

# **EA Amendment Supporting Information Report**

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EA HOLDER: CHINOVA RESOURCES OSBORNE PTY LTD

EA HOLDER CONTACT: 9/303 CORRONATION DRIVE, MILTON 4064

PREPARED FOR: CHINOVA RESOURCES OSBORNE PTY LTD



**WULGURU TECHNICAL  
SERVICES**

## Contact Details

Company	Wulguru Technical Services Pty Ltd
Project Manager	Madison Jackson
Email	madison@wulgurutechservices.com.au
Mail	PO Box 2553 IDALIA QLD 4810
ABN	79 644 301 655



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## Document Control and History

Version	Date	Description	Prepared By	Reviewed By
V.01	6/05/2025	Draft for client review	Sean Vlok	Madison Jackson
V.02	13/06/2025	Draft for client review	Sean Vlok	Debbie Coutts
V1.0	20/06/2025	Final	Sean Vlok	Madison Jackson
V2.0	9/09/2025	Change application	Madison Jackson	Debbie Coutts

## Citation

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## Executive Summary

Wulguru Technical Services (WTS) was engaged by Chinova Resources Osborne Pty Ltd (Chinova), the owners and operators of the Osborne Mine (the Project), to prepare supporting information for an amendment to Environmental Authority (EA) EPML00873613. This application provides a detailed response to the following guidelines:

- *Application requirements for activities with impacts to air* (DETSI, 2024b).
- *Application requirements for activities with impacts to land* (DETSI, 2024c).
- *Application requirements for activities with impacts to water* (DETSI, 2024d).
- *Application requirements for activities with noise impacts* (DETSI, 2024e).
- *Application requirements for activities with waste impacts* (DETSI, 2024f).
- *Approval processes for Environmental Authorities* (DETSI, 2024g)

This amendment proposes to modify authorised disturbances detailed within EA Table A1 – Authorised Disturbance to accurately reflect existing on-ground disturbances. No additional disturbance is proposed as part of this amendment.

The proposed amendment has been determined to be of negligible risk to all environmental values. Existing controls can continue to be implemented to maintain the level of risk to as low as reasonably practicable.

The below table has been prepared for the benefit of the Department of Environment, Tourism, Science and Innovation, outlining the revisions made between version 1.0 and 2.0 of this EA Amendment Supporting Information Report.

#### Revision Summary

Section	Revision
1.	EA date revised to 23 July 2025 following de-amalgamation of Trekelano.
1.2	Reference to Trekelano, relevant pastoral holdings and lots, and Trekelano mining leases removed.  Trekelano removed from Figure 1.
2.1	EA date revised to 23 July 2025 following de-amalgamation of Trekelano.  Reference to Trekelano Topsoil Stockpile removed.
2.2	Trekelano features removed from Table 3 and Table 4.
2.3	Reference to Trekelano and the Trekelano Topsoil Stockpile removed.  Trekelano features removed from Table 5 and Table 6.
2.4	Figure 9. Trekelano Topsoil Stockpile removed.
3.1	Reference to Trekelano removed.
4.2	Description of Trekelano topography removed.  Trekelano removed from Figure 10.
4.3	Description of Trekelano hydrology removed.
4.4.2.1	Dermer Creek Receiving Waters and Reference Site monitoring locations removed from Table 7.
4.4.2.3	Trekelano Environmental Dam 1 removed from Table 8.  Trekelano removed from Figure 11.
4.4.3.1	Trekelano bores removed from Table 10.  Trekelano removed from Figure 13.
4.5	Description of Trekelano hydrogeology removed.
4.6	Description of Trekelano soils removed.  Trekelano removed from Figure 15.
4.7	Description of geological units at Trekelano removed.  Trekelano removed from Figure 16.



Section	Revision
4.8.1	Regional ecosystem 1.11.3a and 1.5.4d are only relevant to Trekelano and have been removed from the report.  Trekelano removed from Figure 17.
4.8.2	Reference to Trekelano removed.
4.8.3.2, 4.8.3.3	The following Matters of National Environmental Significance are only relevant to Trekelano and were removed from the assessment: <ul style="list-style-type: none"> <li>- Mount Isa Mallee (<i>Eucalyptus nudicaulis</i>)</li> <li>- <i>Sclerolaena blakei</i></li> <li>- Gouldian finch (<i>Chloebia gouldiae</i>)</li> <li>- Gulf snapping turtle (<i>Elseya lavarackorum</i>)</li> </ul>
4.8.4.1.5, 4.8.4.1.7	The length of stream order 1 and 2 watercourses within the Project area reduced from 55.25 km to 55.06 km.  The area of Regulated Vegetation – Intersecting a Watercourse was reduced from 138.13 ha to 137.65 ha.
4.8.5	Mount Isa Mallee ( <i>Eucalyptus nudicaulis</i> ), <i>Sclerolaena blakei</i> , gouldian finch ( <i>Chloebia gouldiae</i> ), and gulf snapping turtle ( <i>Elseya lavarackorum</i> ) were removed from likelihood of occurrence assessment.  Trekelano removed from Figure 18.
5.1.2.1	Mount Isa Mallee ( <i>Eucalyptus nudicaulis</i> ) and <i>Sclerolaena blakei</i> no longer relevant. Discussion on EPBC listed flora species was removed.  Discussion removed as no listed EPBC flora species were identified following the de-amalgamation of Trekelano.
5.1.2.2	Number of fauna species identified with potential to occur within 50 km of the Project amended to reflect removal of gouldian finch ( <i>Chloebia gouldiae</i> ) and gulf snapping turtle ( <i>Elseya lavarackorum</i> ).
5.1.3	Removal of Significant Residual Impacts for the Mount Isa Mallee ( <i>Eucalyptus nudicaulis</i> ) and the <i>Sclerolaena blakei</i> .
5.1.4	Trekelano topsoil stockpile removed from Table 22.
5.1.6	Trekelano removed from Figure 20.
5.1.9	Trekelano WRD removed from Table 23.
5.2.2	Reference to Trekelano removed.
5.4.1	Reference to Trekelano removed.  Trekelano removed from Figure 23.

Section	Revision
	Closest sensitive receptor for the Project revised to Pathungra and Kheri outstation.
5.4.2	Reference to Trekelano removed.
5.5.1	Reference to Trekelano removed.  Closest sensitive receptor for the Project revised to Pathungra and Kheri outstation.

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# 1. Introduction

Wulguru Technical Services Pty Ltd (WTS) was engaged by Chinova Resources Osborne Pty Ltd (Chinova), owner and operator of the Osborne Mine (the Project), to prepare supporting information for amendments to Environmental Authority (EA) EPML00873613, dated 23 July 2025.

Preparation of a Progressive Rehabilitation and Closure Plan (PRCP) identified discrepancies between authorised and current on-ground disturbances. Additionally, feedback from the Department of Environment, Tourism, Science and Innovation (DETSI) following an Estimated Rehabilitation Cost (ERC) application, identified discrepancies between the proposed rehabilitation methods and what is authorised by the EA. This application proposes the retrospective assessment and approval of historical disturbances for activities to continue in compliance with the *Environmental Protection Act 1994* and allow consistency between different legislative frameworks.

## 1.1. Purpose

The purpose of this document is to describe the existing environmental values and assess the potential environmental impacts that may arise from the proposed amendments. A risk assessment has been completed for the identified potential impacts and reasonable and appropriate mitigation measures are proposed.

## 1.2. Project Location

The Osborne Project is located approximately 195 km south-east of Mount Isa in north-west Queensland (Figure 1). The Project includes one satellite asset known as Lucky Luke. Lucky Luke is an undeveloped copper deposit, located 30 kms north-west of the Osborne Project area.

The entire Project encompasses four (4) Mining Leases (MLs), as detailed in Table 1, with underlying landholders are identified in

Table 2.

The Project is underlain by four (4) separate pastoral holdings, including:

- Burnham (considered part of the Chatsworth Station), owned by MDH Pty Ltd;
- Chatsworth, owned by MDH Pty Ltd;
- Pathungra, owned by John and Patricia Treloar; and
- Kheri, owned by William Cameron.

**Table 1. Granted tenures for the Project and associated activities**

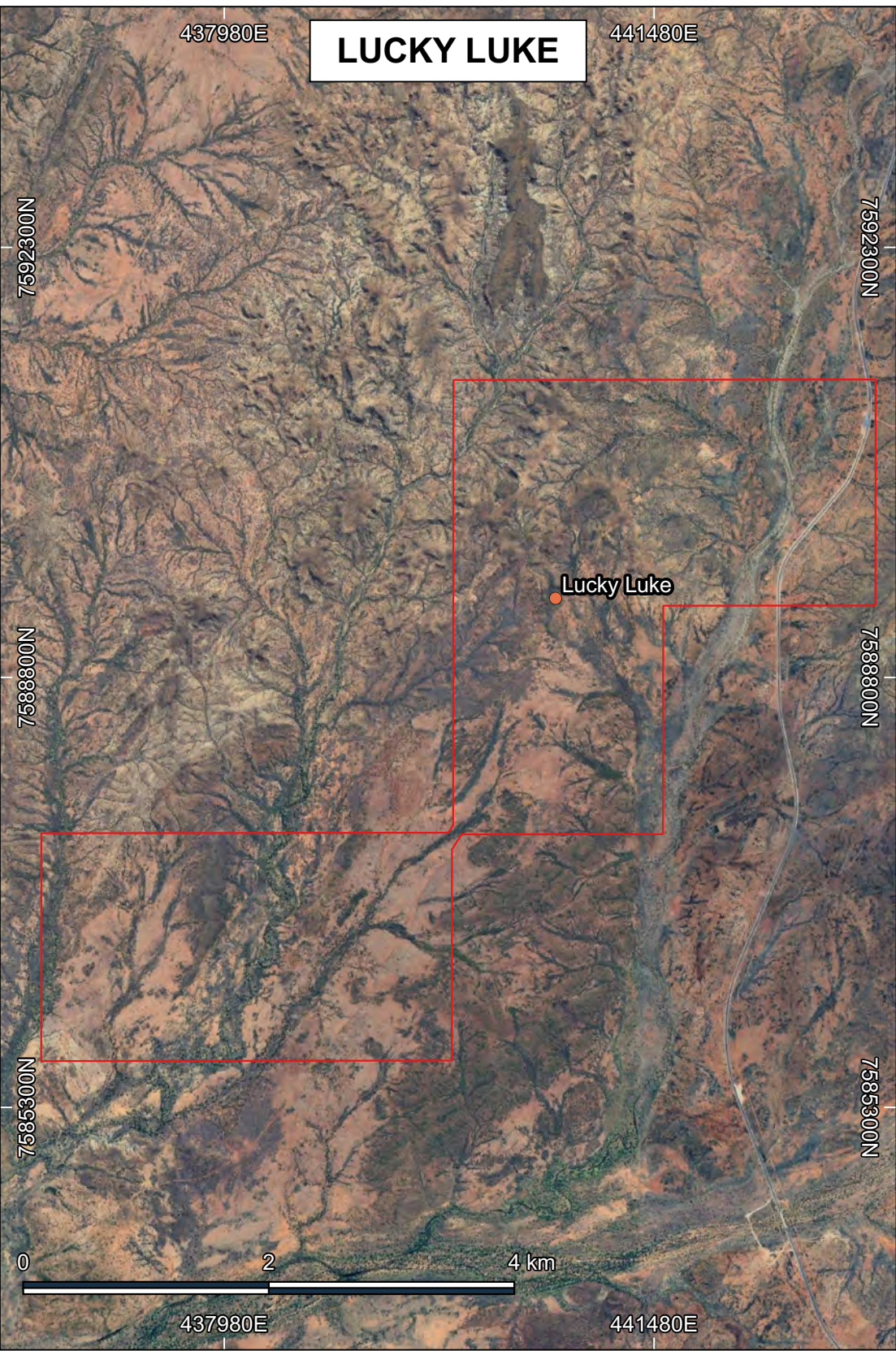
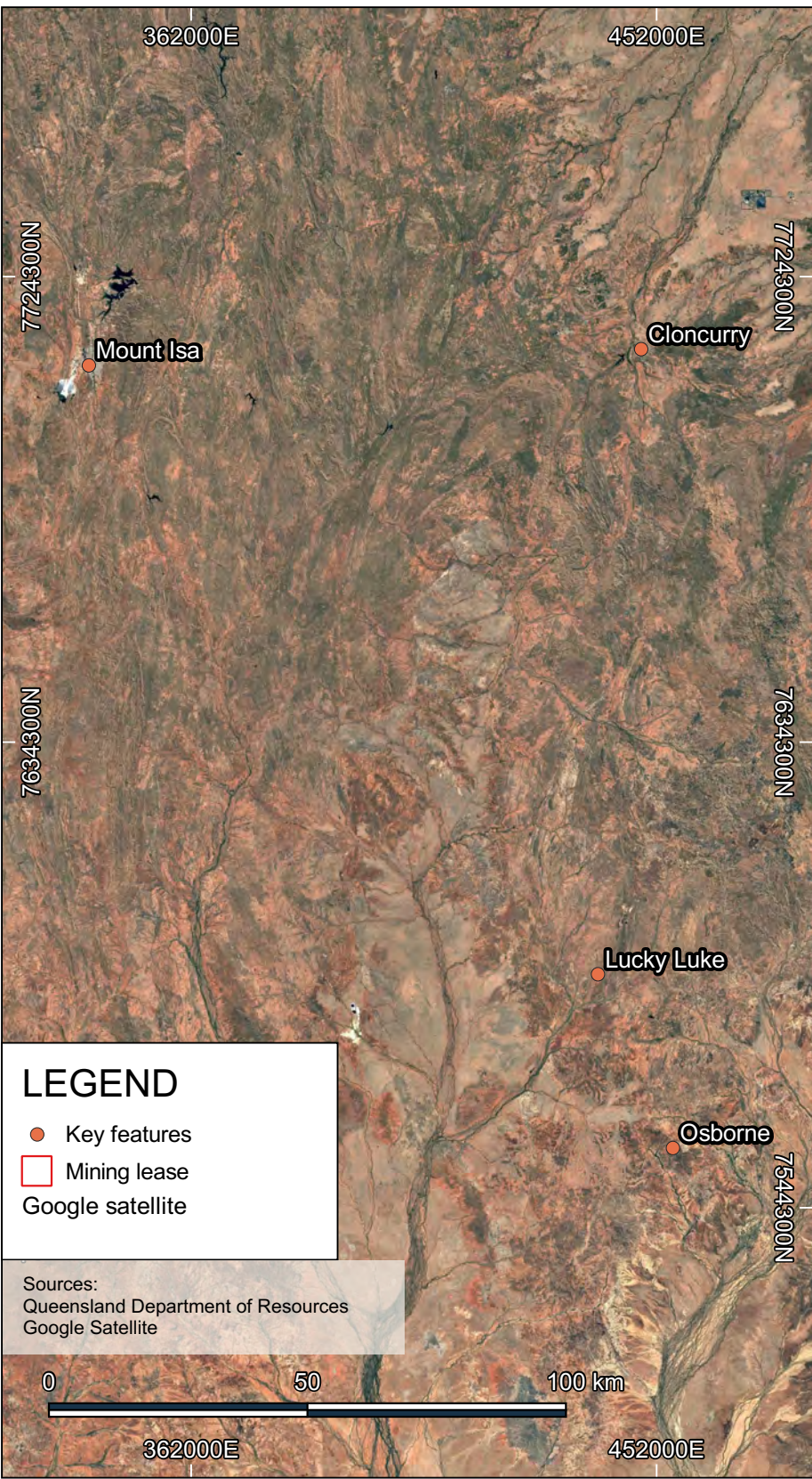
Project	Mining Lease	Mining Lease Name	Area (ha)	Activities
Lucky Luke	ML90187	Lucky Luke	1572.56	Open Cut Pit Waste Rock Emplacement Ancillary Infrastructure (workshop, administration building, landfill) ROM Topsoil Stockpiles
Osborne	ML90040	Osborne	2152	Osborne Pit Waste Rock Emplacements TSF1 TSF2 Processing Plant
	ML90158	Kulthor	1771	Ancillary Infrastructure (accommodation village, administration buildings, workshops, sewage treatment plants, haul roads, pipelines, bores, magazines, landfills, laydown areas, Kulthor surface infrastructure)
	ML90057	Borefield and Services	64.31	Material stockpiles Power station Exploration

