Tower Hill Subterranean Fauna

Baseline and Targeted Assessment

Prepared for:

Genesis Minerals Limited

March 2026
Final Report

Short-Range Endemics | Subterranean Fauna | Wetlands

Tower Hill Subterranean Fauna Assessment

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EXECUTIVE SUMMARY

Genesis Minerals Limited (Genesis) is planning to dewater the Tower Hill pit lake (hereafter "the Project") and currently seeks to recommence operations with a projected mine life of seven years. The Tower Hill pit was historically used to store hypersaline discharge from other mine sites. Currently, the base of the Tower Hill pit extends to 190 mBGL, with a final expansion proposed to deepen the pit by 130 m, resulting in a total depth of 320 mBGL; therefore, substantial dewatering (4.5 GL) is required as part of development. Genesis wishes to finalise the existing subterranean fauna report based on updated pit layout and drawdown contour.

Recognising the potential for Project development to affect subterranean communities, Genesis commissioned Bennelongia Environmental Consultants to assess subterranean biological values in the Project area.

An initial desktop assessment covering an area of 100 x 100 km centred on the Project recovered 69 records of 990 individuals attributable to at least 16 species of stygofauna, and 38 records of 40 individuals attributable to at least 14 species of troglofauna. Besides two stygofauna samples collected from Melita Calcrete, which partially overlaps with the Gwalia lease, none of the subterranean samples were collected within 25 km of the Project. This probably reflects a historical absence of sampling, as the geology at the Project is highly prospective for stygofauna: colluvium, alluvium, and calcrete all occur, and while in general the groundwater salinity is high, there are areas where it is suitable for stygofauna.

A baseline field survey sampled stygofauna from 10 boreholes. Stygofauna were collected from 5 of the 10 boreholes (4/5 boreholes overly the Melita Calcrete), in salinity ranging from 10,800-120,100 µS/cm (seawater is approximately 50,000 µS/cm). In total, 364 specimens attributable to at least 21 species were collected; 13 of the species are new, including two potentially new genera. The majority of species were crustaceans, particularly copepods, but there were some oligochaete annelids, beetles, and miscellaneous roundworms.

Following findings of the baseline survey, the Department of Energy, Mines, Industry Regulation and Safety (hereafter 'the Department') requested further information (RFI) relating the stygofauna baseline survey. This resulted in a targeted survey conducted around the Project area, covering the Melita Calcrete PEC and reference locations within the Raeside Palaeovalley (approximately 15 km from the Project Development Envelope). In total, 50 bore holes were surveyed during the targeted survey. Salinity at these varied significantly, ranging from 450-138,000 µS/cm, with the reference boreholes showing the lowest salinity levels. The targeted survey recovered a total of 318 subterranean fauna specimens from 11 of the 50 holes. At least 16 species were collected, including 2 species only identified to higher order. Of the 16 species, 8 were recorded from the Melita Calcrete PEC. Findings suggest the stygofauna community occurring at the Melita Calcrete is different from the one identified from the reference holes in the Raeside Palaeovalley.

Combining the baseline and targeted surveys, 60 boreholes have been sampled in total. These have yielded 682 specimens of at least 30 species, including two species only identified as higher order. Twenty-three of the recorded species occur inside the Melita Calcrete, including the high order Nematoda spp. and the widespread species Enchytraeidae `2 bundle` s.l. (long thin 2 per seg) and Enchytraeidae `2 bundle` s.l. (short sclero 4 per seg).

The survey indicates a rich assemblage of stygofauna occurs at least in the Melita Calcrete, which partially overlaps the Project area, and possibly beyond it, despite relatively high salinity levels in and around the Project area. The high tolerance of the community to salinity is exemplified by bore TSF2/04, which supported the highest number of species and second highest number of animals, having one of the highest salinities (120,100 µS/cm) of all the bores that yielded stygofauna. Additionally, the second most speciose bore (UNK01) and the most abundant bore (TSF2/06) also had relatively high salinity levels of

49,800 µS/cm and 54,300 µS/cm, respectively. Although aquifers with high salinity do not generally provide suitable habitat for stygofauna (e.g. Halse *et al*. 2014), some species are halophiles and stygofauna may be found in many hypersaline situations (Schulz *et al*. 2013; Outback Ecology 2011).

The small size (2.5 km^2, the smallest of any calcrete known in the Yilgarn) and isolation of the Melita Calcrete probably contributed to generating a rich styogofaunal community. Groundwater drawdown occurred during the original establishment of the Gwalia mine pit and the Tower Hill drawdown likely intersects it. It is evident the stygofaunal community has acclimated to any changes in groundwater regimen as a result of mining at Gwalia, which has been ongoing for over a century.

It has been suggested that the eastern margin of the Melita Calcrete PEC extends into areas of hypersaline weathered bedrock with low suitability for stygofauna, with potential stygofauna habitat likely to be confined to zones of calcretised alluvium and alluvial sands and gravels in the topmost layers of the surficial aquifer as groundwater becomes hypersaline with depth (Pennington Scott 2025). However, results of the baseline and targeted surveys suggest salinity is not likely to constrain stygofauna species distributions.

Survey results suggest that stygofauna are likely to be constrained to what has been identified in Pennington Scott (2025) as the "calcrete possible" area which is found towards the centre and western sections of the PEC. Only three of the boreholes sampled in the eastern section of the PEC yielded stygofauna, with only 1 or 2 species and 3 or fewer specimens. This conforms with Pennington Scott's (2025) suggestion that stygofauna species richness and abundance are lower in the eastern section of the PEC.

Current data suggest that the development of the Project is unlikely to affect the stygofauna species that constitute the PEC given most of the Project development will occur at the east and the north sections of the PEC, where stygofauna richness appears to be lowest.

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1. INTRODUCTION

Genesis Minerals Limited (Genesis) manages several gold operations in the Leonora region of Western Australia, including Gwalia and Tower Hill mines, both located near Leonora and approximately 235 km north of Kalgoorlie in Western Australia (Figure 1). Gwalia was established in 1896 and has since become the deepest underground trucking mine in Australia. In 2023, Genesis acquired St Barbara Ltd (St Barbara), along with the Leonora Gold Operation (LGO) and surrounding development opportunities such as Gwalia, Harbour Lights, Tower Hill and Green Banana pits. Genesis is seeking to recommence developments at the Tower Hill Project (hereafter "the Project") which includes dewatering of the Tower Hill pit lake to recommence mining operations with a projected mine life of seven years. The Tower Hill pit was historically used to store hypersaline discharge from other mine sites; substantial dewatering (4.5 GL) is required as part of development.

Recognising the potential for Project development to affect subterranean communities, Genesis commissioned Bennelongia Environmental Consultants to finalise the existing subterranean fauna report (BEC #600) in the Project area, inclusive of updated site layout and drawdown contours. This report presents the findings of a desktop assessment as well as a subsequent field survey as reported in Bennelongia (2024), and updates relevant data as per pit layout and drawdown contours. In accordance with established guidelines (EPA 2016a, 2021), the objectives of this report are:

- To collate records of subterranean animals from the proposal area and surrounds to determine the types of subterranean fauna present;
- To identify and collate all records of subterranean animals collected during survey;
- To determine the conservation status of the subterranean species recorded and the known distribution of any conservation-significant species; and
- To estimate the likely impact of mining activities on subterranean fauna based on groundwater flow, direction, connectivity, and drawdown.

1.1. Regional Geology

The Project lies in the Eastern Murchison subregion of the Murchison bioregion in Western Australia's Goldfields. The Eastern Murchison is primarily used for grazing on native pastures (85.47% of the area; Cowan 2001). Calcrete aquifers in the subregion's north are known to host significant subterranean communities (Humphreys 2001).

The climate in Leonora is arid. The highest daily mean maximum and minimum temperatures fall in January (37.0 °C and 21.8 °C respectively), and the lowest in July (18.4 °C and 6.1 °C). Monthly mean rainfall is highest in February (30.9 mm) and lowest in September (8.9 mm), but the month with highest mean number of days with rain is June (3.5 days).

The Project lies in the Gwalia Domain, which comprises Archaean mafic to ultramafic greenstone units. The Gwalia Domain is bounded by the Mount George Shear Zone to the east, the Sons of Gwalia Shear Zone to the west and south, and the Clifford Fault to the north. Mafic volcanic extrusives up to 400 m wide make up much of the Gwalia Domain, interspersed with minor thin cherty or pelitic interflow sediments. Dolerite sills and dykes also occur.

