

# Minara Resources Murrin Murrin Operations



## *Irwin Hills Nickel and Cobalt Project*

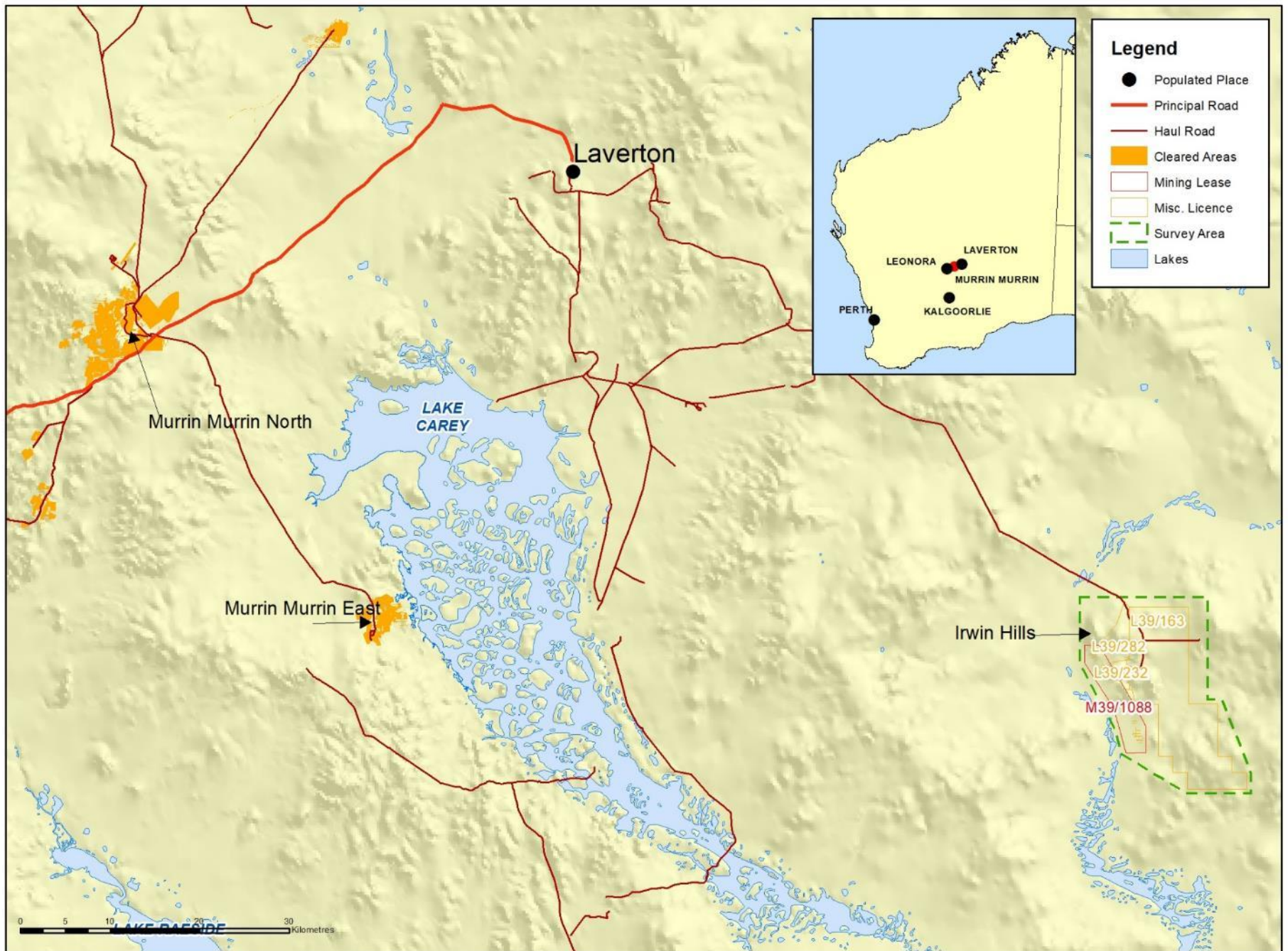


# Outline

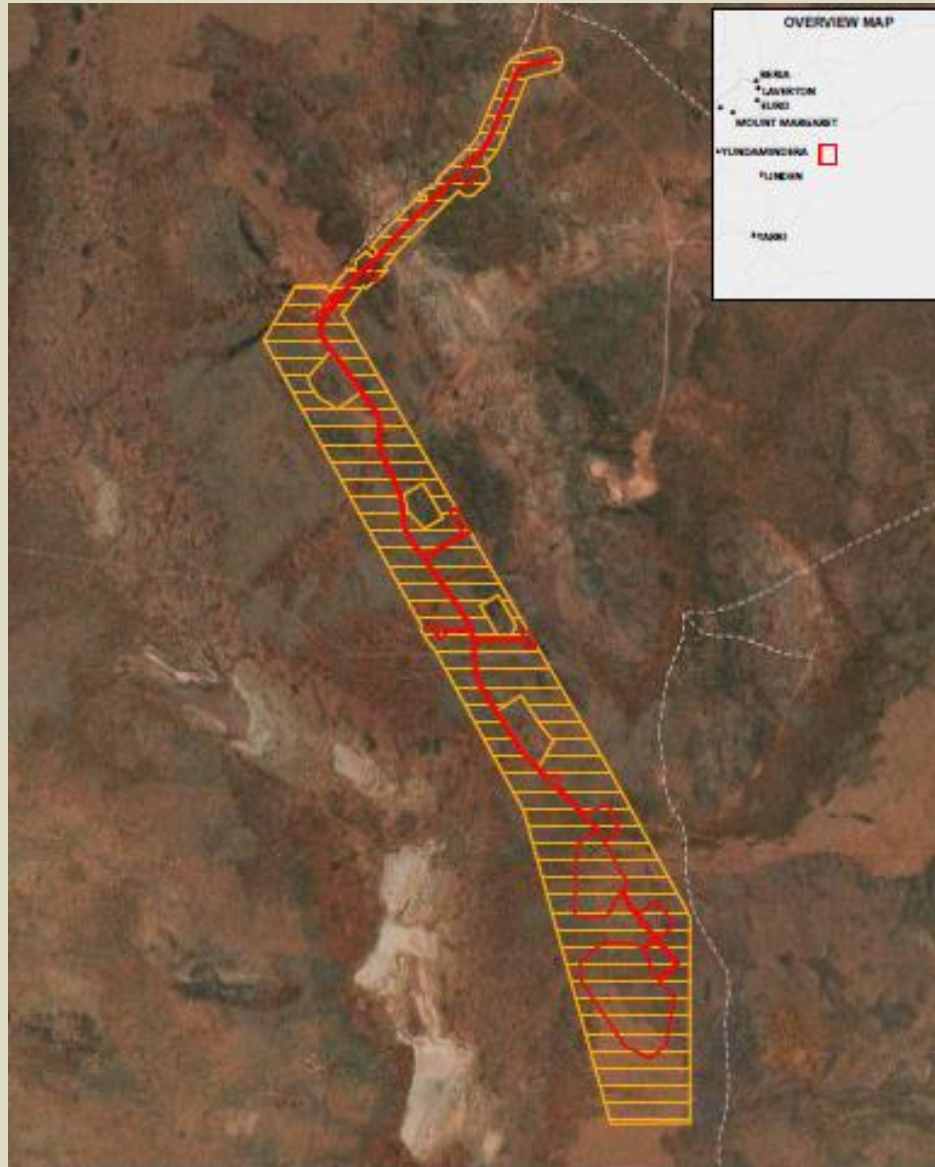
- **Irwin Hills Project Overview**
- **Environmental Studies completed**
- **Receiving Environment**
- **Anticipated Impacts**
- **Proposed Management and Mitigation**

# Irwin Hill Project - Overview

- Located 80 km east of Laverton, 120 km south east of the main Murrin Murrin project (see Slide 3)
- Disturbance Envelope (DE) of 1,826 ha
- Initial Exploration drilling has been completed (72 ha cleared)
- Grade control drilling to prove resource
- Requires clearing of 312 ha of native vegetation
- Other requirements included:
  - Access road
  - Borrow pits
  - Temporary accommodation and workshop facilities