Note: Development has not commenced at Lucky Luke. Accordingly, all activities at this project are proposed.

**Table 2. Underlying landholder**


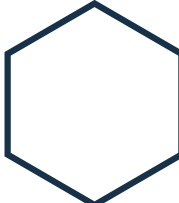
Lot	Plan	Tenure	Landholder	Mining Lease Overlap
5328	SP271692	Lands Lease	MDH Pty Ltd	ML90040 ML90158 ML90057
2	WNR12	Lands Lease	Treloar	ML90057
5354	PH1831	Lands Lease	Cameron	ML90057
13	SP309109	Lands Lease	MDH Pty Ltd	ML90187





**EA AMENDMENT**

**FIGURE 1. PROJECT LOCATION**

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			Author: H. Robb	
	Project Number: 2025.03007    Client: Chinova Resources Pty Ltd		Version: 0.02	



## **1.3. Legislative Context**

### **1.3.1. Environmental Protection Act 1994 (Qld)**

The *Environmental Protection Act 1994* (EP Act) is Queensland's primary piece of environmental legislation. The objective of the EP Act is to 'protect Queensland's environment while allowing for development that improves the total quality of life, both now and in the future, in a way that maintains the ecological processes on which life depends'.

'Environment' is defined under the Act as (section 8):

- Ecosystems and their constituent parts, including people and communities;
- All natural and physical resources;
- The qualities and characteristics of locations, places and areas, however large or small, that contribute to their biological diversity and integrity, intrinsic or attributed scientific value or interest, amenity, harmony and sense of community; and
- The social, economic, aesthetic and cultural conditions that affect, or are affected by, things mentioned in paragraphs (a) to (c).

To ensure the protection of environmental values, Chinova are required to meet the requirements of the EP Act and its subordinate legislations.

### **1.3.2. Mineral Resources Act 1989 (Qld)**

The *Mineral Resources Act 1989* (Qld) (MR Act) provides for the assessment, development and utilisation of mineral resources. The MR Act establishes a framework to facilitate mining-related activities through the leasing of prospecting, exploration, mineral development, and mining tenure.

Approval is required to mine the minerals specified in the lease and for all purposes necessary to effectually carry out mining as well as other mining activities specified in the ML and associated with, arising from, or promoting the activity of mining. Mining and production and associated activities including processing and rehabilitation must be conducted within a ML.

## **2. Overview of Proposed EA Amendment**

Applications to amend an EA must be made in accordance with s.224 and s.225 of the EP Act and meet the application requirements detailed in s.226. An application must also comply with s.226AA, s.226A, s.226B, s.227 and s.227AA to be considered 'properly made'.

## **2.1. Proposed Amendments**

### **2.1.1. Proposed Amendment 1: Revised Area of Authorised Structures**

This amendment proposes to modify the maximum disturbance area for existing features currently authorised under Schedule A, Table A1 – Authorised Disturbances of the EA (date: 23 July 2025), to accurately reflect on-ground disturbance (refer Table 3). All disturbances have been reviewed utilising the Google Satellite aerial imagery, accessed 22 April 2025.

Features have previously been identified in Table A1, however, the total authorised disturbance areas are not consistent with on-ground disturbance. The majority of overclear has been identified at Osborne and Kulthor. No overclear was identified at Lucky Luke. The amendment does not propose any additional disturbance or future on ground works to occur. All features will continue to be managed in accordance with existing Project procedures.

Unauthorised borrow pits have previously been established within the authorised disturbance footprints for the TSF2 Stockpile NE and TSF2 Stockpile E. As no topsoil stockpile has been constructed at TSF2 Stockpile NE, this feature has been removed from Table A1. A topsoil stockpile remains in place at TSF2 Stockpile E; however, the authorised disturbance area has been reduced to 0.6 ha to reflect the actual on-ground extent, with the remaining area occupied by the borrow pit. Amendment 2 (refer Section 2.1.2) proposes the inclusion of borrow pits within Table A1 of the EA. The existing, unauthorised borrow pits within the footprint for TSF2 Stockpile NE and TSF2 Stockpile E will be captured under this feature.

### **2.1.2. Proposed Amendment 2: Authorisation of Existing, Unauthorised Mine Features**

Several existing features have not previously been defined in Table A1. This amendment proposes the inclusion of the following mine features to Table A1:

- Borrow Pits (10.87 ha) (Figure 4)
- TSF2 East Environmental Dam (in approved Borrow Pits footprint (0.79 ha)) (Figure 5)
- Administration Office (0.41 ha) (Figure 6)
- Magazine (0.46 ha) (Figure 7)
- Magazine Topsoil Stockpiles (0.74 ha) (Figure 8)
- Processing Plant Topsoil Stockpiles (0.91 ha) (Figure 8)

For consistency, TSF2 East Environmental Dam has been incorporated into the water storage monitoring schedule defined in Table C – 11 (Onsite Water Storage Monitoring).

These features currently exist on ground and are actively being utilised for Project activities. The amendment does not propose any future disturbance or additional on ground works.

No new features are proposed for inclusion at Lucky Luke.

### 2.1.3. Proposed Amendment 3: Disposal of Water and Dam Liners within the Osborne Pit

The amendment proposes to modify Condition E6-3 of the EA to authorise the disposal of water and dam liners within the Osborne pit. The EA currently authorises the disposal of regulated waste into the open pit, including potentially acid forming (PAF) material, mineralized waste, construction/demolition waste, and general inert site clean-up materials.

A revised Condition E6-3 has been provided within Section 2.2 below.

## 2.2. Proposed Conditioning

A revised Table A1 – Authorised Disturbance is provided for inclusion in the EA (Table 3). Revised areas are provided to two decimal places. Where the maximum authorised area is greater than the on-ground disturbance, the maximum area has been retained. Proposed Schedule I – Maps/Plans are provided in **Appendix A: Proposed Schedule J – Maps and Plans**.

A proposed Table C11 – Onsite Water Storage Monitoring (Table 4) and revised Condition E6-3 are provided below for inclusion in the EA.

**Table 3. Proposed Table A1 – Authorised Disturbance**

Mine Domain	Mine Feature Name	Mining Lease/s located upon	Location (MGA94, zone 55)		Maximum Disturbance Area (ha)
			Northing	Easting	
Waste Rock Dump (WRD) and Ore Stockpiles	Osborne WRD	90040	7557032	456179	15.27
			7557375	456485	
			7556882	456895	
	Osborne West WRD	90040	7556454	455557	13.71
			7556308	455791	
			7555792	455443	
			7555745	455677	
	Lucky Luke WRD	90187	7589350	441158	50.00
			7589244	440783	
			7588538	440723	
			7588534	441441	
			7589096	441452	
Run of Mine (ROM)	Osborne ROM	90040	7556827	456502	19.73
	Lucky Luke ROM	90187	7589035	440664	6.65
Processing Area	Osborne Processing Plant	90040	7556706	456905	8.61
Open Cut Pit	Osborne Pit and Extension	90040	7556581	456043	27.65
			7556288	456108	
			7556488	455737	

Mine Domain	Mine Feature Name	Mining Lease/s located upon	Location (MGA94, zone 55)		Maximum Disturbance Area (ha)
			Northing	Easting	
	Lucky Luke Pit	90187	7556912	455809	10.09
			7556945	456130	
			7589639	440727	
			7589512	440546	
			7589306	440615	
Tailings Storage Facility (TSF)	TSF1	90040	7555186	456031	56.15
			7556153	456242	
			7556247	455757	
			7555308	455530	
	TSF2	90040	7556105	456703	167.56
			7555711	456725	
			7555207	456898	
			7555114	458141	
			7555928	458145	
			7556556	457893	
			7557021	457543	
			7557047	457159	
	TSF3	90040	7555801	455328	39.13
			7556079	455282	
			7555661	454796	
			7555496	454810	
			7555263	455543	
Dams and Diversions	TSF2 Reclaim Dam	90040	7555416	457792	In TSF2 footprint (27.00 ha)
	Environmental Dams 2 and 3	90040	7557364	456550	4.54
	Environmental Dam 1	90040	7556351	455301	10.26
	Environmental Dam 4	90040	7556844	456960	0.49
	Lucky Luke Sediment Dam	90187	7588243	441472	0.93
	Lucky Luke Storm Water Dam	90187	7588777	440647	1.00
	Lucky Luke De-water Dam	90187	7589574	440500	0.76
	TSF 3 Reclaim Dam	90040	7556217	455103	18.26
	TSF2 East Environmental Dam	90040	7556598	457805	In Borrow Pits footprint (0.79 ha)
Topsoil Stockpiles	TSF1 Stockpile West	90040	7555961	455494	6.78
	TSF2 Stockpile West	90040	7556042	456598	0.95
	TSF1 WRD Stockpile	90040	7556317	456004	9.57
	TSF2 Stockpile E	90040	7555997	458258	0.60



