves and Other Considerations

The proposed activities are not located on a Reserve.

KCGM is currently progressing consultation with a new claimant group, the Marilinyu Ghoorlie group, regarding all future works, including this project. Consultation will be completed before implementation of proposed activities.

Public Drinking Water Supply Areas

The proposed activities are not located on a Public Drinking Water Supply Area.

Environmentally Sensitive Areas

The proposed activities do not occur in an ESA.

Conservation significant flora and fauna

There are no known fauna and flora of environmental significance in the proposed activity area.

Problematic Materials / Geochemistry

No problematic materials will be disturbed during the proposed activities.

Mineralisation within the Mt Charlotte Underground Mine occurs primarily in the GMD. The results of geochemical testing to date (MBS, 2015) indicate that mafic waste rock (Paringa Basalt and GMD) and has been classified as Non Acid Forming (NAF) with neutral to alkaline pH and low to moderate salinity levels. The risk of Acid Rock Drainage is considered very low as all waste rock generated from the proposed underground mining operation will remain underground. Discharge of any long-term underground water will be to the Fimiston Open Pit.

A review of DMIRS tengraph, identified no Environmental Sensitive Areas, apart from the City of Kalgoorlie Boulder adjacent to the proposed activities (Figure 2). Figure 3 and Figure 4 outline the Mt Percy and Mt Charlotte operational areas highlighting the proposed activities are wholly within an existing cleared/disturbed mine footprint.