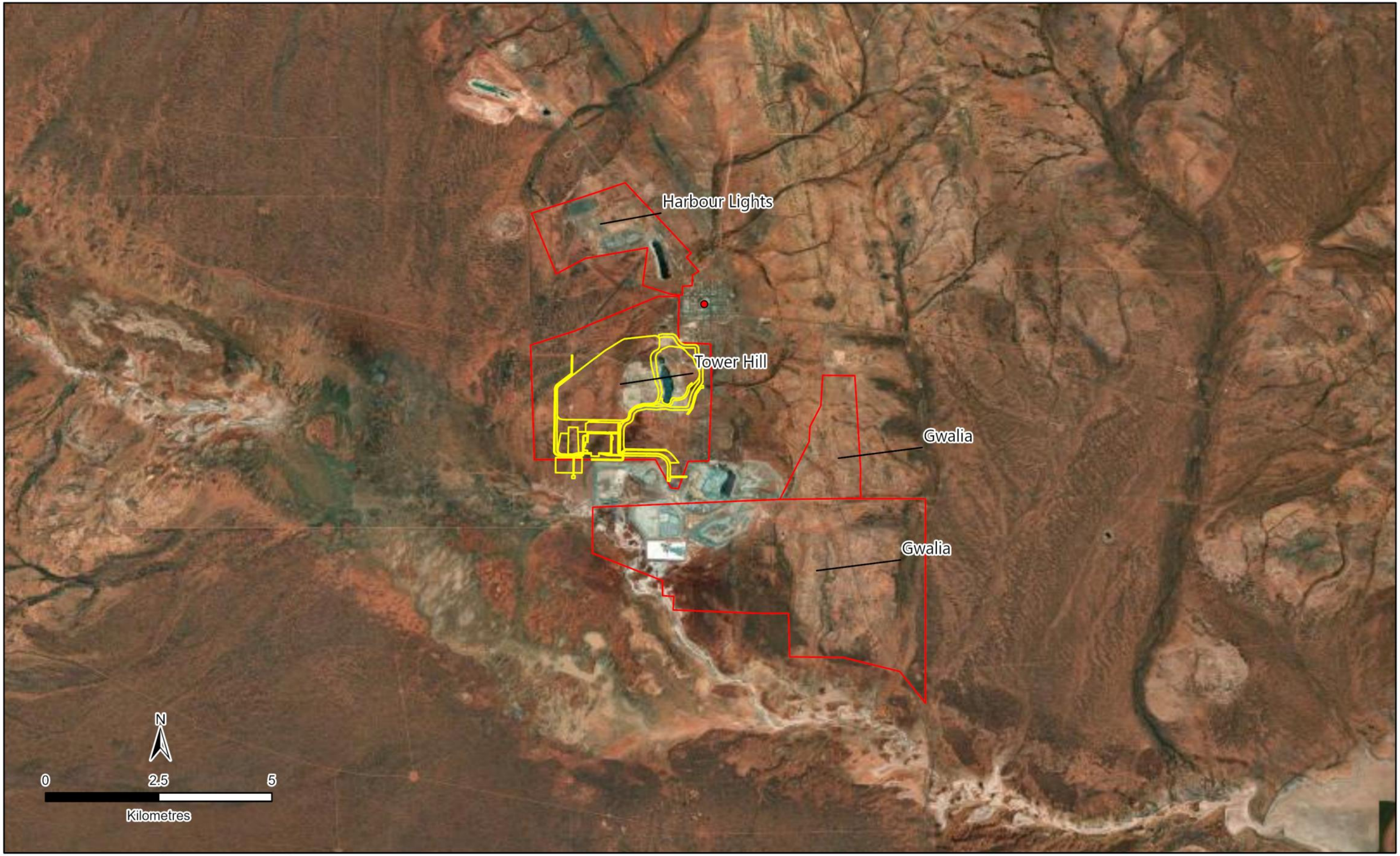
Much of the Project area is categorised as anthropogenically disturbed, in this case cleared for mining. Beyond the immediate impact zones of existing and historic mining operations, regolith comprises predominantly colluvium and alluvium, with small lacustrine areas or areas of exposed rock (Figure 2).

1.2. Hydrogeology

Available data suggest groundwater near the Project is saline to hypersaline (8,000-220,000 µS/cm), but salinity may be locally diluted by the introduction of water drawn up elsewhere (Subterranean Ecology 2008). The Raeside Palaeovalley, which partially overlaps the Project area (Figure 2) is known to host a distinct stygofauna community (Humphreys 2001). Lake Raeside palaeovalley is partly filled by Palaeogene to Quaternary age sedimentary deposits present west of Tower Hill (Pennington Scott 2024).

Clay is the dominant lithology below and adjacent to playas over the lower portion of the palaeovalley associated with internal drainage and deposition of alluvial and lacustrine deposits into slat lakes occupying the central palaeodrainage areas. Mixture of sand, gravel, clay and slit is present through the middle and upper portions of the valley slope. Calcrete has developed associated with present or past drainages through the replacement or cementation of pre-existing material with carbonate in or close to the present or past phreatic zone (Pennington Scott 2024).

Calcrete has been interested extensively in the Upper Deposits by exploratory drill-holes about the eastern margin of the palaeovalley deposits near Tower Hill, although there are no obvious outcrops of calcrete. Drill logs record calcrete extending to depths of over 50 m in some areas. However, it is uncertain what form the calcrete takes, and whether it is solid calcrete deposit or alluvium with carbonate cementation, and it is also unknown whether karstic features are develop in the calcrete (Pennington Scott 2024).



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GCS GDA 1994
Author: K. Sagastume
Date: 30/03/2026

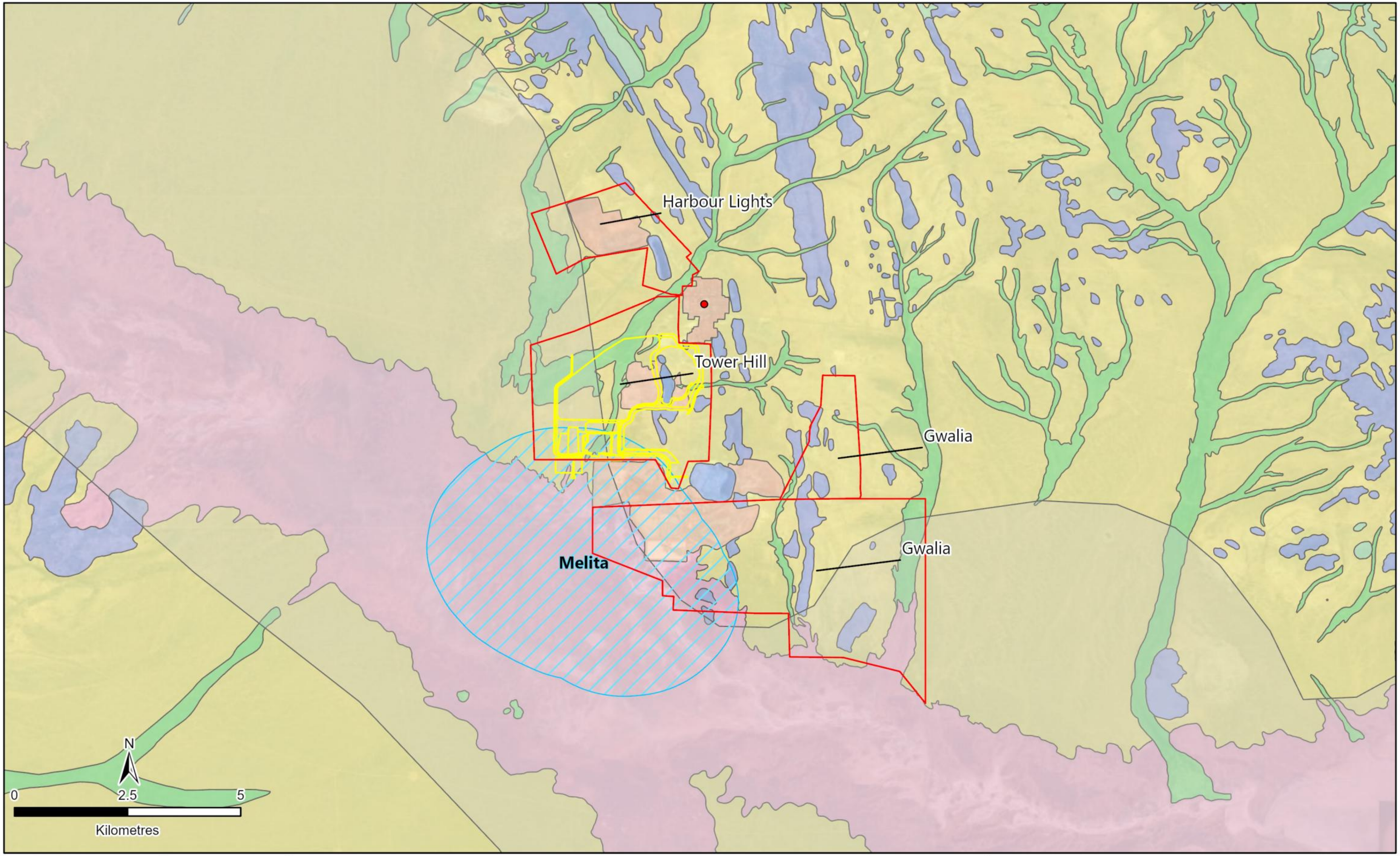
Legend

Project Area

Tower Hill NVCP

Leonora

Figure 1. Location of the Project and its operations. The proposed Tailings Storage Facility 5 site is 6 km south of Leonora, immediately south of the current Gwalia footprint.



Legend

- Project Area
- Tower Hill NVCP
- Priority 1 Calcretes
- Palaeovalleys
- Leonora

Regolith

- Alluvium
- Anthropogenic areas
- Colluvium
- Exposed
- Lacustrine
- Residual
- Sandplain

GCS GDA 1994
Author: K. Sagastume
Date: 30/03/2026

Figure 2. Surface geology and hydrology at the Project.

1.3. Regional Subterranean Fauna Framework

The term subterranean fauna refers to animals living essentially full-time underground. Subterranean animals are divided into two types: stygofauna are aquatic animals that live below ground in water, while troglofauna are air-breathing animals that live underground and require very high humidity (Gibson *et al.* 2019). Stygofauna inhabit vugs, fissures, and interstitial spaces in groundwater aquifers, especially those in alluvium and calcretes. Troglofauna inhabit similar spaces above the water table but with more emphasis on vugs, fissures, and relatively large interstitial spaces.