Mine Domain	Mine Feature Name	Mining Lease/s located upon	Location (MGA94, zone 55)		Maximum Disturbance Area (ha)
			Northing	Easting	
	Osborne Pit Stockpile	90040	7556823	455671	5.34
	Lucky Luke Stockpile	90187	7588408	441055	14.42
	Magazine Stockpile	90040	7555230	457339	0.74
			7555244	457070	
	Processing Plant Topsoil	90040	7556482	457071	0.91
Ancillary Infrastructure	Airport Health Clinic and STP	90040	7557614	454617	0.025
	Administration Office	90040	7556484	456551	0.41
	Old Health Clinic and STP	90040	7556081	456287	0.46
	Contractor Workshop (open cut pit extension)	90040	7556586	456544	0.033
	Osborne Landfill/Laydown	90040	7555984	456726	10.59
	Bowser/Power Station	90040	7556403	256878	2.20
	Osborne Mine Workshop	90040	7556598	457070	3.72
	Kulthor Surface Infrastructure	90040	7556544	454342	24.54
	Osborne Village	90040	7553040	455542	9.75
	Osborne Airstrip	90040 and 90158	7557623	454691	33.38
	New Osborne Core Shed	90040	7556844	454830	3.60
	Osborne Contractor Yard	90040	7556434	456206	3.30
	OSJ Shed	90040	7556858	454984	3.17
	Osborne Pit Workshop	90040	7556591	454844	3.20
	Lucky Luke Landfill	90187	7588614	440641	0.61
	Lucky Luke Office/Workshop	90187	7587759	440598	0.89
	Gas and Borefields Pipeline	90040 and 90057	NA	NA	30.13
	Borrow Pits	90040	Various		10.87
	Magazine	90040	7555207	457103	0.46
			7555244	457425	
Roads and Tracks	Osborne	90040 and 90158	NA	NA	131.41
	Lucky Luke	90187	NA	NA	16.15

**Table 4. Proposed Table C11 – Onsite Water Storage Monitoring Locations**

Monitoring Point	Coordinates (MGA94, Z54)		Monitoring Frequency
	Northing	Easting	
Environmental Dam 1	7556343	455189	Quarterly (if water is present)
Environmental Dam 3	7557282	456686	

Monitoring Point	Coordinates (MGA94, Z54)		Monitoring Frequency
	Northing	Easting	
Lucky Luke Environmental Dam 1	7588243	441472	
Luky Luke Stormwater Dam	7588777	440647	
TSF2 East Environmental Dam	7556624	457852	

### Condition E6-3

*The regulated waste licenced for disposal in the Tailings Storage areas listed in Schedule A- Table A1 (Authorised Mining Activities) and/or in the Osborne open cut pit is limited to:*

- a) Tailings from the mineral processing operation originating from activities located on ML90187, ML90040, ML90057, ML90183, ML90125, ML90068, ML90128, ML90158 and ML2733;*
- b) Potential acid forming material of up to 0.61 Million m3 from TSF2;*
- c) (EML Project) Tailings of up to 4.25 Million m3;*
- d) TSF2 material of up to 0.42 Million m3 stockpiled on the ROM;*
- e) Potential acid forming material of up to 0.88 Million m3 stored on the TSF1 oxide cell;*
- f) Mineralized waste and screen fines of up to 0.185 Million m3;*
- g) General inert site clean-up materials of up to 0.05 Million m3;*
- h) Mine affected waters of from the Process Water Pond, Environment Dam 2/3, Environment Dam 4, Kulthor Turkey's Nest, TSF2 Reclaim Dam, and Workshop Ponds;*
- i) Dam liners from the Process Water Pond and Kulthor Turkey's Nest.*

## 2.3. Justification of Proposed Amendment

All persons under Section 319 of the EP Act must fulfill their general environmental duty to not carry out any activity that causes, or is likely to cause, environmental harm unless the person has an authority to do so or has taken all reasonably practicable measures to prevent or minimise the harm. This amendment is required to ensure that Project activities are lawful and appropriately managed. Additionally, this will ensure consistency is achieved between various legislative frameworks (i.e. PRCP and ERC).

To reiterate, no future disturbance is planned to occur under this proposed amendment.

### 2.3.1. Justification Proposed Amendment 1

This amendment seeks the authorisation of existing disturbance, above what is currently authorised. A review of historical aerial imagery identified that this disturbance occurred across the MLs incrementally, since the 1990's. Generally, this overclear has resulted in < 1ha of additional disturbance per feature.

The resolution of the existing authorising figures in the EA is poor, and it is difficult to determine the exact boundaries of authorised disturbance areas compared to unauthorised disturbance.

Osborne roads and tracks account for the majority of additional disturbance (131.41 ha). This disturbance occurred incrementally across the entire Project MLs. The information available does not provide a justification for this disturbance, other than a lack of high-quality spatial data at the time. Advancements in imagery and accessibility have significantly improved Chinova's ability to monitor disturbance across its large Project area.

A comparison of the authorised disturbance and on ground disturbance is provided in Table 5.

**Table 5. Current and Proposed Authorised disturbance**

Mine Domain	Mine Feature Name	Current Maximum Authorised Disturbance (ha)	Proposed Authorised Disturbance (ha)	Area Increase (ha)
Waste Rock Dump (WRD) and Ore Stockpiles	Osborne WRD	15.27	15.27	0
	Osborne West WRD	13.71	13.71	0
	Lucky Luke WRD	50.00	50	0
Run of Mine (ROM)	Osborne ROM	16.44	19.73	3.29
	Lucky Luke ROM	6.65	6.65	0
Processing Area	Osborne Processing Plant	6.23	8.61	2.38
	Osborne Pit and Extension	26.01	27.65	1.64
	Lucky Luke Pit	10.09	10.09	0
Tailings Storage Facility (TSF)	TSF1	56.15	56.15	0
	TSF2	159.50	167.54	8.04
	TSF3	39.13	39.13	0
Dams and Diversions	TSF2 Reclaim Dam	In TSF2 footprint (21.65 ha)	In TSF2 footprint (27.00 ha)	5.35
	Environmental Dams 2 and 3	4.54	4.54	0
	Environmental Dam 1	10.26	10.26	0
	Environmental Dam 4	0.486	0.49	0.004
	Lucky Luke Sediment Dam	0.93	0.93	0
	Lucky Luke Storm Water Dam	1.00	1	0
	Lucky Luke De-water Dam	0.76	0.76	0
	TSF 3 Reclaim Dam	18.26	18.26	0
	TSF2 East Environmental Dam	-	Within Borrow Pits footprint (0.79 ha)	0.79
Topsoil Stockpiles	TSF1 Stockpile West	6.78	6.78	0
	TSF2 Stockpile West	0.91	0.95	0.04
	TSF1 WRD Stockpile	9.57	9.57	0

Mine Domain	Mine Feature Name	Current Maximum Authorised Disturbance (ha)	Proposed Authorised Disturbance (ha)	Area Increase (ha)
	TSF2 Stockpile E	6.12	0.6	-5.52
	TSF2 Stockpile NE	3.39	0	-3.39
	Osborne Pit Stockpile	5.34	5.34	0
	Lucky Luke Stockpile	14.42	14.42	0
	Magazine Topsoil Stockpile	-	0.74	0.74
	Processing Plant Topsoil Stockpile	-	0.91	0.91
Ancillary Infrastructure	Airport Health Clinic and STP	0.025	0.025	0
	Administration Office	-	0.41	0.41
	Old Health Clinic and STP	0.025	0.046	0.021
	Contractor Workshop (open cut pit extension)	0.033	0.033	0
	Osborne Landfill/Laydown	8.72	10.59	1.87
	Bowser/Power Station	2.20	2.2	0
	Osborne Mine Workshop	3.10	3.72	0.62
	Kulthor Surface Infrastructure	24.54	24.54	0
	Osborne Village	9.75	9.75	0
	Osborne Airstrip	33.38	33.38	0
	New Osborne Core Shed	3.60	3.6	0
	Osborne Contractor Yard	2.84	3.3	0.46
	OSJ Shed	3.17	3.17	0
	Osborne Pit Workshop	3.20	3.2	0
	Lucky Luke Landfill	0.61	0.61	0
	Lucky Luke Office/Workshop	0.89	0.89	0
	Gas and Borefields Pipeline	30.13	30.13	0
	Borrow Pits	-	10.87	10.87
	Magazine	-	0.46	0.46
Roads and Tracks	Osborne	16.20	131.41	115.21
	Lucky Luke	16.15	16.15	0

Note: Borrow pits were established within the disturbance footprints for TSF2 Stockpile E and TSF2 Stockpile NE. The authorised maximum disturbance for TSF2 Stockpile E has been reduced to reflect on-ground disturbance. TSF2 Stockpile NE has been removed from Table A1 as it has not been constructed and the feature is not required.

### 2.3.2. Justification Proposed Amendment 2

The proposed amendment relates to new features, not previously defined in the EA. WTS undertook a review of historical imagery to identify when the additional features were constructed. Table 6 defines the first date that the features can be observed from aerial imagery. Further detail on the construction and purpose of each feature is described below.

**Table 6. Date of historic disturbance**

Feature	Date disturbance first identified on aerial imagery
Processing Plant Topsoil Stockpile	4/05/2004
Borrow pits to the north of TSF 2	17/08/2010
TSF2 East Environmental Dam	17/08/2010
Magazine	6/06/2013
Magazine Topsoil Stockpile	6/06/2013
Borrow Pit for TSF2 Dam (East)	11/03/2019

The specific date for the establishment of the administration offices is not available, however, the construction of the supporting and ancillary infrastructure at Osborne commenced in 1994. The magazine was established to the south of TSF2 in 2013. The administration office and magazine have not previously been authorised under the EA.

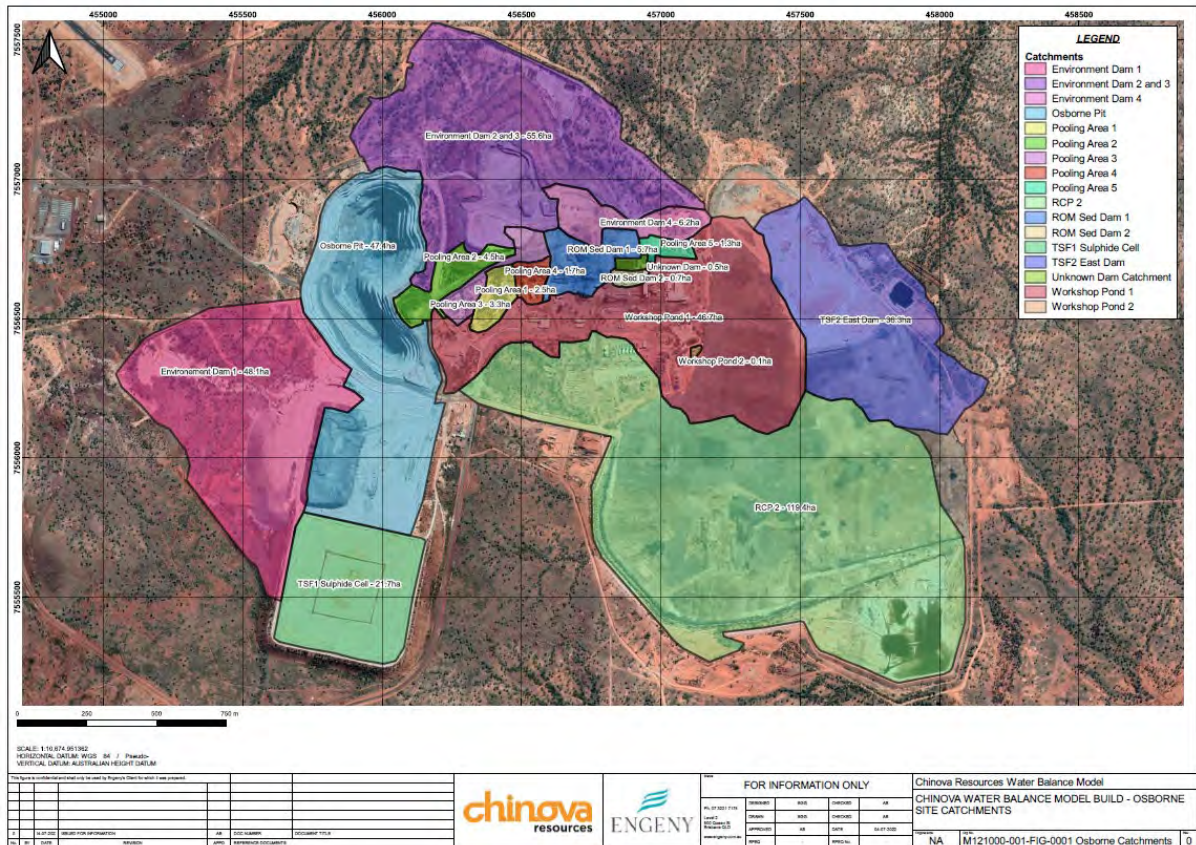
Topsoil stockpiles have previously been authorised under the EA; however, the magazine and processing plant stockpiles have not been included.