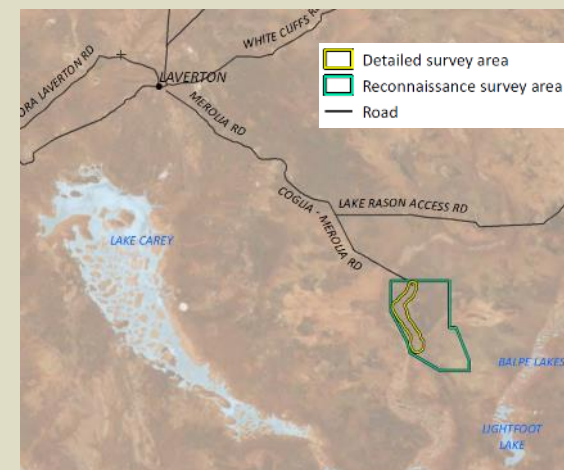


# Irwin Hills Project DE



# Irwin Hills Project – Environmental Studies

- Reconnaissance survey area (RSA) = 24,193 ha
- Detailed survey area (includes DE) (DSA) = 4,625 ha



Factor	Survey Type	Timing
Flora and Vegetation	Reconnaissance	Aug 2019
	Detailed	Nov 2019
	Detailed	Mar – Apr 2020
	Reconnaissance	Mar – Apr 2020
	Targeted significant flora	Sep 2020
Terrestrial Fauna (including SRE)	Reconnaissance	Aug 2019
	Detailed	Sept – Nov 2019
	Detailed	May 2020

# Receiving Environment – Flora and Vegetation

- Vegetation condition ‘Excellent’ to ‘Good’
- Vegetation types – six considered significant and well represented outside the DE
- No Threatened flora were recorded
- No TECs were recorded
- Two Priority flora were recorded outside the DE, one range extension and four significant flora that potentially represent new species
- No introduced flora

# Receiving Environment - Fauna

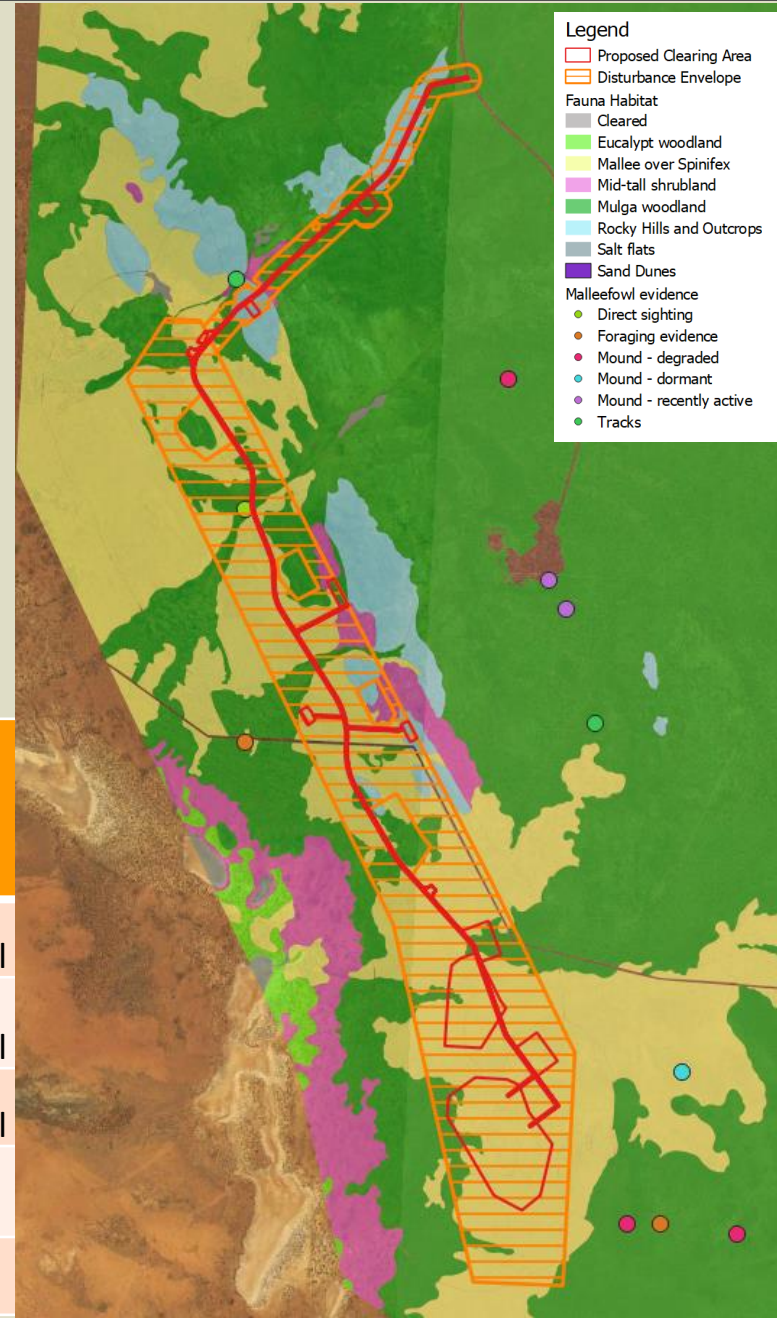
- Two significant fauna:
  - Malleefowl (Vulnerable)
    - Individual sighting, recently active mound, inactive mounds, foraging tracks
    - Sparsely distributed across DSA and RSA
    - Direct sightings only recorded in the DE
  - Central Long-eared Bat (P3) – records only
- Fauna habitat – structurally uniform, regionally widespread
- Invasive species – cat, dog and cattle