Subterranean species share several convergent adaptations to life underground where it is dark and resources are limited. These include worm-shaped bodies, elongated chemosensory apparatus, loss of wings, transition towards K-selected breeding strategies, and the loss of skin colouration and eyes (Gibert and Deharveng 2002). Western Australia supports a particularly rich subterranean fauna outside caves (Humphreys 2000; UNESCO World Heritage Centre 2022), with estimates of over 4,000 species, 90% of which remain to be described (Guzik *et al.* 2011; Halse 2018a). Almost all subterranean animals in Western Australia are invertebrates, but fishes (Whitely 1945) and one snake (Aplin 1998) have also been recorded. Most subterranean species are inconspicuous, but contribute substantially to biodiversity and other values, for example by moderating groundwater quality (Hose and Stumpp 2019).

The distribution of subterranean animals is largely determined by prevailing lithology. In Western Australia, subterranean animals probably mostly occupy spaces only a few millimetres in width (Halse 2018a, b; Halse *et al.* 2018) but the key characteristics of their habitat(s) is that it is rich in such spaces (e.g. interstices in alluvium, screen, and voids; vugs, cavities, and fissures in consolidated geologies) and that the spaces are well connected laterally and vertically. Lateral connectivity facilitates dispersal of animals, while vertical connectivity ultimately to the surface is crucial for delivering carbon and other nutrients to subterranean ecosystems (Korbel and Hose 2011). Connectivity may be disrupted by a range of factors, including dykes, major landscape features, and chemical barriers.

Subterranean animals tend to have limited distributions. Most stygofauna species exhibit short range endemism (SRE), having substantially smaller ranges than Harvey's (2002) SRE criterion of 10,000 km^2 (Cooper *et al.* 2007; Cooper *et al.* 2002; Eberhard *et al.* 2009). The ranges of troglofauna have yet to be investigated in detail but are mostly even more restricted than those of stygofauna, with many species having linear ranges less than 10 km (Halse and Pearson 2014; Lamoreux 2004). Given that species with small ranges are more vulnerable to extinction following habitat degradation than wider ranging species, it follows that subterranean taxa are highly susceptible to anthropogenic threats, particularly large-scale excavation and groundwater abstraction (Halse 2018a; Ponder and Colgan 2002).

Stygofauna

Most stygofauna species in Western Australia are crustaceans, particularly ostracods and copepods, although other groups such as worms and beetles are sometimes abundant (DEC 2009; DPAW 2022; Matthews *et al.* 2019). The most productive known stygofauna habitats are saturated alluvial and calcrete aquifers associated with palaeochannel deposits, but stygofauna also inhabit karstic limestones, hyporheic zones, groundwater-fed springs, and aquifers in some iron formations, especially channel iron (Halse 2018b; Hyde *et al.* 2018). Stygofauna are rarely abundant where depth to the water table is more than 30 m below ground level (Halse 2018a; Halse and Pearson 2014). Aquifers with higher transmissivity are more likely to host stygofauna than aquifers with lower transmissivity (Maurice and Bloomfield 2012). Stygofauna mostly occur in fresh to hyposaline water (Halse *et al.* 2014; Humphreys *et al.* 2009), but can occur in higher salinities (Bennelongia 2016; Reeves *et al.* 2007; Watts and Humphreys 2006).

Troglofauna

Western Australia appears to be almost unique for its diverse and widespread troglofauna inhabiting small spaces in the vadose zone (Halse and Pearson 2014). The Western Australian troglofauna comprises mostly arthropods, with a variety of isopods, insects, spiders, pseudoscorpions, and millipedes, centipedes, and their allies represented. Troglofauna are particularly likely to occur in weathered or mineralised iron formations, alluvium or colluvium in valley-fill areas (including areas of karstic calcrete), and fractured sandstone (Halse 2018a). Troglofauna typically require relative humidity close to 100% (Howarth 1983).

1.3.1. Conservation legislation

Native flora and fauna in Western Australia are protected at both State and Commonwealth levels. At the state level, the *Biodiversity Conservation Act 2016* (BC Act) provides a legal framework for protection of species, particularly for species listed by the Minister for the Environment as threatened. In addition to the formal list of threatened species under the BC Act, the Department of Biodiversity, Conservation and Attractions (DBCA) also maintains a list of priority fauna species that are of conservation importance but, for various reasons, do not meet the criteria for listing as threatened. At the national level, the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) provides a legal framework to protect and manage nationally and internationally important flora, fauna and ecological communities.

Both the EPBC and BC Acts provide frameworks for the protection of threatened ecological communities (TECs), where an ecological community is defined as a naturally occurring group of plants, animals, and other organisms interacting in unique habitat (with the unique habitat created by the combination of the species and their landscape setting; DEC 2013). Communities occupying a small or threatened habitat are classified as threatened ecological communities (TECs) under the BC Act and the EPBC Act. Within Western Australia, DBCA also informally recognises communities of potential conservation concern, but for which there is little information, as priority ecological communities (PECs). The list of TECs recognised under the BC Act is larger than the EPBC Act list and has much greater focus on subterranean communities.

1.3.2. Previous survey

Subterranean Ecology (2008) carried out a pilot survey for stygofauna in January 2008. In total, 38 bores and wells were sampled using net hauling; 220 specimens were collected, of which only 14 proved to be stygofaunal, all specimens of the copepod *Mesocyclops brooksi* (Subterranean Ecology 2008). Because *M. brooksi* is widespread, its collection was not considered of conservation significance. No other stygofauna were collected.

Troglofauna have not been sampled in the Project area before.

2. DESKTOP ASSESSMENT

2.1.1. Methods

The desktop assessment combined three sources of information using GIS mapping:

- Boundary information and description of Project activity was supplied by Genesis.
- Records of subterranean animal occurrence in the vicinity of the project were derived from searching the Western Australia Museum and Bennelongia databases, as well as relevant consulting reports. For each identifiable taxon, the number of records (i.e. the number of times the taxon was found) and the number of individuals collected (i.e. how many were found in each record) from any or all of these sources was collated. Distribution patterns of identifiable taxa were cross-referenced with the Atlas of Living Australia.

- Boundaries of the calcrete PECs were provided by DBCA and the Department of Mines, Industry Regulation, and Safety.

These sources were combined in order to assess the presence or likely presence of subterranean fauna, based on prior records and habitat information. Database searches covered an area of 10,000 km^2 centred on the Project (vertices at -28.4322, 120.8207 and -29.3341, 121.8410). Analysis and mapping were undertaken using ArcGIS Pro v2.9.

2.1.2. Results

In total, 69 records of 990 individuals attributable to at least 16 species of stygofauna were recovered in the desktop search (Table 1; Figure 3). The majority (57 records of 923 specimens) were crustaceans, with strong representation from cyclopoids, harpacticoids, and isopods. The majority of specimens came from one of two surveys, one carried out by Bennelongia in March 2023 south-east of the Project and another carried out much earlier (early 2000s) in association with the Western Australian Museum north-west of the Project in the Sturt Meadows calcrete. Both surveys are more than 20 km from the Project boundaries. The closest samples comprised unidentified amphipods in the Melita Calcrete immediately west of the Gwalia lease.

Troglofauna results were similarly distributed. There were 38 records of 40 specimens in the collection records, attributable to at least 14 species (Table 2; Figure 4). All specimens were found at least 40 km from the Project boundaries, clustered in two survey areas as with stygofauna. Isopod crustaceans dominated the troglofauna samples.

Two Priority 1 calcrete PECs fall within the search area, both flagged for the unique assemblages of invertebrates found in the groundwater. The Sturt Meadows calcrete lies 36 km north-west of the Project area. The Melita Calcrete partially overlaps with the Tower Hill and Gwalia leases of the Project area. Both calcretes are associated with the Raeside Palaeovalley. The Melita Calcrete is the smallest known from the Yilgarn at 2.5 km^2 (Austin *et al.* 2023), whereas the mean calcrete area is 90.8 km^2 (Harvey *et al.* 2011).

Table 1. Stygofauna identified in the desktop search area.
No. records refers to the number of times the taxon was recorded. No. individuals refers to the number of individuals recorded across all records. Bolded values indicate higher taxonomic ranks. Grey highlighting indicates higher order identifications of specimens that may be representatives of species listed. Blue highlighting indicates higher order identifications of specimens that are not represented elsewhere in the list; these entries are considered discrete species.

Lowest identification	No. records	No. individuals	Comments
Annelida	**6**	**57**	
Clitellata	**6**	**57**	
Oligochaeta	**6**	**57**	
Tubificata	**6**	**57**	
Tubificida	**6**	**57**	
Enchytraeidae	**5**	**31**	
Enchytraeidae \`2 bundle\` s.l. (short sclero 4 per seg)	1	2	Probably amphibious. Least environmental significance.
Enchytraeidae \`3 bundle\` s.l. (short sclero)	2	25	Probably amphibious. Least environmental significance.
Enchytraeidae sp.	2	4	Probably amphibious. Least environmental significance.
Tubificidae	**1**	**26**	
Tubificidae \`BOL086\`	1	26	Nearest collection is 25 km south-east of Gwalia lease.
Arthropoda	**57**	**923**	
Crustacea	**57**	**923**	
Malacostraca	**37**	**138**	
Eumalacostraca	**37**	**138**	
Amphipoda	**37**	**138**	
Amphipoda sp.	3	23	Collected immediately west of Gwalia lease.
Talitrida	**34**	**115**	
Chiltoniidae	**34**	**115**	
Scutachiltonia axfordi	17	25	Nearest collection is ~45 km north-west of Tower Hill.
Stygochiltonia bradfordae	5	13	Nearest collection is ~45 km north-west of Tower Hill.
Yilgarniella sturtensis	12	77	Nearest collection is ~45 km north-west of Tower Hill.
Maxillopoda	**11**	**661**	
Copepoda	**11**	**661**	
Cyclopoida	**3**	**284**	