Borrow pits were utilised to facilitate the construction of TSF2's capping system in 2016; however, were not previously authorised under the EA.

The TSF2 East Environmental Dam is located within the authorised disturbance footprint for the TSF 2 Stockpile NE and captures runoff from a 36.26 ha catchment located within the north-eastern extent of the now capped TSF2. The TSF2 East Environmental Dam has a maximum capacity of 61.6 ML and prevents runoff from the now capped TSF2 releasing into the receiving environments of No Name Creek and Little Sandy Creek to the north (Chinova, 2025). SLR prepared a design for the TSF2 East Environmental Dam in 2015, which has been attached within Appendix D.

The catchment which TSF2 East Environmental Dam services is illustrated within Figure 2.



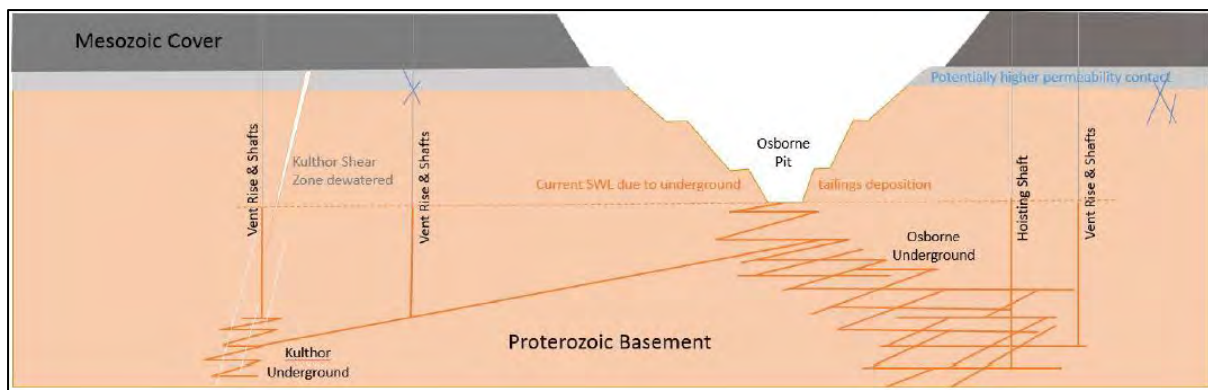


**Figure 2. Osborne Mine Catchment Areas (Chinova, 2025)**

### 2.3.3. Justification Proposed Amendment 3

This amendment seeks to authorise the disposal of water and dam liners within the Osborne pit. The pit is currently authorised for the storage of multiple waste streams, including tailings, mineralised waste, and demolition waste during operations and rehabilitation. Tailings have additionally been deposited within the Osborne underground workings surrounding and beneath the pit.

Technical studies have concluded that potential impacts to groundwater from the storage of waste within the pit are unlikely as the pit walls are impermeable and groundwater within the adjacent geology is limited and highly compartmentalised (SLR, 2022a). It is not expected that there will be any additional impacts resulting from the disposal of water and dam liners to the open pit, provided the infill and water levels do not intersect the Mesozoic-Proterozoic contact between relative level (RL) 1245 m and RL 1250 m (SLR, 2021b). The Mesozoic-Proterozoic contact between RL 1245 m and 1250 m is the hydrostratigraphic unit with the highest potential permeability (AGE, 2023a). The hydrogeology of the Osborne pit has been illustrated within Figure 3.



**Figure 3. Osborne Pit and Underground Workings Hydrology (SLR, 2021b)**

### ***Disposal of Water within the Osborne Pit***

Following cessation of operations, the Process Water Pond, Environment Dams 2/3 and 4, Kulthor Turkey's Nest, TSF2 Reclaim Dam, and Workshop Ponds will be rehabilitated. To reduce the timeframe and cost associated with evaporation prior to rehabilitation, Chinova proposes to dispose of any residual water within the Osborne Pit. Chinova developed a GoldSim probabilistic water balance model for Osborne to estimate the volume of water requiring disposal on cessation of operations. The total maximum volume of residual water requiring disposal within the pit is 84.6 ML.

Void hydrology modelling by AGE indicates that, after backfilling, the pit has a remaining capacity of 282,000 m<sup>3</sup> (282 ML) before reaching RL 1245 m (AGE, 2023a), the intersection of the Mesozoic-Proterozoic formation. The water level within the pit is not to exceed RL 1,245 m to minimise interaction with groundwater associated with the Mesozoic-Proterozoic contact (SLR, 2022b). Disposal of 84.6 ML of water will not cause the pit water level to intersect the Mesozoic-Proterozoic contact at this elevation.

AGE further concluded that, under all but the most extreme rainfall events (1% AEP), the pit will maintain a negative water balance. Under the 1% AEP climate conditions, the pit water budget is positive 51,210 m<sup>3</sup> per year, indicating a shallow ephemeral lake will form. Theoretically this pit can be considered a sink; however, there is no groundwater connectivity and no actual water table adjacent the pit. The remaining capacity below RL 1245 m following a year of 1% AEP climate conditions will be 230,790 m<sup>3</sup> (AGE, 2023a).

Under the median (50<sup>th</sup> percentile) climate conditions, the pit water budget is negative 197,000 m<sup>3</sup> per year, indicating no long-term pit lake formation (AGE, 2023a). At this rate, the 84.6 ML of water disposed of within the pit is expected to evaporate within approximately 5.2 months.

Water quality for the Environment Dams 2/3 and 4, Kulthor Turkey's Nest, and TSF2 Reclaim Dam have been detailed within Section 5.2.4. Water quality has not been analysed for the Process Water Pond and Workshop Ponds. The deposited PAF material and mineralized waste already deposited within the pit means it is unlikely that the disposal of water from the water storages would reduce water quality within the pit.

### ***Disposal of Dam Liners within the Osborne Pit***

The Process Pond (0.3 ha) and Kulthor Turkey's Nest (0.1 ha) are currently lined with a high-density polyethylene (HDPE) liner to minimise seepage to groundwater. On closure, the structures will be rehabilitated to achieve a post mining land use of low-intensity agriculture. This requires removal and appropriate disposal of the liner.

Dam liners are not currently authorised for disposal within the pit; however, this method represents the most efficient option for managing this waste during site rehabilitation. A total volume of approximately 4.8 m<sup>3</sup> of dam liners is proposed for disposal within the pit.

This amendment will allow for the storage and disposal of potentially contaminated waters and dam liners in a safe and non-polluting manner, within a structure already authorised for the storage of potentially contaminated material.



## 2.4. Alternatives to the Amendments

### ***Authorisation of Overclear and Existing Unauthorised Features***

The only lawful alternative to the proposed amendment is to rehabilitate any additional disturbance above what is authorised within Table A1. As the discrepancies are generally < 1 ha per feature and spread across the entire Project, this is not practical. Rehabilitation of such small areas would be costly and difficult to execute whilst also providing no beneficial environmental outcome.

Rehabilitation of the borrow pits and topsoil stockpiles will prevent Chinova from accessing the remaining borrow material available within these sources for closure rehabilitation works (i.e., establishment of landforms). This would require additional impacts to land through the establishment of alternative borrow pits.

Removal of the administration offices will significantly hinder Chinova's ability to conduct onsite operations. Similarly, the removal of the magazine would eliminate the ability to lawfully store explosives onsite. To maintain operational capability, the removal of these facilities would necessitate the construction and approval of alternative infrastructure elsewhere onsite.

The removal of TSF2 East Environmental Dam would hinder Chinova's ability to manage potentially contaminated runoff from TSF2. Without TSF2 East Environmental Dam, potentially contaminated runoff would continue into No Name Creek and Little Sandy Creek to the north-west of TSF2.

The most appropriate way for Chinova to meet its general environmental duty is to include the overclear for authorised features and existing unauthorised features within the Table A1 of the EA, alongside the continued implementation of existing controls.

### ***Disposal of Water within the Osborne Pit***

The alternative to disposal of residual water from the Process Water Pond, Environment Dam 2/3, Environment Dam 4, TSF2 Reclaim Dam, Kulthor Turkey's Nest, and Workshop Ponds within the Osborne pit is to evaporate the water within the structures themselves. Evaporation of water from these storages is estimated to take 11 months following the cessation of operations. The estimated evaporation time for these structures does not account for additional rainfall during the wet season. Assuming the dewatering process continues into the wet season, the dewatering process will be extended, further delaying the commencement of rehabilitation works. Additionally, the in-storage evaporation will increase the costs associated with the rehabilitation of these structures.

The authorised disposal of water from onsite water storages to the pit at the cessation of operations is the most cost-effective and efficient method for remnant water disposal.

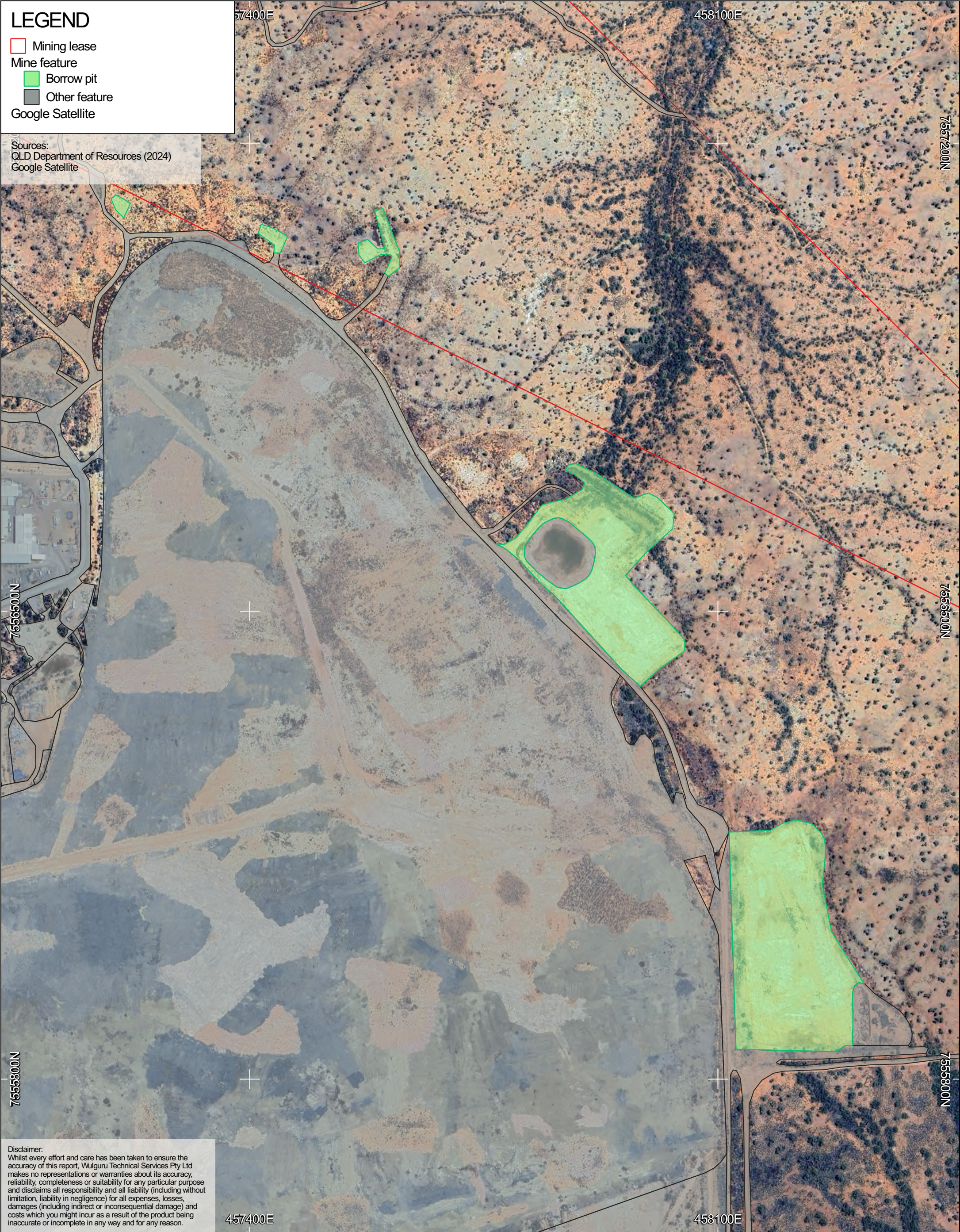
### ***Disposal of Dam Liners within the Osborne Pit***

The alternative to disposing of dam liners within the Osborne Pit is offsite disposal. The closest disposal facility is located in Mount Isa (195 km to the north-west); however, this option would incur additional

costs, including transportation and disposal fees. Transporting the liners to Mount Isa would also result in the generation of additional Scope 3 greenhouse gas emissions.