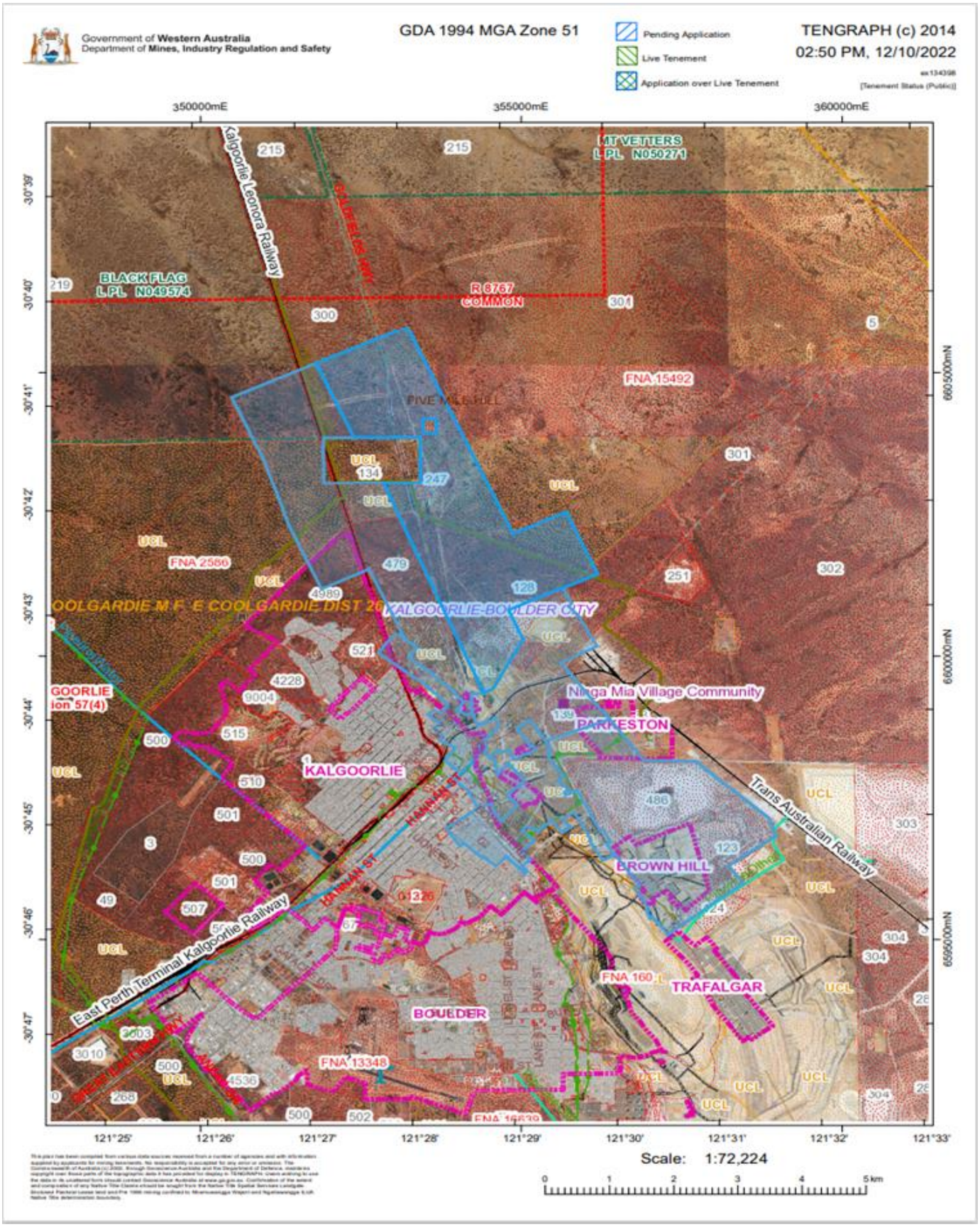

Figure 2: Siting and Location

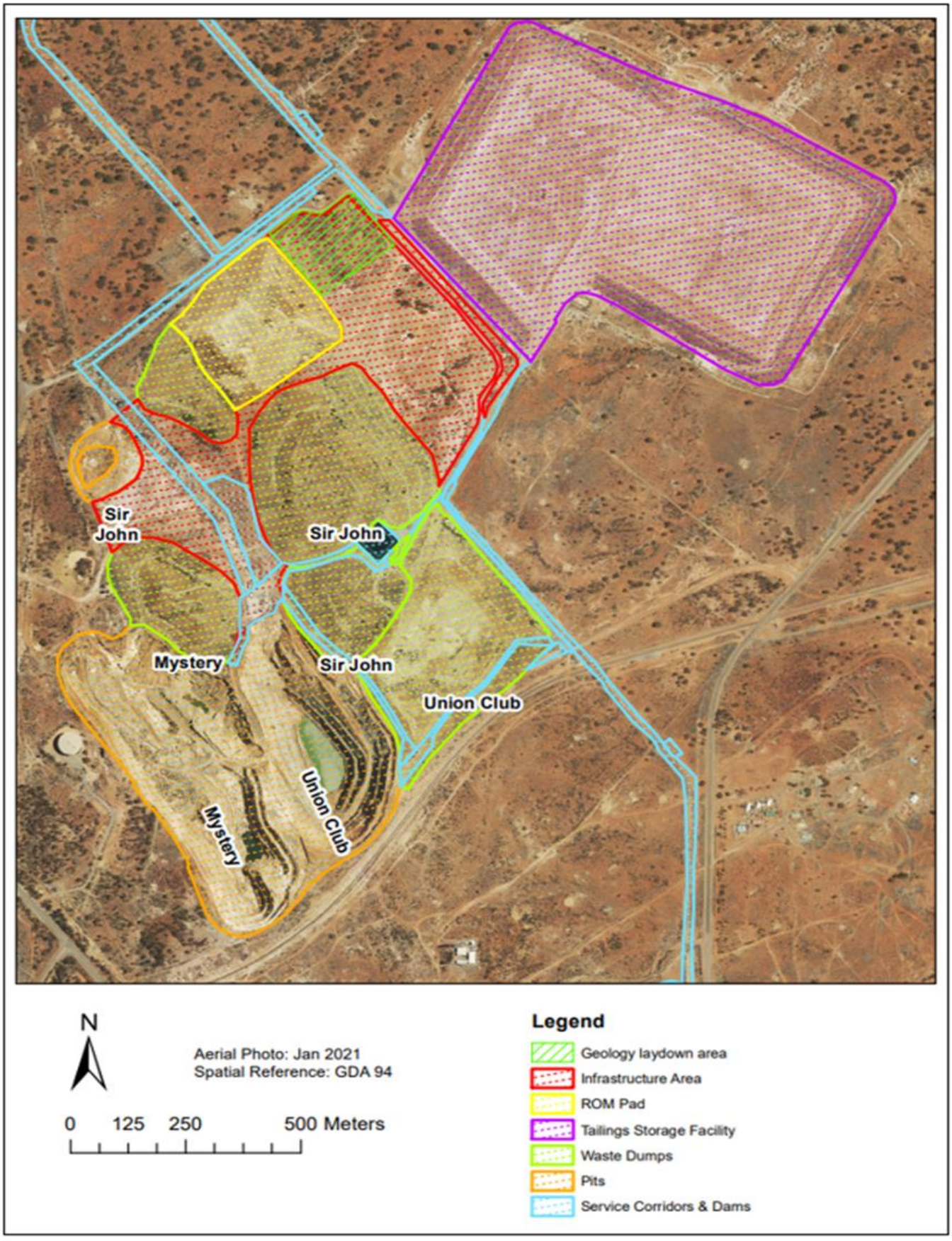