Lowest identification	No. records	No. individuals	Comments
Cyclopoida sp.			
Cyclopidae	**3**	**284**	
Mesocyclops brooksi	3	284	Widespread.
Harpacticoida sp.			
Harpacticoida	**8**	**377**	
Ameiridae	**1**	**2**	
Hirtaleptomesochra \`BHA358\`	1	2	Nearest collection is 38 km south-east of Gwalia lease.
Canthocamptidae	**6**	**374**	
Australocamptus similis	5	314	Nearest collection is ~45 km north-west of Tower Hill. Presumably widespread.
Australocamptus similis s.l.	1	60	Nearest collection is ~45 km north-west of Tower Hill. Possible species complex.
Miraciidae	**1**	**1**	
Schizopera \`BHA357\`	1	1	Nearest collection is 35 km south-east of Gwalia lease.
Ostracoda	**9**	**124**	
Ostracoda sp.	8	122	
Podocopa	**1**	**2**	
Podocopida	**1**	**2**	
Ilyocyprididae	**1**	**2**	
Ilyocypris australiensis	1	2	Widespread.
Nematoda	**3**	**7**	
Nematoda spp.	3	7	No conservation significance.
Platyhelminthes	**1**	**1**	
Turbellaria sp.	1	1	No conservation significance.
Rotifera	**2**	**2**	
Bdelloidea	**2**	**2**	
Bdelloidea sp. 2:2	2	2	No conservation significance.
Grand Total	**69**	**990**	

Table 2. Troglofauna identified in the desktop search area.
No. records refers to the number of times the taxon was recorded. No. individuals refers to the number of individuals recorded across all records. Bolded values indicate higher taxonomic ranks. Grey highlighting indicates higher order identifications of specimens that may be representatives of species listed. Blue highlighting indicates higher order identifications of specimens that are not represented elsewhere in the list; these entries are considered discrete species.

Lowest identification	No. records	No. individuals	Comments
Arthropoda	**38**	**40**	
Chelicerata	**17**	**17**	
Arachnida	**17**	**17**	
Araneae	**7**	**7**	
Araneomorphae	**7**	**7**	
Gallieniellidae	**1**	**1**	
Gallieniellidae sp.	1	1	Nearest collection is ~45 km north-west of Tower Hill.
Gnaphosidae	**2**	**2**	
nr *Encoptarthria* sp.	2	2	Nearest collection is ~45 km north-west of Tower Hill.
Oonopidae	**4**	**4**	
Prethopalpus humphreysi	4	4	Nearest collection is ~45 km north-west of Tower Hill.
Palpigradi	**1**	**1**	
Eukoeneniidae	**1**	**1**	
Eukoenenia guzikae	1	1	Nearest collection is ~45 km north-west of Tower Hill.
Pseudoscorpiones	**9**	**9**	
Panctenata	**3**	**3**	
Olpiidae	**3**	**3**	
Olpiidae `blind troglobite`	1	1	Nearest collection is ~45 km north-west of Tower Hill.
Olpiidae sp.	2	2	
Chthoniidae	**6**	**6**	
Lagynochthonius polydentatus	1	1	Nearest collection is ~45 km north-west of Tower Hill.
Tyrannochthonius `Helens Bore`	1	1	Nearest collection is ~45 km north-west of Tower Hill.
Tyrannochthonius billhumphreysi	4	4	Nearest collection is ~45 km north-west of Tower Hill.
Crustacea	**16**	**18**	
Malacostraca	**16**	**18**	

Lowest identification	No. records	No. individuals	Comments
Eumalacostraca	**16**	**18**	
Isopoda	**16**	**18**	
Isopoda sp.	1	1	
Ligiamorpha	**14**	**14**	
Platyarthridae	**14**	**14**	
Paraplatyarthrus \`BIS514\`	1	1	Nearest collection is 35 km south-east of Gwalia tenement.
Paraplatyarthrus occidentoniscus	13	13	Nearest collection is ~45 km north-west of Tower Hill.
Stenoniscidae	**1**	**3**	
Stenoniscidae gen. nov. \`BIS515\`	1	3	Nearest collection is ~45 km north-west of Tower Hill.
Myriapoda	**5**	**5**	
Chilopoda	**1**	**1**	
Scolopendrida	**1**	**1**	
Cryptopidae	**1**	**1**	
Cryptopidae sp.	1	1	Nearest collection is ~45 km north-west of Tower Hill.
Diplopoda	**1**	**1**	
Polyxenida	**1**	**1**	
Polyxenida sp.	1	1	Nearest collection is ~45 km north-west of Tower Hill.
Symphyla	**3**	**3**	
Symphyla sp.	3	3	Nearest collection is ~45 km north-west of Tower Hill.
Grand Total	**38**	**40**	

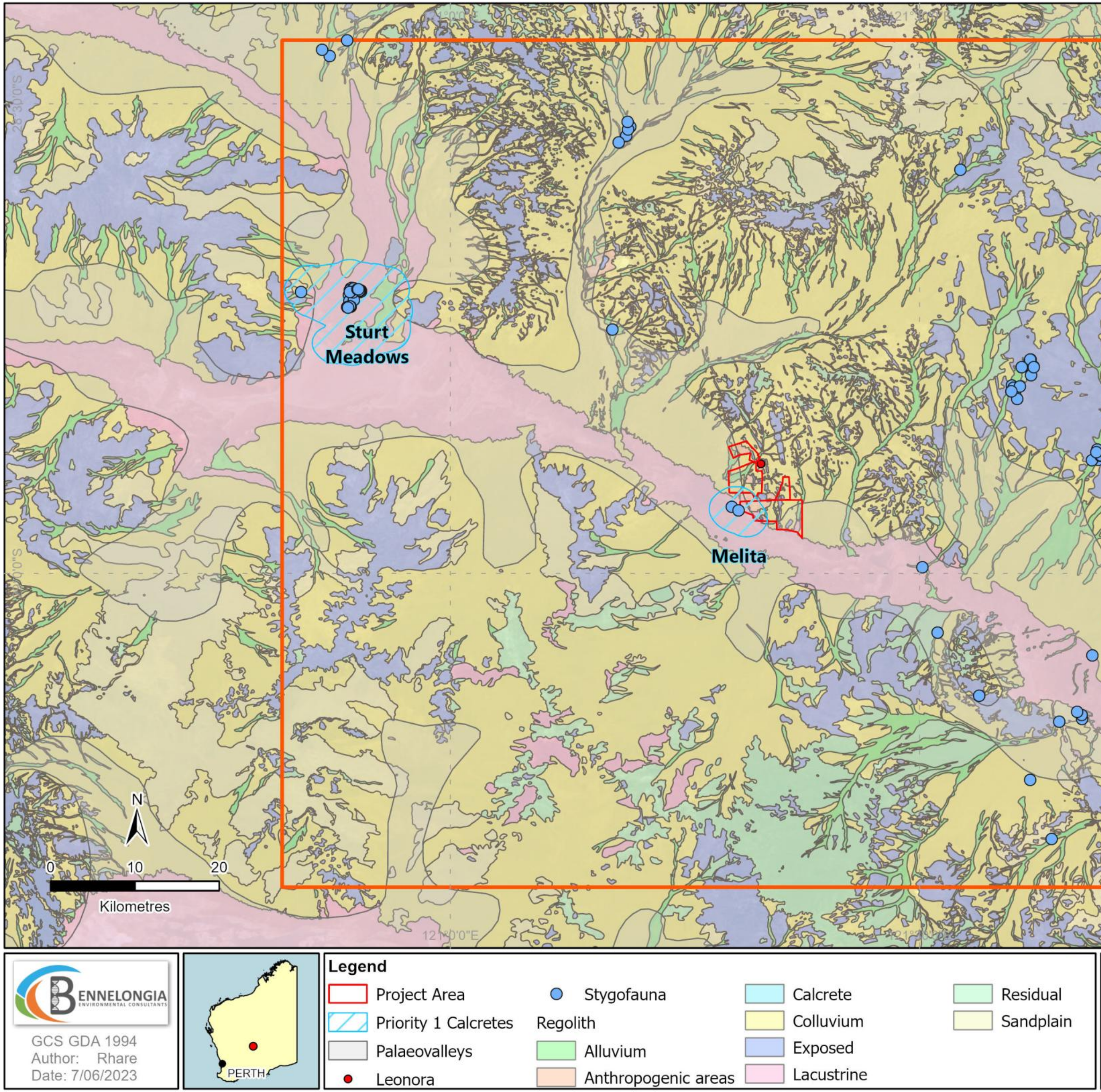
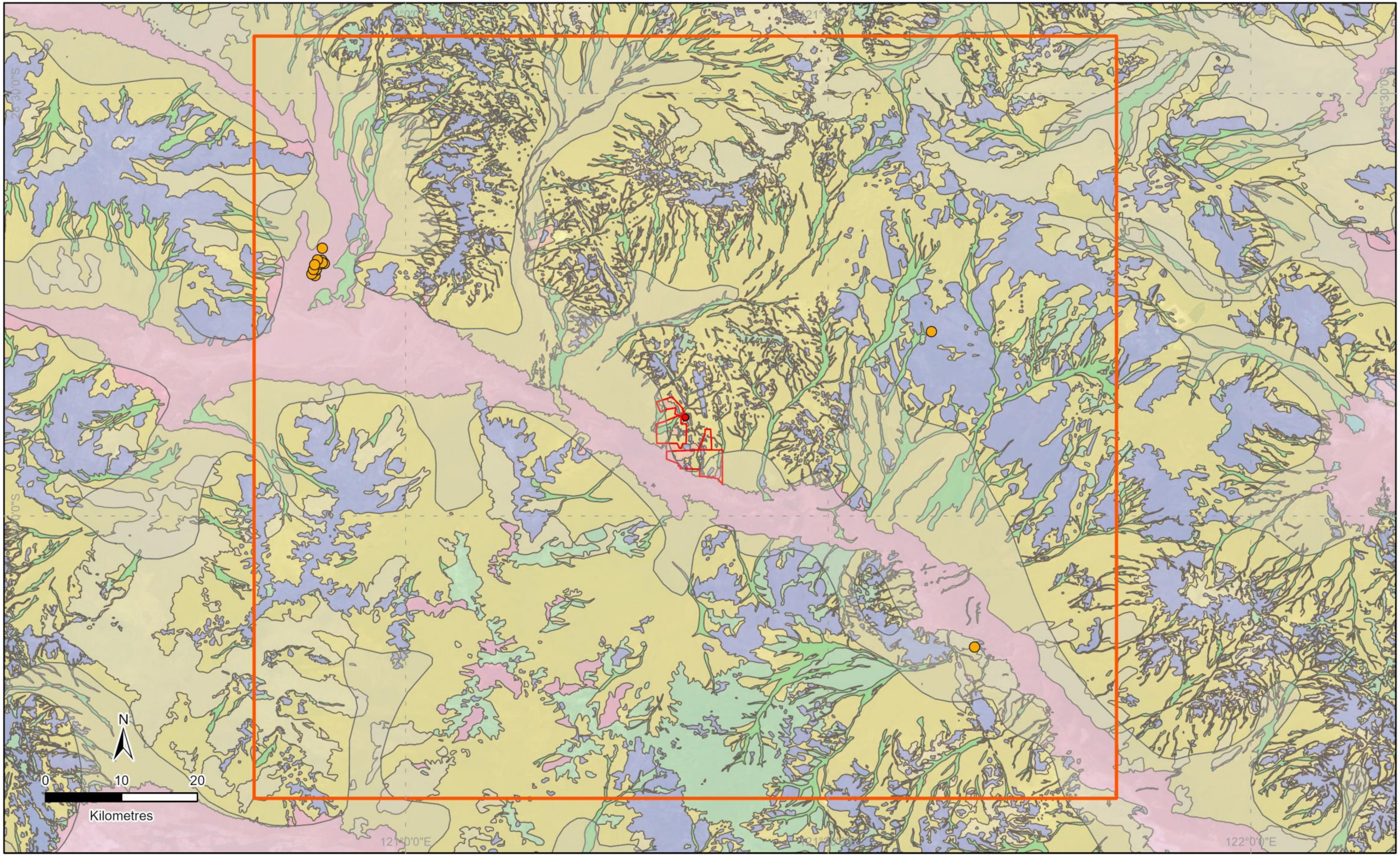