In contrast, disposal of the dam liners within the Osborne pit is the most cost-effective and operationally efficient solution.











EA AMENDMENT

FIGURE 5. TSF2 EAST ENVIRONMENTAL DAM




 <div><div>800160 m</div><div>CRS: GDA2020 / MGA zone 54 Scale: 1:2,900 @A3</div></div>	Date: 13 June 2025		 <div>WULGURU TECHNICAL SERVICES</div>
	Author: H. Robb		
	Version: 0.02		
Project Number: 2025.03007	Client: Chinova Resources Osborne Pty Ltd		





EA AMENDMENT

FIGURE 6. ADMINISTRATION BUILDING

FIGURE 6. ADMINISTRATION BUILDING			
 <div><div>800160 m</div></div> <div>CRS: GDA2020 / MGA zone 54 Scale: 1:2,900 @A3</div>	Date: 13 June 2025		 <div>WULGURU TECHNICAL SERVICES</div>
	Author: H. Robb		
Project Number: 2025.03007	Client: Chinova Resources Osborne Pty Ltd	Version: 0.02	











### **3. Project Description**

#### **3.1. Project Background**

The Osborne and Lucky Luke projects have been independently developed. The Osborne ore deposit was discovered by Placer Exploration Limited in 1988, with mining commencing in 1994. Exploration was undertaken by Placer Dome and Barrick Gold Corp at Lucky Luke between 2005 and 2008, with mining yet to commence. Chinova Resources Osborne Pty Ltd acquired Osborne and Lucky Luke from Inova Resources (Osborne) Pty Ltd in 2014 and have continued to hold the Project since that time.

Since the commencement of mining activities at Osborne, the Project has operated as both opencut and underground mines, producing copper and gold. The EA authorises ERA 31 2(a) which allows for the processing of mineral products of between 1,000 and 100,000 tonnes per annum. Process tailings are deposited within the Osborne underground. Exploration drilling is currently occurring within the mining leases.

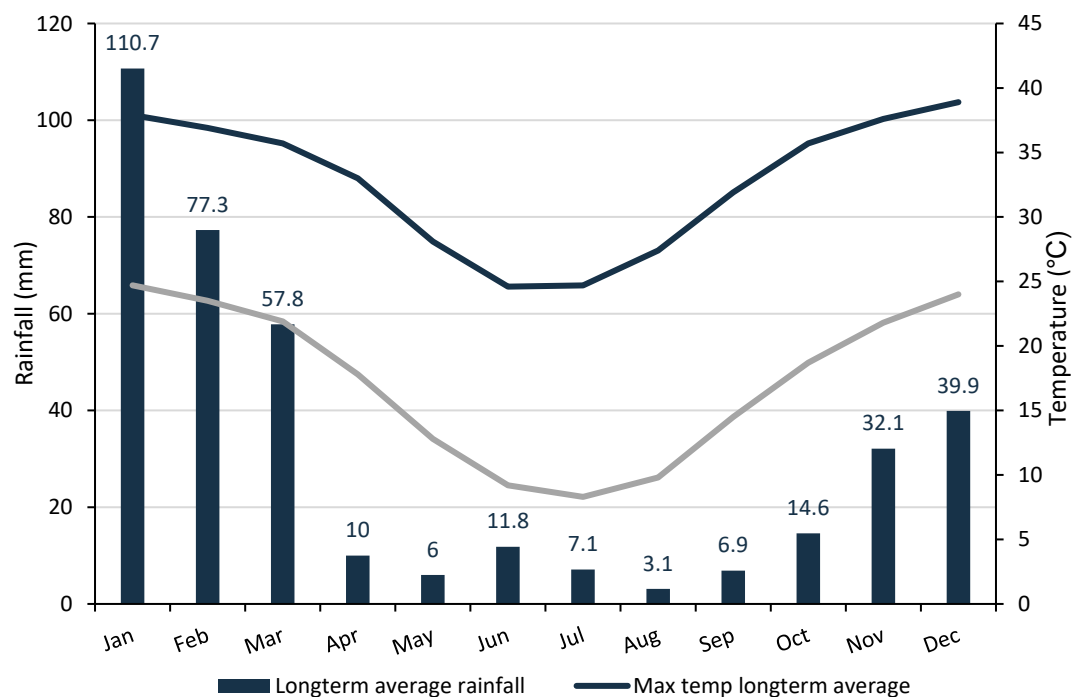


## 4. Existing Environment

### 4.1. Climate

The Project is located to the south-east of Mount Isa and south of Cloncurry and experiences hotter and wetter periods during the summer months (wet season) and drier, cooler periods during the winter months (dry season). Climate data was obtained from the Trepell Airport weather station (Queensland Government, 2024; Station no. 037036). This data has been summarised within Figure 9.

The highest average maximum temperature is recorded in December (38.9 °C), and an average minimum temperature is recorded in June (8.3°C) (Queensland Government, 2024). Highest average rainfall is seen in January, with a mean average rainfall of 114.2 mm (Queensland Government, 2024).



**Note:** Mean rainfall is the long-term average, calculated from data range 2001-2024. Maximum temperature is the average daily maximum temperature, for each month, data range 2001-2025. Mean minimum temperature is the long-term average daily minimum air temperature observed during a calendar month and over the year, data range 2001-2025.

**Figure 9. Temperature and Rainfall at Trepell Airport (Station ID 037036) (Queensland Government, 2024)**

## 4.2. Topography

### ***Osborne and Kulthor***

The Osborne and Kulthor tenements are located on a plateau between Carbo Creek (south-west) and Little Sandy Creek (north-east). The area is gently undulating (slopes < 2 %) and is dissected by small, ephemeral drainage channels which periodically flow during periods of high rainfall. Elevations across the site are generally between 260 m and 290 m AHD.

### ***Lucky Luke***

The topography of Lucky is described as undulating plains with low rises intersected by ephemeral streams, flowing from dissected low residuals and rolling hills in and beyond the northern extent of the mining lease.

The topography throughout the Project area has been illustrated within Figure 10.

### 4.3. Hydrology

Regionally, the Project is situated within the Georgina Basin which forms part of the Lake Eyre region. Surface flows within the area are highly ephemeral and typically characterised by short, flashy episodic flows associated with the wet season (January to February). Surface water flows are typically associated with surface runoff with no component of baseflow (groundwater discharge to the surface) due to the depth of the water table (AGE, 2023a). The main recharge mechanism for groundwater throughout the Project is via deep drainage of rainfall, the majority of which occurs as rainfall recharge, with a smaller volume occurring as infiltration from ephemeral streams.

Watercourses throughout the Project primarily consist of stream order 1 or 2, with few watercourses classified as stream order 3 (i.e., Carbo Creek). Watercourses within the Project have been illustrated within Figure 10.