Figure 3: Mt Percy Operations

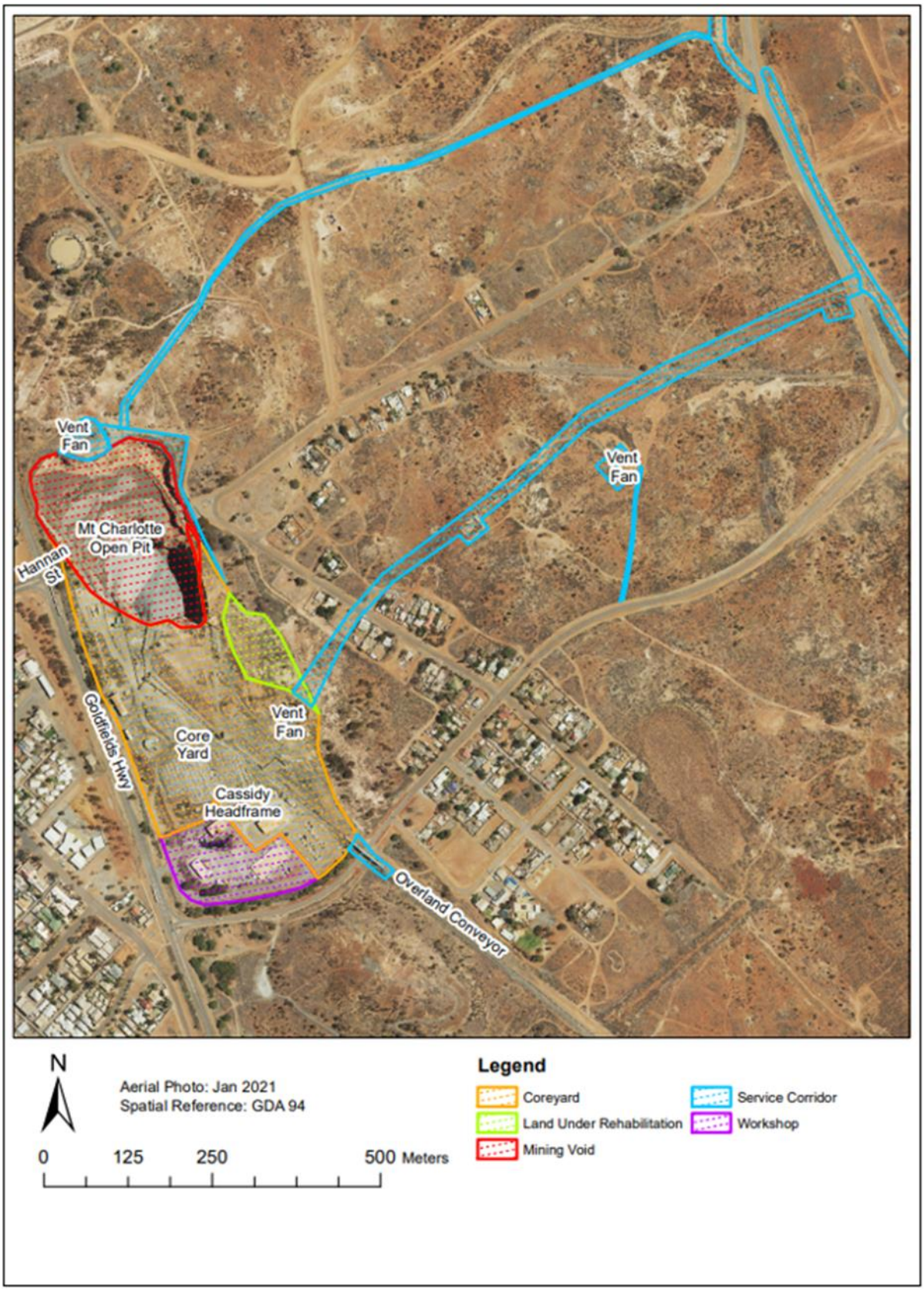

Figure 4: Mt Charlotte Operations