Figure 3. Stygofauna records recovered in the desktop search area.



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Date: 7/06/2023

Figure 4. Troglofauna records recovered in the desktop search area.

2.1.3. Discussion

The records recovered in the desktop search indicate that a moderately rich stygofauna community exists in the Raeside Palaeovalley, and that a more modest troglofauna community probably occupies the vadose zone above the palaeovalley. However, little is known about the presence or absence of such communities within the Project area specifically, due to the lack of historical sampling.

On balance, troglofauna are probably not present in the Project area. Any pre-existing troglofauna in the Project area have probably been extirpated as a result of mining operations conducted for over a century. The Project is not expected to affect troglofauna.

By contrast, it is highly likely that stygofauna occur in the Project area. The presence of a Priority 1 calcrete partially overlapping with the Project area indicates that significant stygofauna are present in the Project area. Moreover, apart from the anthropogenically disturbed areas of the Project, the regolith in the area is generally conducive to hosting stygofauna: calcrete, alluvium, and colluvium tend to be prospective for subterranean fauna, especially when overlying a palaeovalley as in this case.

Groundwater salinity varies substantially in the region of the Project (8,000-220,000 µS/cm), but in the lower reaches of the range is certainly conducive to hosting stygofauna. The suitability of the regolith and salinity combined with the proximity of the Priority 1 calcrete and palaeovalley to the Project area suggest that stygofauna occur close to or within the Project area but have not been surveyed. Basic survey is recommended to investigate whether stygofauna are present in the Project area, and to provide a preliminary characterisation of any assemblage detected.

3. SURVEY

3.1. Methods

3.1.1. Stygofauna Sampling

A basic stygofauna sampling program was undertaken at 10 bores in the Project area, with an additional 50 bores as part of the targeted stygofauna survey outside of the Project area, including reference sites within the Raeside Palaeovalley (Table 3 and Figure 5). Salinity among these bores was generally high and stable over time. Sampling across both surveys accounted for a total of 60 bores sampled, of which 23 were inside the Melita Calcrete PEC. Out of all the bores sampled, only 18 yielded stygofauna (Table 3).

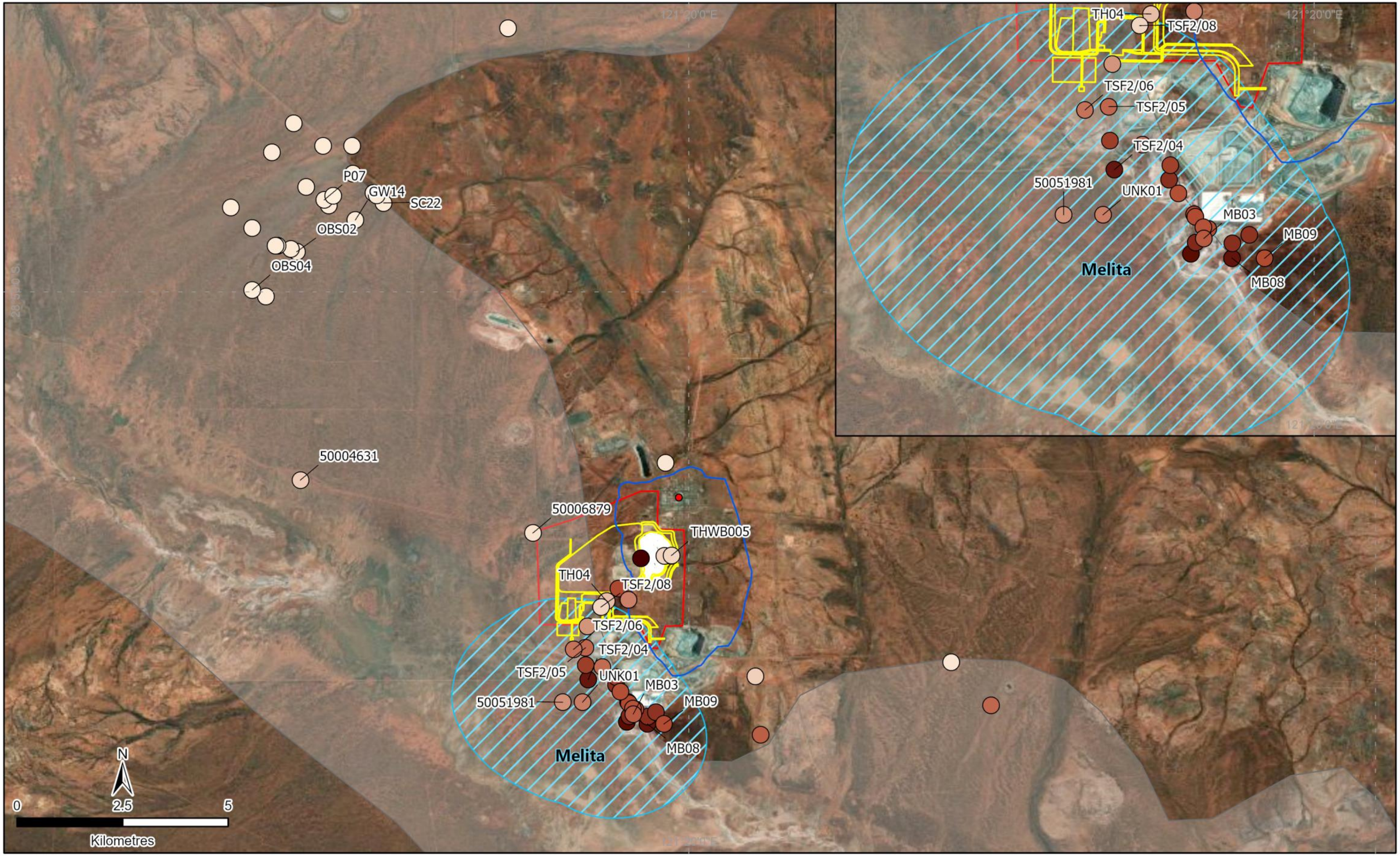
Sampling occurred on 30-31 March 2023 and 18-22 August 2025 and was carried out according to the methods specified by the EPA (2016a, 2016b, 2021). Six hauls using weighted plankton nets were taken at each bore, three using a 50-µm mesh net and three using a 150-µm mesh net. During each haul, the net was lowered to the bottom of the hole and oscillated vertically to agitate the benthos, increasing the likelihood of collecting benthic species, and then slowly retrieved. Contents of the net were transferred to a 125-ml polycarbonate vial after each haul, flushed with bore water to reduce fine sediment content, preserved in 100% ethanol, and refrigerated at a constant 4 °C. Nets were washed between holes to minimise site-to-site contamination.

In situ water quality parameters (temperature, electrical conductivity, and pH) were measured in each bore using a WP 81 field meter. Standing water level and total depth of hole were also measured using a Solinst water level meter. Contents of the net hauls were preserved in cold ethanol and returned to the laboratory in Perth for processing.

Troglofauna were not sampled.

Table 3. Drill holes sampled for stygofauna during the baseline and targeted field surveys. Note: only the boreholes that yielded samples are detailed below. SWL: standing water level (m). EOH: end of hole (m). Temp: temperature (° C). EC: electrical conductivity (µS/cm; 1 µS/cm = 0.64 mg/L TDS).