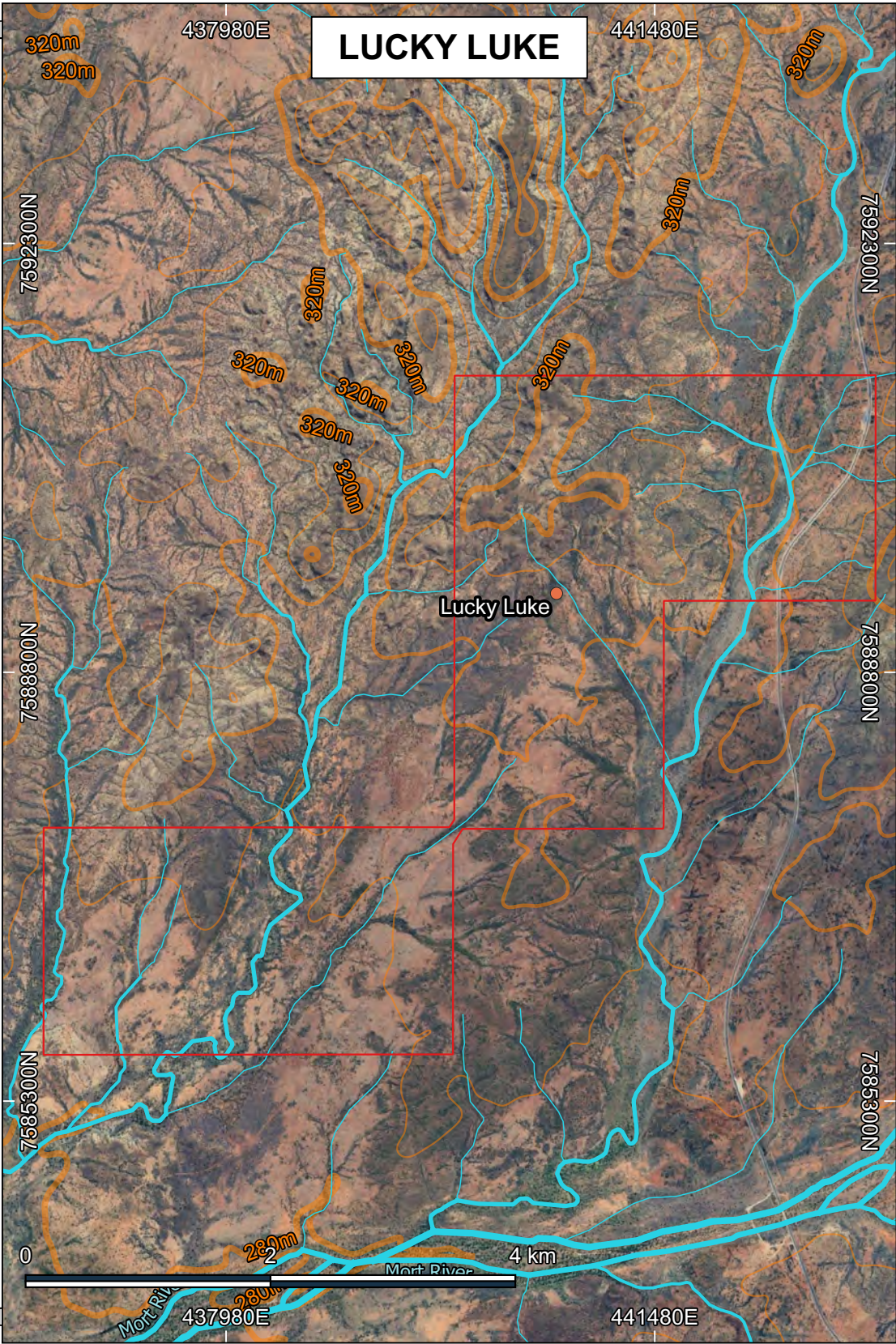
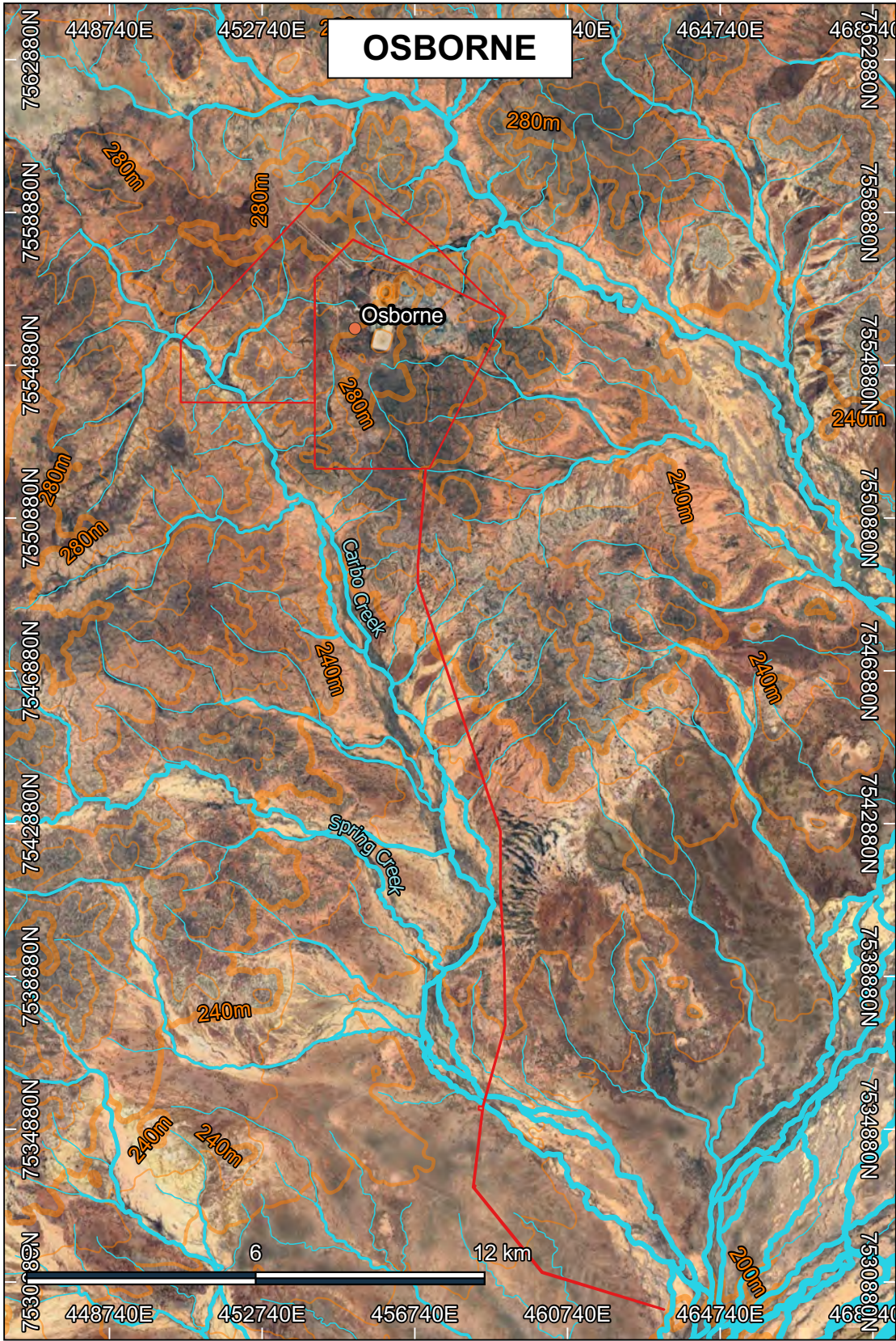
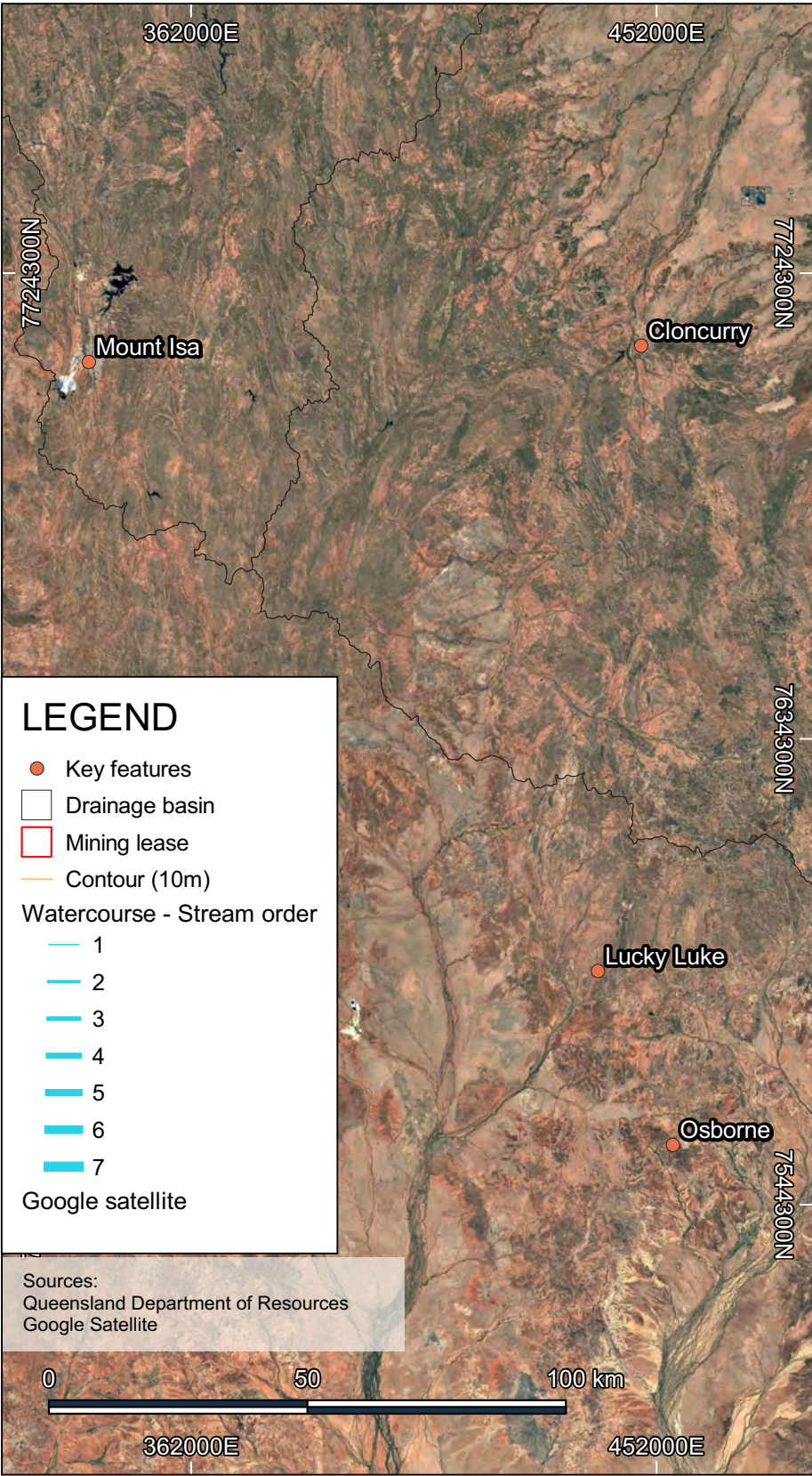
#### ***Osborne and Kulthor***

The Osborne and Kulthor tenements are located in the headwaters of Little Sandy Creek and Carbo Creek which flow 20 km south before converging with the Hamilton River. The closest homesteads to the Osborne mine are the Pathungra and Kheri outstation, located approximately 5 km from the borefield lease, approximately 26 km south of the main mining and processing area of Osborne and Kulthor. The Project experiences limited rainfall infiltration due to the underlying geology.

#### ***Lucky Luke***



Lucky Luke is dissected by ephemeral tributaries and drainage lines associated with the upper reaches of the Mort River catchment. Mort River starts approximately 20 km to the north-east of Lucky Luke and flows in a south, south-westerly direction, to within 5 km of Lucky Luke. Due to the skeletal nature of the soils and impermeable nature of the lithologies underlying Lucky Luke, rainfall accounts for the greatest proportion of runoff in the area. There are no sensitive receptors within the vicinity of Lucky Luke.





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FIGURE 10. TOPOGRAPHY AND DRAINAGE

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			Author: H. Robb	
	Project Number: 2025.03007	Client: Chinova Resources Pty Ltd	Version: 0.01	



## 4.4. Waters

### 4.4.1. Environmental Values

The *Environmental Protection (Water and Wetland Biodiversity) Policy 2019* (EPP Water and Wetland Biodiversity) is the guiding document for the determination of environmental values (EVs) and water quality objectives (WQOs) for all waters (including groundwater) in Queensland. The EPP Water and Wetland Biodiversity is progressively specifying EVs and WQOs to basins across the State, however the Georgina Rivers Basin and Lake Eyre region is yet to be included.

For those waters not included in Schedule 1 of the EPP Water and Wetland Biodiversity, all EVs listed in Section 6 (2) of the EPP Water and Wetland Biodiversity may apply, including:

- a) For high ecological value waters – the biological integrity of an aquatic ecosystem that is effectively unmodified or highly valued;
- b) for slightly disturbed waters—the biological integrity of an aquatic ecosystem that has effectively unmodified biological indicators, but slightly modified physical, chemical or other indicators;
- c) for moderately disturbed waters—the biological integrity of an aquatic ecosystem that is adversely affected by human activity to a relatively small but measurable degree;
- d) for highly disturbed waters—the biological integrity of an aquatic ecosystem that is measurably degraded and of lower ecological value than waters mentioned in paragraphs (a) to (c);
- e) for waters that may be used for producing aquatic foods for human consumption—the suitability of the water for producing the foods for human consumption;
- f) for waters that may be used for aquaculture—the suitability of the water for aquacultural use;
- g) for waters that may be used for agricultural purposes—the suitability of the water for agricultural purposes;
- h) for waters that may be used for recreation or aesthetic purposes, the suitability of the water for—
  - i. primary recreational use; or
  - ii. secondary recreational use; or
  - iii. visual recreational use;
- i) for waters that may be used for drinking water—the suitability of the water for supply as drinking water;
- j) for waters that may be used for industrial purposes—the suitability of the water for industrial use;
- k) the cultural and spiritual values of the water.

The EVs considered the most relevant to the Project include:

- b) for slightly disturbed waters—the biological integrity of an aquatic ecosystem that has effectively unmodified biological indicators, but slightly modified physical, chemical or other indicators;

- g) for waters that may be used for agricultural purposes—the suitability of the water for agricultural purposes;
- h) for waters that may be used for recreation or aesthetic purposes, the suitability of the water for—
  - iv. primary recreational use; or
  - v. secondary recreational use; or
  - vi. visual recreational use;
- j) for waters that may be used for industrial purposes—the suitability of the water for industrial use;
- k) the cultural and spiritual values of the water.

## 4.4.2. Surface Water

### 4.4.2.1. Water Quality

The EA provides receiving water reference sites and downstream monitoring locations (Table C4) as reproduced in Table 7 and displayed in Figure 11. Each site is monitored and sampled in accordance with the EA. The proposed water storages are located within existing operational areas covered by the existing monitoring program.

**Table 7. Receiving Waters Monitoring Locations and Frequency (Table C4 of the EA)**

Monitoring Point	Description	Co-ordinates (MGA94, Z54)		Monitoring Frequency
		Northing	Easting	
Receiving Waters				
Carbo Creek	Carbo Ck downstream of Osborne Mine	7551448	453756	<ul style="list-style-type: none"><li>- Event based sampling: One sample must be taken within 2 hours of a release or flow event commencing.</li><li>- Where a release or flow event has a duration of 24 hours or greater, samples must be taken daily for one week, and once a week thereafter until the release or flow event ceases<sup>2</sup>.</li><li>- Sediment monitoring only in accordance with C6-1</li></ul>
Little Sandy Creek	Little Sandy Ck downstream of Osborne Mine	7556590	462763	
Lucky Luke	Lucky Luke downstream of mine	7587215	441403	
No-name Creek	Noname Ck downstream of Osborne mine	7557804	458002	
Reference Sites <sup>1</sup>				
Carbo Creek Reference	Carbo Creek upstream of Osborne mine	7558797	448015	<ul style="list-style-type: none"><li>- Event based sampling: One sample must be taken within 2 hours of a</li></ul>

Monitoring Point	Description	Co-ordinates (MGA94, Z54)		Monitoring Frequency
		Northing	Easting	
Little Sandy Creek Reference	Little Sandy Ck upstream of Osborne Mine	7561729	455289	release or flow event commencing.  - Where a release or flow event has a duration of 24 hours or greater, samples must be taken daily for one week, and once a week thereafter until the release or flow event ceases <sup>2</sup> .
Lucky Luke Reference	Lucky Luke upstream of mine	7591076	443023	
Monitoring Sites				
No-name Creek	Noname Ck downstream of Osborne mine	7557804	458002	Monitoring for interpretive purposes only

1. Reference sites must:
  - (a) be from the same bio-geographic and climatic region; and
  - (b) have similar geology, soil types and topography; and
  - (c) contain a range of habitats similar to those at the test sites; and
  - (d) have a similar flow regime; and
  - (e) not be so close to the test sites that any disturbance at the test site also results in a change at the reference site
2. Continued sampling of release events with a duration of twenty-four (24) hours or greater is only required if there is an exceedence of a contaminant trigger level detected at the contaminant release point.

#### 4.4.2.2. Receiving Environment Monitoring Program

Chinova have developed and implemented a Receiving Environment Monitoring Program (REMP) in accordance with EA conditions C5-1 to C5-3. The REMP has been designed to monitor and characterise the receiving environment by sampling and assessing water quality, sediment quality, and biological indicators in comparison to reference locations.