# Receiving environment – Fauna Habitat

- Sparse records with breeding observed in Mulga Woodland
- Wide area of suitable habitat

Fauna habitat	Survey Area	DE	Proposed Layout	% Impacts from Proposed Layout	Species habitat
Mulga Woodland	16,616	404.8	45.1	0.27%	Malleefowl
Mallee over spinifex	9262	1283.9	254.4	2.75%	Malleefowl
Mid-tall shrubland	571	31.6	1.36	0.24%	Malleefowl
Rocky Hills and Outcrop	558	9	10.94	1.96%	
Cleared	200	12.5	0.15	0.08%	



# Irwin Hills Project – Anticipated Impacts

- Direct
  - Loss of 312 ha native vegetation that is potential habitat for Malleefowl
  - Equipment strikes – fauna injury or mortality
- Indirect
  - Fragmentation of fauna habitat
  - Displacement – fire, grade control operations
  - Introduced species – animal and weeds
  - Dust, light, noise, vibration

# Irwin Hills Project – Malleefowl proposed management

- Implementation of Malleefowl Management Plan provisions:
  - Avoid clearing active mounds – 50 m buffer
  - Preferential clearing outside breeding season with fauna spotter
  - Pre-clearance surveys if clearing during breeding season
  - Minimise vehicle strikes (speed controls)
  - Minimise predation (resource reduction - waste removal, security of water supplies/storage and predator control programmes as required)
  - Reduce risk of fire and weeds
  - Reduce generation of noise, dust, light

# Irwin Hills Project – Significance Assessment

- Population not considered important – sparsely populated and unlikely to be regionally important with suitable habitat throughout bioregion
- Fragmentation considered unlikely as:
  - Extensive clearing is not required
  - Species is mobile and can utilise variety of habitats
  - No permanent loss as area will be rehabilitated, unless project proceeds
- Project will not adversely impact critical habitat with Project impacts to 1.2% of mapped suitable habitat
- No disruptions to breeding cycle with closest recently active mound 2.5 km away and clearing proposed outside main breeding season, if possible
- Project will not result in invasive species or diseases with Malleefowl Management Plan developed
- Mitigation measures result in Project impact not considered significant