Borehole code	SWL (m)	EOH (max depth m)	Salinity (Ec/cm)	Temp (°C)	pH	Melita Calcrete PEC
50004631	2.07	3	15500	20.4	7.94	Outside
50006879	4.16	7.62	5580	21	7.54	Outside
50051981	3.45	20	41000	24	6.82	Inside
GW14	14.91	20.61	2840	24.8	7.13	Outside
MB03	2.63	6	64700	22.7	5.98	Inside
MB08	2.2	9	121900	25.3	5.68	Inside
MB09	3.95	10	71800	25.8	6.46	Inside
OBS02	13.6	19	4090	24.7	7	Outside
OBS04	10.36	24	918.7	24.7	6.89	Outside
P07	17.97	27	2225	25.2	7.26	Outside
SC22	13.92	17.57	2890	23.1	6.38	Outside
TH04	4.47	10	21700	25.7	6.06	Outside
THWB005	13.25	50	10800	22.3	6.48	Outside
TSF2/04	1.68	17.56	120100	21.8	5.25	Inside
TSF2/05	1.46	12	58800	23.3	6.12	Inside
TSF2/06	1.8	11	54300	20.4	6.74	Inside
TSF2/08	4.43	14.6	11500	23.1	7.53	Inside
UNK01	2.5	30	49800	23.4	6.73	Inside



BENNELONGIA ENVIRONMENTAL CONSULTANTS

GCS GDA 1994
Author: K. Sagastume
Date: 30/03/2026

Legend

- Project Area
- Tower Hill LOM Impact area
- Tower Hill NVCP
- Priority 1 Calcretes
- Palaeovalleys
- Leonora

Ec/cm
450
140,000

End of mine 2m dewatering contour

Figure 5. Boreholes sampled for stygofauna across the baseline and targeted surveys. Degree of colouration corresponds with electrical conductivity (μS/cm).

Note: only bores that yielded samples are labelled. Inset shows close-up to the Melita PEC.

3.1.2. Laboratory Processing

In the laboratory, samples were elutriated to separate out heavy sediment particles and sieved into size fractions using 250-, 90-, and 53-µm screens. Samples were sorted under a dissecting microscope and, where necessary, dissected and examined under a differential interference contrast compound microscope. Specimens were identified to described species where possible using available keys and species descriptions. In many cases among subterranean fauna, species descriptions and taxonomic frameworks are lacking. In these cases, specimens may be identified morphologically and/or genomically as belonging to new species that await formal description; such species are usually assigned placeholder codes (e.g. 'B01'). In other cases, when the taxonomic framework is exceptionally poor and/or the specimen in question is damaged, juvenile, or of the nondiagnostic sex, the specimen is classified to the lowest level possible, but this level is usually higher than species. These specimens often carry the miscellaneous designation "sp."

3.1.3. Molecular Methods

Ten specimens from the survey were sent for sequencing to improve taxonomic resolution. For all samples, DNA was extracted using a Qiagen DNeasy Blood & Tissue kit (Qiagen 2006). For smaller animals, legs and other body parts (e.g. sections of the abdomen) were used for DNA extraction. For larger animals, and where possible, muscle tissue was collected from the legs. Elute volumes varied from 50 µL to 100 µL, and were dependent on the age, condition, and quantity of material available.

Primer combinations used for PCR amplifications were LCO1490:HCO2198, C1J1718:HCO2198, and LCO1490:HCOoutout, targeting the COI region of the mitochondrial genome; and 16SAR-L:16SBR-H targeting the 16S gene (Folmer *et al.* 1994; Schwendinger and Giribet 2005). PCR products were sequenced using dual-direction Sanger sequencing carried out by the Australian Genome Research Facility (AGRF). The returned sequences were edited and aligned manually in Geneious (version 2022.2.2; Kearse *et al.* 2012). Geneious was also used to calculate neighbour-joining phylogenetic trees with 1,000 bootstrap permutations.

Tamura-Nei genetic distances were measured as uncorrected *p*-distances (total percentage of nucleotide differences between squares). Sequences on GenBank and in grey literature were included in the phylogenetic analysis to provide a framework for assessing intra- and interspecific variation.

3.1.4. Personnel

Field work was carried out by Vitor Marques, Jim Cocking, Leila McCaughan and Jaxon Haines. Samples were sorted in the laboratory by Megan Lewis, Georgia Rice, Will Baxter, Emily Stout, Melita Pennifold and Jaxon Haines. Stygofauna dentifications were carried out by Jane McRae and Megan Lewis. Molecular extraction was carried out by Heather McCletchie and analysis by Dan White.

3.2. Results

Sequencing was successful in 5 of 10 specimens sent for sequencing (Table 4); in the remainder, small body size and/or degradation of tissue probably caused the sequencing failure. Among the successfully sequenced specimens, the original morphological identification was supported in four of five cases. For the final specimen, the morphological identification of *Australocamptus similis* s.l. was updated to *Australocamptus hamondi* as a result of molecular analysis. All subsequent results and discussion consider only these final, post-molecular identifications.

In total, 682 specimens attributable to at least 30 species were collected (Table 5; Figures 6 & 7). Most of the identified species were crustaceans, but there were some oligochaete annelids, beetles, and miscellaneous roundworms. Of the 30 putative species, 14 were recovered during the baseline survey, 9 from the targeted survey, and 7 from across both surveys.

Twenty-three species have been recorded from within the Melita Calcrete PEC while 10 species have been recorded outside of the PEC (including 3 species found inside and outside of the PEC) (Table 5).

Stygofauna were collected from 18 of the 60 surveyed bores. The most saline and the least saline bores (THWB007 and STJ01, respectively) did not yield any stygofauna samples. Of the 18 bores that did yield samples, salinity ranged from 918-121,900 µS/cm (Table 3). Nine of the bores that yielded samples were found inside the Melita Calcrete PEC, with the remaining nine found outside of the PEC.

The most diverse borehole was TSF2/04 with 13 species from 112 specimens despite also being one of the most saline boreholes that yielded samples (120,100 µS/cm). The second most diverse borehole was UNK01 with 50 specimens of 11 species (49,800 µS/cm, approximately the concentration of seawater). Both boreholes are located near the centre of the Melita Calcrete (Figure 6). Outside the calcrete, the most diverse bores were GW14 (2,840 µS/cm) with 4 species from 44 specimens and OBS02 (4,090 µS/cm) with 4 species from 14 specimens.

3.3. Discussion

3.3.1. Survey Findings

The survey indicates that despite relatively high salinity levels in and around the Project area, a rich assemblage of stygofauna occurs at least in the Melita Calcrete, which partially overlaps the Project area. Most (23/30) species occur within the Priority 1 Melita Calcrete, while 7 species occur outside of the Melita Calcrete. Findings suggest that the stygofauna community occurring at the Melita Calcrete is different from the one identified from the reference bores within the Raeside Palaeovalley (Table 5; Figures 6 & 7).

Twelve species are only known from either single sites or singleton specimens (Table 5). All but one, the harpacticoid amphipod *Nitocrella* \`BHA368\`, have been collected from within the Melita Calcrete PEC. *Nitocrella* \`BHA368\` was represented by a singleton collected from a bore with relatively low salinity (10,800 µS/cm), and outside both Melita Calcrete and the Raeside Palaeovalley. Although the single specimen of *N.* \`BHA368\` was collected just outside the margin of the mine pit, its habitat and therefore probably distribution extend beyond the mine pit and into the Raeside Palaeovalley. It is therefore, not expected to be negatively affected by Project development. None of the remaining 11 species intersect the proposed 2 m end of mine dewatering contours and are unlikely to be affected by the Project development.

Several factors probably interact to generate the high diversity found. Despite generally being high, the salinity varied across the calcrete's extent, suggesting subdivisions or salinity gradients occur within the calcrete, which can drive diversity (Humphreys *et al.* 2009). For example, the stygal diving beetles *Limbodessus melitaensis* and *L. micromelitaensis* co-evolved in the Melita Calcrete, the type and only known locality of both species (Watts and Humphreys 2006; Watts and Humphreys 2009). Despite both being predators, the two species probably target different prey and/or occupy different salinities (Austin *et al.* 2023). Indeed, species of stygal beetles are almost always restricted to a single calcrete, but often share that calcrete with one, sometimes two, and rarely three other species (Austin *et al.* 2023; Bradford *et al.* 2013b).

Similar patterns of closely related species co-existing in shared habitats occur elsewhere in the Raeside Palaeovalley. In the Sturt Meadows calcrete 36 km north-west of the Project, the three chiltoniids listed in Table 1 (*Scutachiltonia axfordi*, *Stygochiltonia bradfordae*, and *Yilgarniella sturtensis*) are morphologically indistinguishable but are divergent at the genus level genetically (King *et al.* 2012). Considering that many subterranean species originate from epigean species that become permanently trapped belowground, these species probably began as relatively small populations isolated in separate areas within the host calcrete. Genomic evidence suggests that the populations subsequently expanded to occupy most of the calcrete and to overlap with one another but remained genetically discrete (Bradford *et al.* 2013a; Saccò *et al.* 2020).

3.3.2. Melita PEC Hydrogeology

Following the RFI issued by the Department, Genesis contacted Pennington Scott (groundwater consultants) to review the hydrogeological data within the Melita PEC to better define the potential for subterranean fauna habitat.