Due to the ephemeral nature of the watercourses in the region, water and macroinvertebrate sampling is often limited.

#### 4.4.2.3. Water Storage Monitoring

The EA provides water storage monitoring locations (Schedule C – Table C11) as reproduced in Table 8 and displayed in Figure 12. Each site is monitored and sampled in accordance with the EA. This amendment proposes the addition of the TSF2 East Environmental Dam to the water storage monitoring schedule.

**Table 8. Water storage monitoring (Table C11)**

Monitoring Point	Coordinates (MGA94, Z54)		Monitoring Frequency
	Northing	Easting	
Environmental Dam 1	7556343	455189	Quarterly (if water is present)
Environmental Dam 3	7557282	456686	
Lucky Luke Environmental Dam 1	7588243	441472	
Lucky Luke Stormwater Dam	7588777	440647	
TSF2 East Environmental Dam – Proposed	7556624	457852	

The EA provides the onsite water storage contaminant limits (Schedule C – Table C12) as reproduced in Table 9. These water quality limits are appropriate for water quality within TSF2 East Environmental Dam.

**Table 9. Onsite water storage contaminant limits (Table C12)**

Parameter	Unit	Test Value	Contaminant
pH	pH Unit	Range	Greater than 5.0, less than 9.0 <sup>3</sup>
EC	µS/cm	Maximum	1500 <sup>4</sup>
Turbidity	NTU	Maximum	Twice the reference value
Sulphate	mg/L	Maximum	1000 <sup>1</sup>
Aluminium	mg/L	Maximum	5 <sup>1</sup>
Arsenic	mg/L	Maximum	0.5 <sup>1</sup>
Cadmium	mg/L	Maximum	0.01 <sup>1</sup>
Cobalt	mg/L	Maximum	1 <sup>1</sup>
Copper	mg/L	Maximum	1 <sup>1</sup>
Lead <sup>5</sup>	mg/L	Maximum	0.1 <sup>1</sup>
Molybdenum <sup>5</sup>	mg/L	Maximum	0.15 <sup>1</sup>
Nickel	mg/L	Maximum	1 <sup>1</sup>
Rhenium <sup>5</sup>	mg/L	Maximum	Twice the reference value
Selenium	mg/L	Maximum	0.02 <sup>1</sup>
Zinc <sup>5</sup>	mg/L	Maximum	20 <sup>1</sup>

1. Levels based on ANZECC (2000) stock water quality guidelines.

2. Levels based on reference data are to be based on 24 consecutive samples (18 at a minimum)

3. Page 4.2-15 of ANZECC (2000) "Soil and animal health will not generally be affected by water with pH in the range of 4-9".

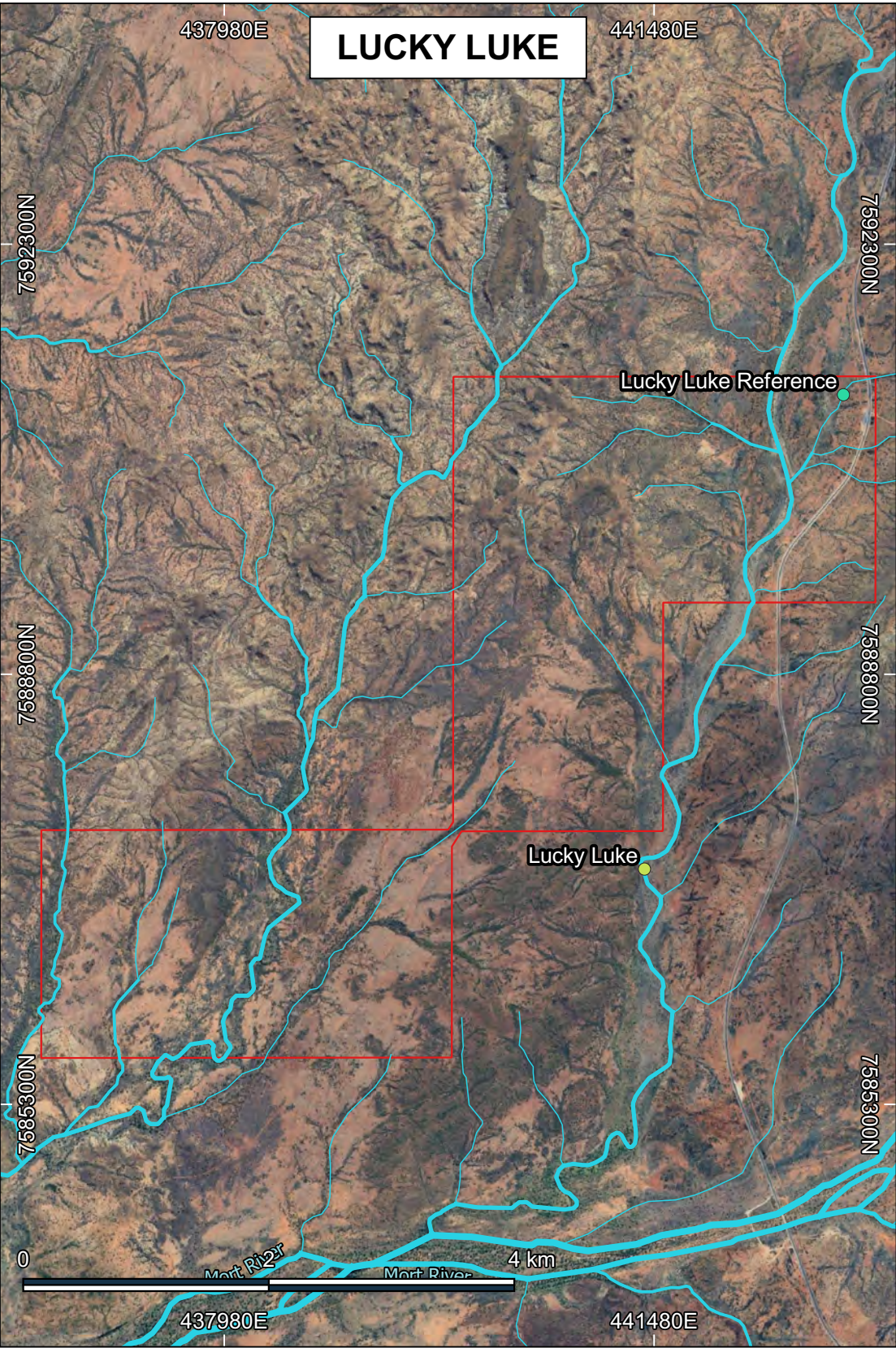
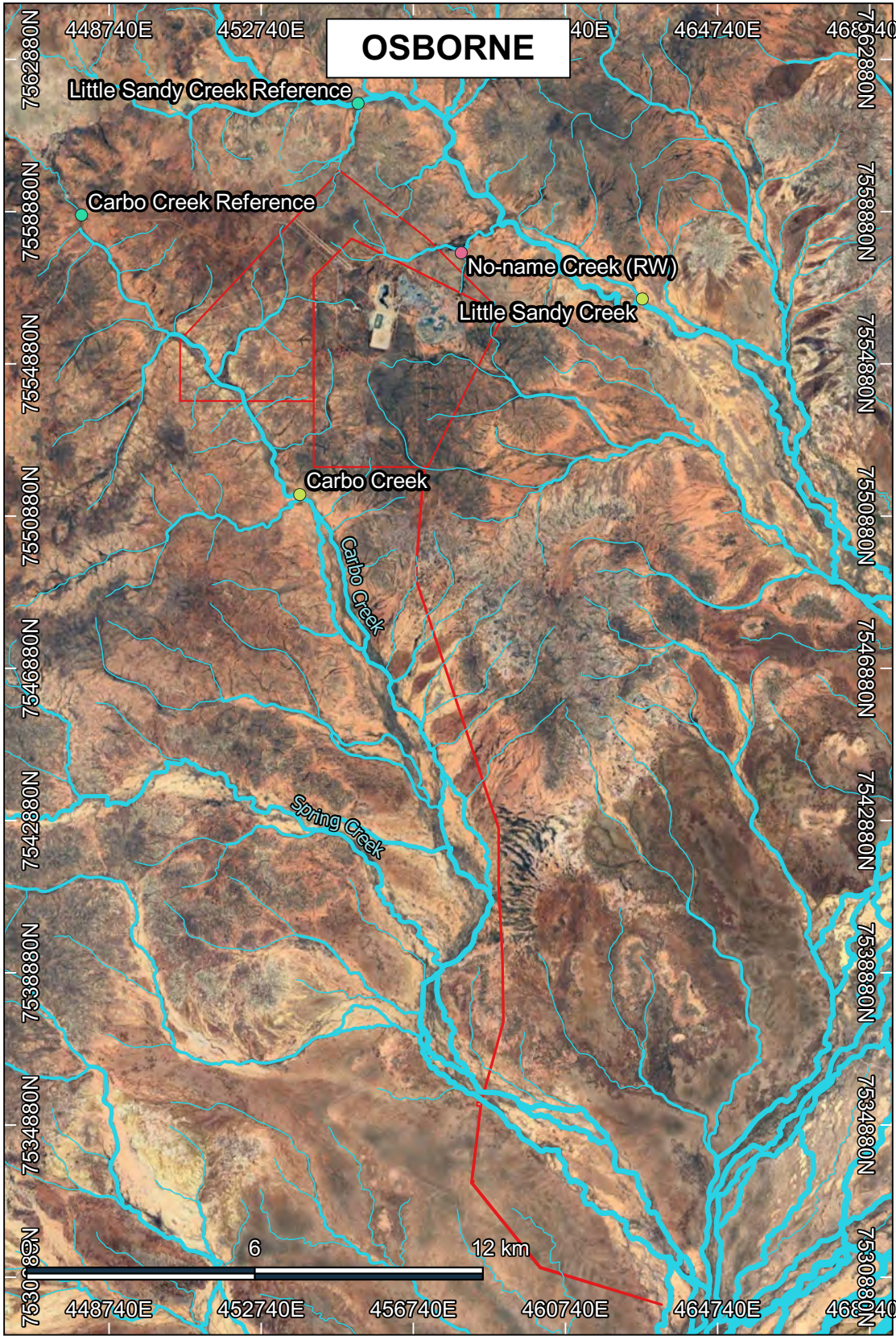
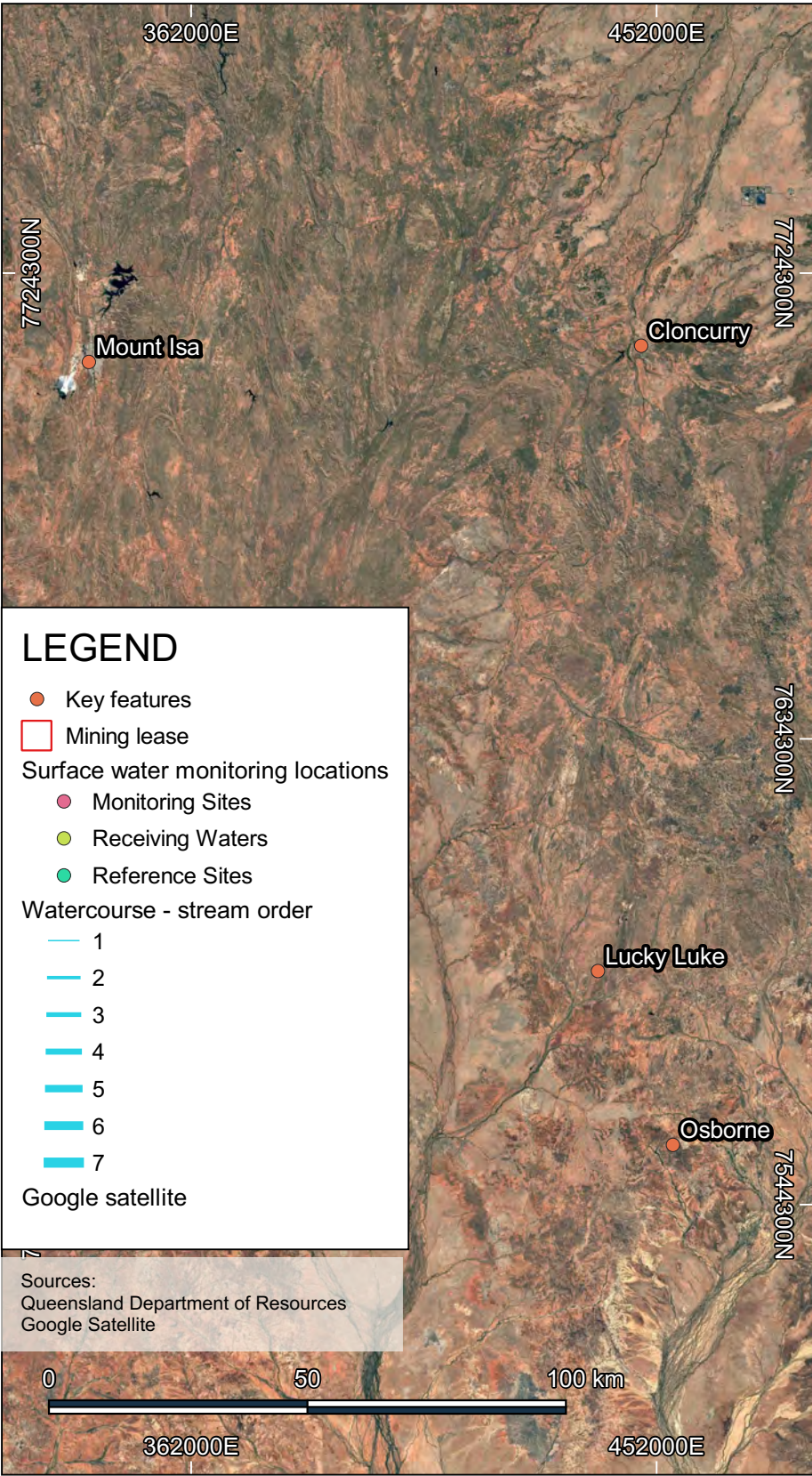
4. Trigger levels based on administering authority policy.