In their report, Pennington Scott (2025) highlighted the importance of calcrete deposits as habitat for stygofauna, particularly as aquatic invertebrates inhabit voids and interstitial pore spaces of aquifers. Stygofauna communities tend to be highly diverse within the calcretes of palaeodrainages systems as isolation between fresh to brackish groundwater zones, in addition to separation by hypersaline water, generally drives high levels of endemism (Humphreys 1999). It's the isolation of the specific groundwater habitats that drives the evolution of localised stygofauna, with most species occurring where groundwater salinity remains below about 35,000 mg/L, with higher salinities limiting species diversity and distribution. Although aquifers with high salinity do not generally provide suitable habitat for stygofauna (e.g. Halse *et al*. 2014), some species are halophiles and stygofauna may be found in many hypersaline situations (Schulz *et al*. 2013; Outback Ecology 2011).

The definition of the Melita PEC boundary appears to have been defined using an arbitrary 2 km buffer around four production bores within the Western Borefield located in deposits of the Raeside Palaeodrainage where stygofauna was detected prior to the year 2000's. Although original drill logs from the Western Borefield are unavailable, evidence suggesting calcretisation within the alluvial deposits seems to exist (Pennington Scott 2025). Pennington Scott (2025) suggested that the eastern margin of the Melita Calcrete PEC extends into areas of hypersaline weathered bedrock with low suitability for stygofauna, with potential stygofauna habitat likely to be confined to zones of calcretised alluvium and alluvial sands and gravels in the topmost layers of the surficial aquifer as groundwater becomes hypersaline with depth. However, results of the baseline and targeted surveys suggest salinity is not likely to constrain stygofauna species distributions.

Baseline and targeted survey results suggest that stygofauna are likely to be constrained to what has been identified in Pennington Scott (2025) as the "calcrete possible" area (see Figure 2 in Pennington Scott 2025) which is found towards the centre and western sections of the PEC. Only three of the boreholes sampled in the eastern section of the PEC yielded stygofauna (Table 5), with only 1 or 2 species and 3 or fewer specimens. This conforms with Pennington Scott's (2025) suggestion that stygofauna species richness and abundance are lower in the eastern section of the PEC.

Table 4. Results of molecular analysis.
Orange highlighting indicates an identification that was changed using molecular evidence. Grey highlighting indicates a specimen for which sequencing was unsuccessful. Alphanumeric strings preceded by # are GenBank accession codes.

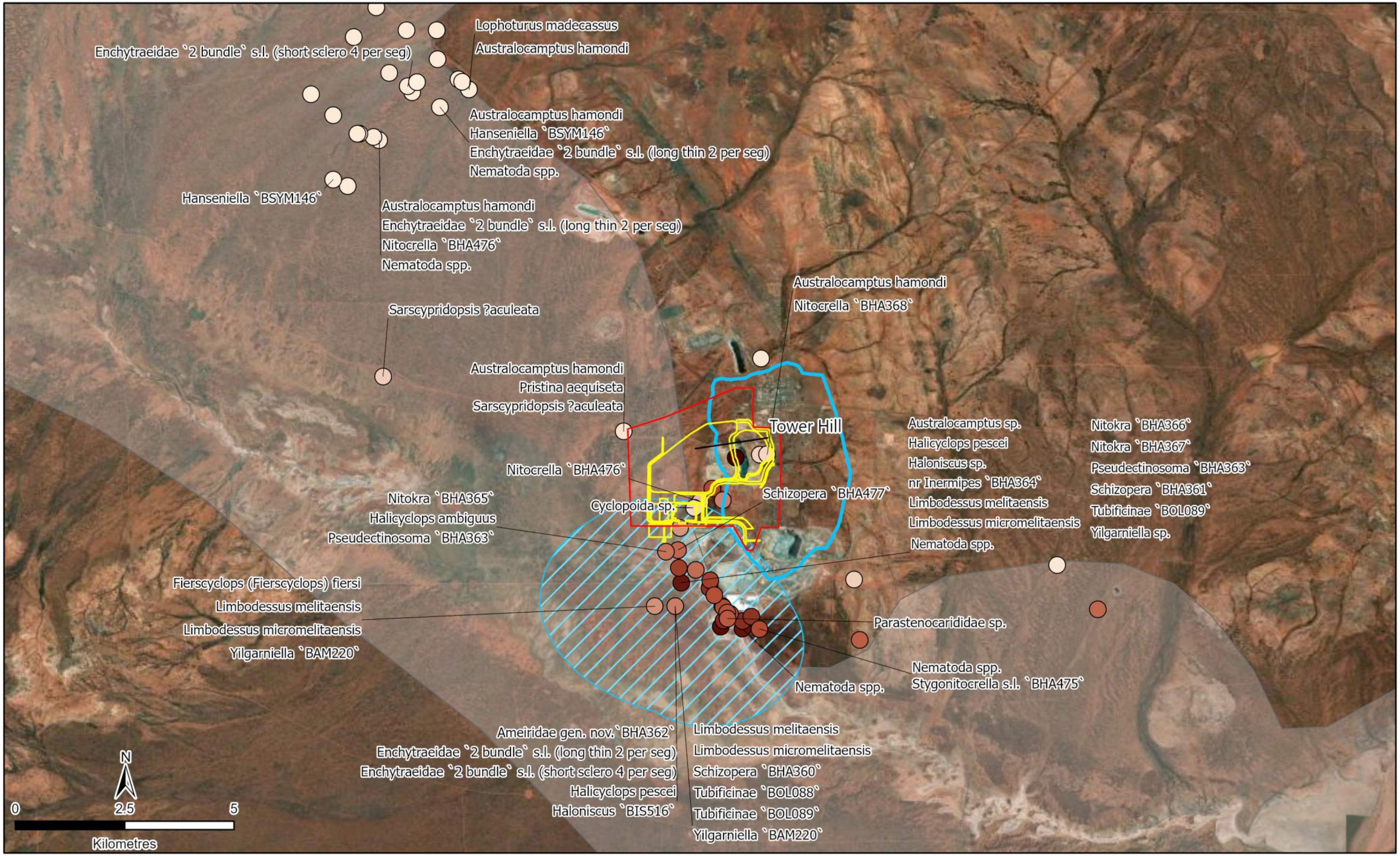
Morphological Identification	Drill Hole	Updated Identification	Comments
Yilgarniella \`BAM220\`	UNK01	*Yilgarniella* \`BAM220\`	At least 8% divergent from the closest known referent on GenBank (Chiltoniidae sp. SW2b isolate YBWA_CW410_1, #KT958044). New species code conservatively retained.
Halicyclops ambiguus	TSF2/06		
Halicyclops pescei	UNK01	*Halicyclops pescei*	92.5% similarity with a specimen (Harpacticoida sp. TB-2009 ABTC:104230, #FJ785772) from 78 km south-east that is almost certainly the same species.
Halicyclops pescei	TSF2/04		
Australocamptus similis s.l.	THWB005	*Australocamptus hamondi*	94.5% identity to *Australocamptus hamondi* isolate 11508 (#ON931468).
Nitokra \`BHA366\`	TSF2/04		
Nitokra \`BHA367\`	TSF2/04		
nr *Inermipes* \`BHA364\`	TSF2/04		
Pseudectinosoma \`BHA363\`	TSF2/04		
Haloniscus \`BIS516\`	UNK01	*Haloniscus* \`BIS516\`	At least 20% divergent from all referents in GenBank or in the Bennelongia database. New species code retained.

Table 5. Subterranean fauna recovered during the baseline and targeted field surveys.
No. individuals refer to the number of individuals recorded across all records. Red highlighting indicates a species is only known from the Melita Calcrete PEC; grey highlighting indicates higher order identifications; "*" represents records not considered individual species as they may be representatives of species already listed; blue highlighting indicates troglofauna species.

Higher order ID	Lowest Identification	No. Specimens (Sites)	Distribution	Collection Round	Collection Sites	Inside PEC	Outside PEC
Nematoda	Nematoda spp.	20 (5)		Baseline/Targeted	GW14; MB08; MB09; OBS02; TSF2/04	Yes	Yes
Annelida							
Clitellata							
Tubificida							
Naididae	Tubificinae `BOL088`	1 (1)	Singleton	Baseline	UNK01	Yes	
	Tubificinae `BOL089`	3 (2)	0.63 km	Baseline	TSF2/04; UNK01	Yes	
	Pristina aequiseta	4 (1)	Widespread	Targeted	50006879		Yes
Enchytraeida							
Enchytraeidae	Enchytraeidae `2 bundle` s.l. (long thin 2 per seg)	11 (3)	Widespread	Baseline/Targeted	GW14; OBS02; UNK01	Yes	Yes
	Enchytraeidae `2 bundle` s.l. (short sclero 4 per seg)	3 (2)	Widespread	Baseline/Targeted	P07; UNK01	Yes	Yes
Arthropoda							
Ostracoda							
Podocopida							
Cyprididae	*Sarscypridopsis ?aculeata*	94 (2)	60.61 km	Targeted	50004631; 50006879		Yes

Maxillopoda							
Cyclopoida	*Cyclopoida sp.	1 (1)		Baseline	TSF2/08	Yes	
Cyclopidae	*Halicyclops ambiguus*	110 (1)	Widespread	Baseline	TSF2/06	Yes	
	Halicyclops pescei	17 (2)	0.63 km	Baseline	TSF2/04; UNK01	Yes	
	Fierscyclops (Fierscyclops) fiersi	1 (1)	Widespread	Targeted	50051981	Yes	
Harpacticoida							
Ameiridae	*Nitocrella* \`BHA368\`	1 (1)	Singleton	Baseline	THWB005		Yes
	Nitocrella \`BHA476\`	26 (2)	11.94 km	Targeted	OBS02; TH04		Yes
	Nitokra \`BHA365\`	1 (1)	Singleton	Baseline	TSF2/06	Yes	
	Nitokra \`BHA366\`	5 (1)	Single site	Baseline	TSF2/04	Yes	
	Nitokra \`BHA367\`	15 (1)	Single site	Baseline	TSF2/04	Yes	
	Ameiridae gen. nov.\`BHA362\`	2 (1)	Single site	Baseline	UNK01	Yes	
	nr *Inermipes* \`BHA364\`	20 (1)	Single site	Baseline	TSF2/04	Yes	
	Stygonitocrella s.l. \`BHA475\`	2 (1)	Single site	Targeted	MB09	Yes	
Canthocamptidae	**Australocamptus* sp.	1 (1)		Baseline	TSF2/04	Yes	
	Australocamptus hamondi	213 (5)	Widespread	Baseline/Targeted	50006879; GW14; OBS02; SC22; THWB005		Yes
Ectinosomatidae	*Pseudectinosoma* \`BHA363\`	11 (2)	0.88 km	Baseline	TSF2/04; TSF2/06	Yes	
Miraciidae	*Schizopera* \`BHA360\`	1 (1)	Singleton	Baseline	UNK01	Yes	
	Schizopera \`BHA361\`	2 (1)	Single site	Baseline	TSF2/04	Yes	

	Schizopera `BHA477`	1 (1)	Singleton	Targeted	TSF2/05	Yes	
Parastenocarididae	Parastenocarididae sp.	1 (1)		Targeted	MB03	Yes	
Malacostraca							
Amphipoda							
Chiltoniidae	**Yilgarniella* sp.	1 (1)		Baseline	TSF2/04	Yes	
	Yilgarniella `BAM220`	36 (2)	0.47 km	Baseline/Targeted	50051981; UNK01	Yes	
Isopoda							
Scyphacidae	**Haloniscus* sp.	4 (1)		Baseline	TSF2/04	Yes	
	Haloniscus `BIS516`	2 (1)	Single site	Baseline	UNK01	Yes	
Diplopoda							
Polyxenida							
Lophoproctidae	*Lophoturus madecassus*	1 (1)	Widespread	Targeted	SC22		Yes
Symphyla							
Cephalostigmata							
Scutigerellidae	*Hanseniella* `BSYM146`	3 (2)	3.08 km	Targeted	GW14; OBS04		Yes
Insecta							
Coleoptera							
Dytiscidae	*Limbodessus melitaensis*	59 (3)	0.86 km	Baseline/Targeted	50051981; TSF2/04; UNK01	Yes	
	Limbodessus micromelitaensis	9 (3)	0.86 km	Baseline/Targeted	50051981; TSF2/04; UNK01	Yes	
Grand Total		682					



BENNELONGIA ENVIRONMENTAL CONSULTANTS

GCS GDA 1994
Author: K. Sagastume
Date: 30/03/2026

Legend

- Project Area
- Tower Hill NVCP
- Priority 1 Calcretes
- Palaeovalleys
- End of mine 2m dewatering contour

Bores sampled baseline and targeted surveys

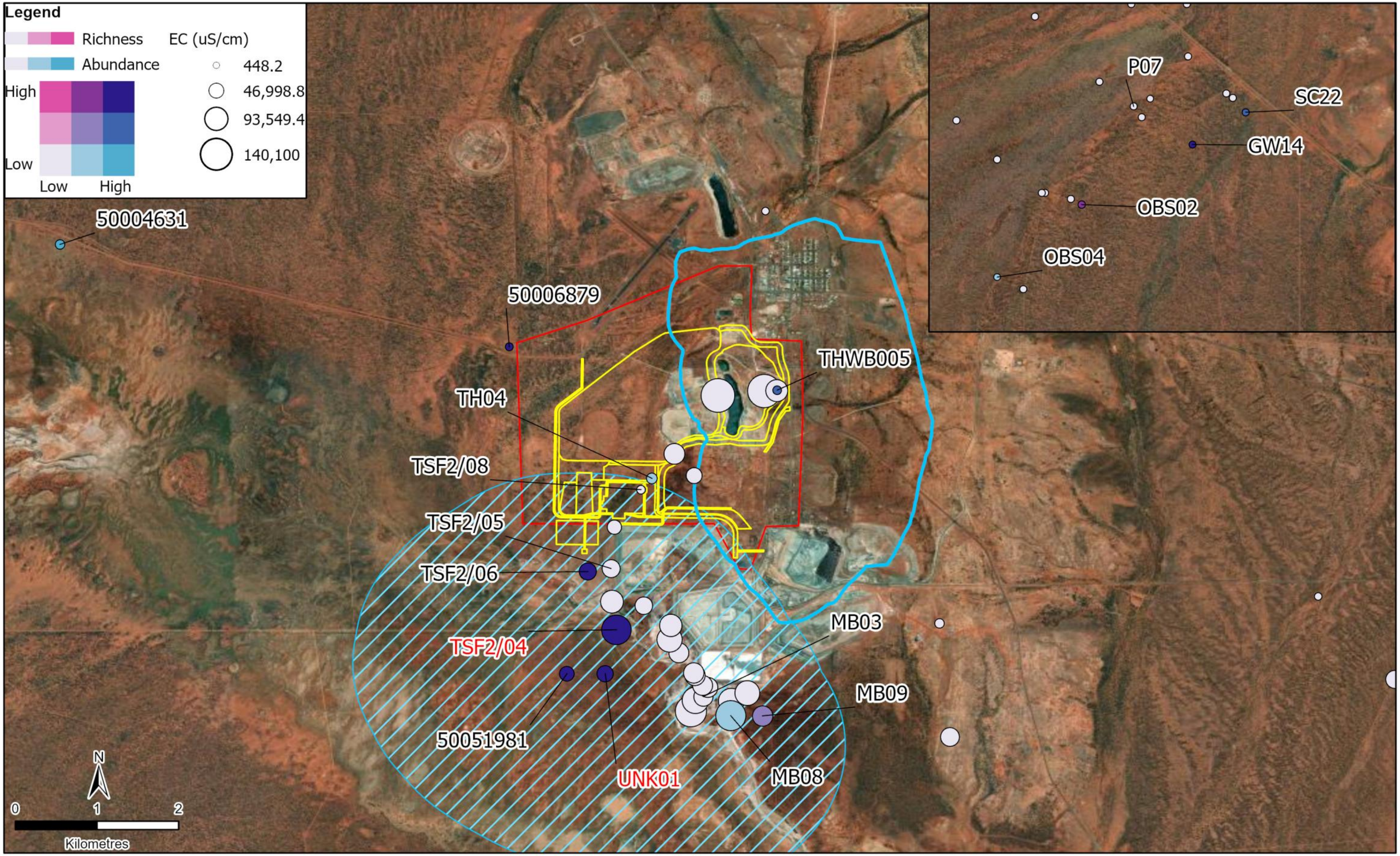
Ec/cm

450

140,000

Figure 6. Stygofauna collected between both rounds (baseline and targeted) of survey.

Degree of colouration in boreholes corresponds with electrical conductivity (µS/cm).



BENNELONGIA ENVIRONMENTAL CONSULTANTS

GCS GDA 1994
Author: K. Sagastume
Date: 30/03/2026

PERTH

Legend

- Project Area
- Tower Hill NVCP
- Priority 1 Calcretes
- End of mine 2m dewatering contour

Figure 7. Stygofauna richness and abundance in relation to salinity within the survey sites around the Tower Hill Project area.

Inset shows the boreholes within the buffer area 15 km from the Project area.

3.4. Conclusion

Overall, the small size (2.5 km^2, the smallest of any calcrete known in the Yilgarn) and geographic isolation of the Melita Calcrete probably contributed to generating a rich stygofaunal community. This richness was reflected in the results of the survey. The stygofaunal community identified through the surveys also appears to have acclimated to historical changes in groundwater conditions associated with over a century of mining at Gwalia. Significant groundwater drawdown occurred during the initial establishment of the Gwalia mine pit, and the additional 2m drawdowns predicted for the Project will affect only a small portion of the Melita Calcrete PEC at its eastern margin (Figure 6). This area is likely to overlap with sections of the PEC already influenced by historical mining activity. While the greatest drawdowns are expected to occur at the northeast of the Project, primarily confined to mafic formations which provide most of the dewatering yield, vegetation clearing will extend into southeastern sections of the Melita PEC. Propagation of drawdown to the west is expected to be minimal due to impermeable granite bedrock and the Gwalia TSF, both of which act as hydraulic barriers (Pennington Scott 2024).

Despite the high levels of salinity in the Melita Calcrete groundwater, the PEC supports a diverse and rich assemblage of stygofauna. The tolerance of this community to elevated salinity is exemplified by bore TSF2/04, which recorded the highest species richness and second-highest overall abundance while exhibiting one of the highest salinity levels (120,100 µS/cm) of all bores that yielded stygofauna (Table 3). Similarly, the second-most speciose bore (UNK01) and the most abundant bore (TSF2/06) also exhibited high salinities 49,800 µS/cm and 54,300 µS/cm, respectively (Table 3). Combined baseline and targeted survey results therefore indicate that salinity is unlikely to be a key factor constraining stygofauna distribution within the PEC.

Survey data also indicate that the stygofauna community within the Melita Calcrete differs from that recorded in reference bores in the Raeside Palaeovalley (Figure 7). Species richness and abundance were lowest in the eastern section of the PEC, with only three bores in this area yielding stygofauna. These findings support the conclusion that the eastern margin of the PEC contains comparatively lower stygofaunal values.

Based on the information presented in this assessment, the expected impact of the Project activities on stygofauna is minor. The areas of the PEC most likely to be directly or indirectly affected, primarily the eastern and northern sections, appear to support the lowest richness and abundance of stygofauna. Accordingly, despite the unexpectedly high overall diversity recorded during the survey, the Project is unlikely to affect the conservation values of the Melita Calcrete PEC stygofauna community.

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