5. Monitoring must commence when processing of ore from the Merlin underground commences.




*Note: Analysis for total metal concentrations.*



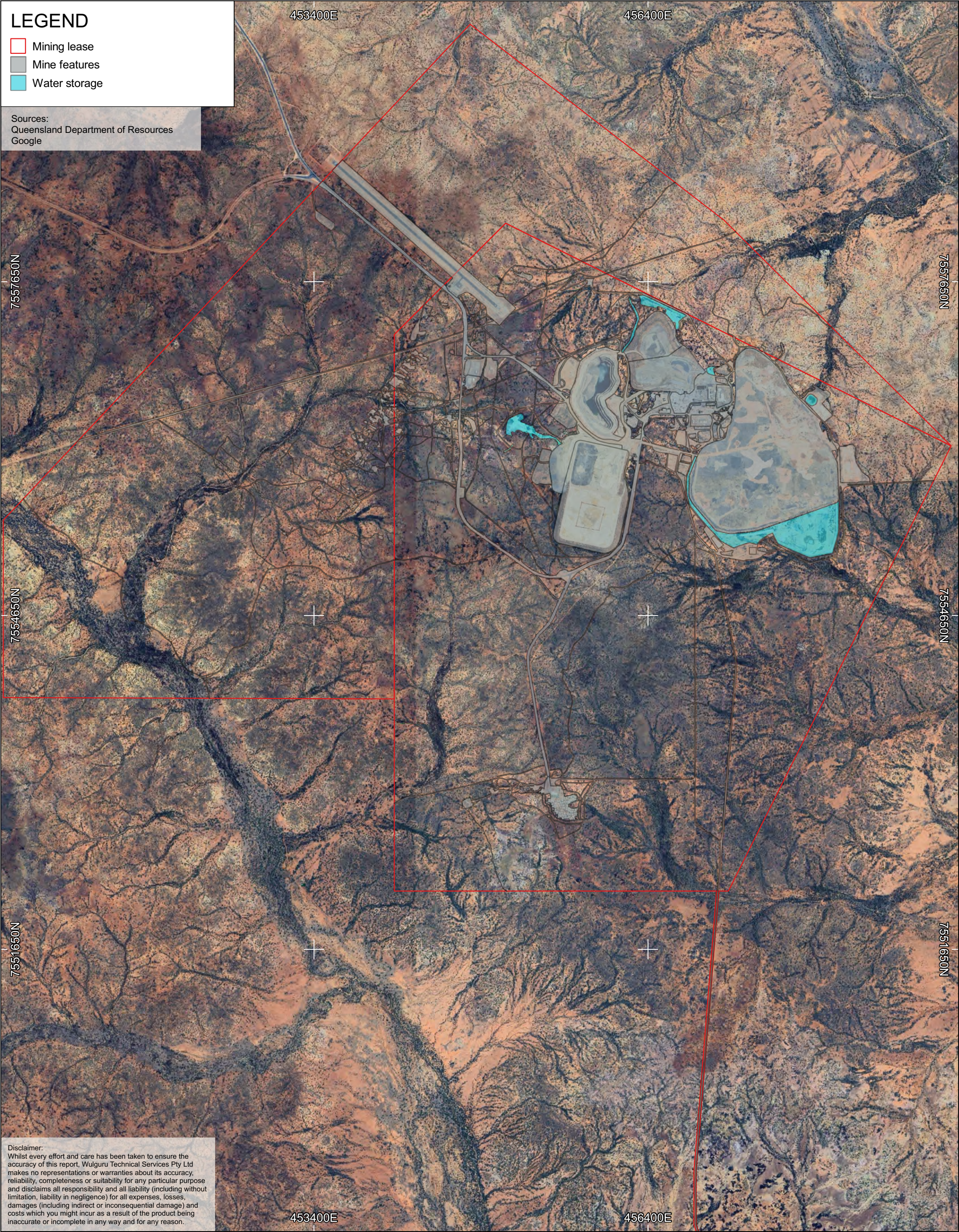


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**FIGURE 11. SURFACE WATER MONITORING LOCATIONS**

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			Author: H. Robb
			Version: 0.01
Project Number: 2025.03007		Client: Chinova Resources Pty Ltd	





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FIGURE 12. WATER STORAGES

<div><div><div></div></div><div>0.800.81.6 km</div></div> <div>CRS: GDA2020 / MGA zone 54 Scale: 1:30,000 @A3</div>	Date: 18 June 2025		<div><div></div><div>WULGURU TECHNICAL SERVICES</div></div>
	Author: H. Robb		
	Project Number: 2025.03007	Client: Chinova Resources Osborne Pty Ltd	



### **4.4.3. Groundwater**

#### **4.4.3.1. Groundwater Monitoring Network**

The groundwater monitoring network is described in Table 10 and in Figure 13 (Table C7 of the EA).

The Project groundwater monitoring program focusses on risk associated with the mine infrastructure area; the groundwater network comprises of reference monitoring, compliance monitoring, and observation bores. The proposed water storages are within the existing operational area and are sufficiently captured within the existing network and monitoring program.

**Table 10. Groundwater monitoring network - EPML00873613 Table C7**

Monitoring Point	Description	Coordinates (MGA 94, Z54)		Surface RL <sup>1</sup> (m)	Monitoring Frequency
		Northing	Easting		
Observation Bores					
New Bore Western/north-western side of Osborne open cut pit (targeting RL 1245M)	Osborne Open Cut Pit monitoring bore	7556541	455561	276.65	Quarterly
KWB001	Kulthor monitoring bore	7556746	454068	264.24	
KWB002	Kulthor monitoring bore	7556629	454006	263.51	
TSF2 MB1	Osborne TSF2 monitoring bore	7556767	457676	272.56	
TSF2 MB3a	Osborne TSF2 monitoring bore	7555813	456937	267.91	
TSF2 MB4a	Osborne TSF2 monitoring bore	7557005	457439	276.64	
TSF2 MB5	Osborne TSF2 monitoring bore	7556439	457045	272.89	
TSF2 MB6	Osborne TSF2 monitoring bore	7556363	457948	264.99	
TSF2 MB7	Osborne TSF2 monitoring bore	7556620	457773	265.29	
TSF2 MB9	Osborne TSF2 monitoring bore	7555086	457115	256.69	
TSF2 MB10	Osborne TSF2 monitoring bore	7555059	458126	256.92	
Compliance Bores					
TSF1 P1	Osborne TSF1 monitoring bore	7555919	456211	280.81	
TSF1 P2	Osborne TSF1 monitoring bore	7555919	456209	280.75	
TSF1 P3	Osborne TSF1 monitoring bore	7555225	455622	280.86	
TSF1 P4	Osborne TSF1 monitoring bore	7555225	455620	280.94	
TSF1 MB1	Osborne TSF1 monitoring bore	7556014	455358	276.48	
TSF1 P7	Osborne TSF1 monitoring bore	7555467	456217	285.10	
TSF1 P8	Osborne TSF1 monitoring bore	7555466	456216	285.05	
TSF2 MB11	Osborne TSF2 monitoring bore	7555221	457017	268.88	
TSF2 MB12	Osborne TSF2 monitoring bore	7556558	457017	263.57	

Monitoring Point	Description	Coordinates (MGA 94, Z54)		Surface RL <sup>1</sup> (m)	Monitoring Frequency
		Northing	Easting		
LLMB5	Lucky Luke monitoring bore	7588860	440457	304	Quarterly on commencement of mining at Lucky Luke
LLMB6	Lucky Luke monitoring bore	7588162	440982	297	
LLMB7	Lucky Luke monitoring bore	7588816	441519	299	
Reference Bores <sup>2</sup> (Osborne and Cloncurry Projects)					
LLMB1	Lucky Luke reference bore	7589063	440566	300.60	Quarterly
LLMB2	Lucky Luke reference bore	7589696	440993	306.68	
BROLGA	Osborne and Cloncurry reference bore	7517727	451548	192	
MORT 1	Osborne and Cloncurry reference bore	7600388	452677	324	
MDWB10	Osborne and Cloncurry reference bore	7605428	447716	358.6	
MDWB12	Osborne and Cloncurry reference bore	7603223	448497	340	
MDWB16	Osborne and Cloncurry reference bore	7607944	447373	363	
MERB1	Osborne and Cloncurry reference bore	7619910	447448	396	

1. *RL measurement to be taken from top of bore casing*

2. *Reference site must:*

- *Be from the same bio-geographic and climatic region; and*
- *Have similar geology, soil types and topography; and*
- *Contain a range of habitats similar to those at the test sites; and*
- *Not be so close to the test site that any disturbance at the test site also results in a change at the reference site.*

a. *To be installed and details provided to the administering authority before 25 October 2016.*







## 4.5. Hydrogeology

### *Osborne and Kulthor*

Limited groundwater occurs throughout the Osborne and Kulthor Project area, with the majority occurring within fractures of the Proterozoic units or in isolated pockets along the weathered contact (AGE, 2023a). Three hydrostratigraphic units have been identified at the Osborne and Kulthor tenements (AGE, 2023a).

- **Fractured Metamorphics:** Due to the Proterozoic age and metamorphic nature of the Kuridala group, the unit is unlikely to have preserved porosity. Accordingly, limited groundwater is hosted within this hydrostratigraphic unit. Groundwater flow and movement within this unit is controlled by secondary porosity which results from fracturing; however, as this rock is highly competent, fracturing is limited.

Accordingly, the Osborne mine has almost no groundwater inflows. Limited inflows have been observed to occur in discrete fractured zones that are vertically separated. Inflows which were encountered during mining often ceased following initial mine dewatering. The average daily dewatering requirements for Osborne was about 4.69 L/s, between October 2009 and February 2010.

The Kulthor deposit is associated with a shear zone in the Proterozoic basement. As such, the ore forms a small, isolated fractured rock aquifer within the otherwise hydraulically tight formation. A six-day pumping test was conducted in the upper shear zone which indicated that groundwater was confirmed laterally to the shear zone which hosts the ore. This was confirmed through observations whilst mining. Estimated inflow rates between October 2009 and February 2010 was 6.91 L/s, which generally decreased with time.

- **Wilgunya Subgroup:** This hydrostratigraphic unit consists of Mesozoic shales and mudstones with low permeability or porosity. Accordingly, the aquifer potential of this unit is limited, as observed by the absence of groundwater inflows into the Osborne pit, which fully intersects this unit. Additionally, numerous groundwater bores which penetrate this unit are completely dry. Approximately 27 km south of the site, the Wilgunya Subgroup represents a cover sequence of the Great Artesian Basin (GAB). Early assessments for the Project concluded that there is no potential connection of the Project to the GAB by the Wilgunya Subgroup.
- **Weathered Contact:** The weathered contact, located between the fractured Metamorphics and the Wilgunya Subgroup is considered the hydrostratigraphic unit with the highest potential permeability. Although considered the most significant hydrostratigraphic unit in the Project area, the weathered contact has very limited aquifer potential. The balance of bores installed into this unit are perennially dry; however, some bores contain minor amounts of groundwater, generally less than a few meters.

A conceptual site model from AGE (2023) is presented in Figure 14.



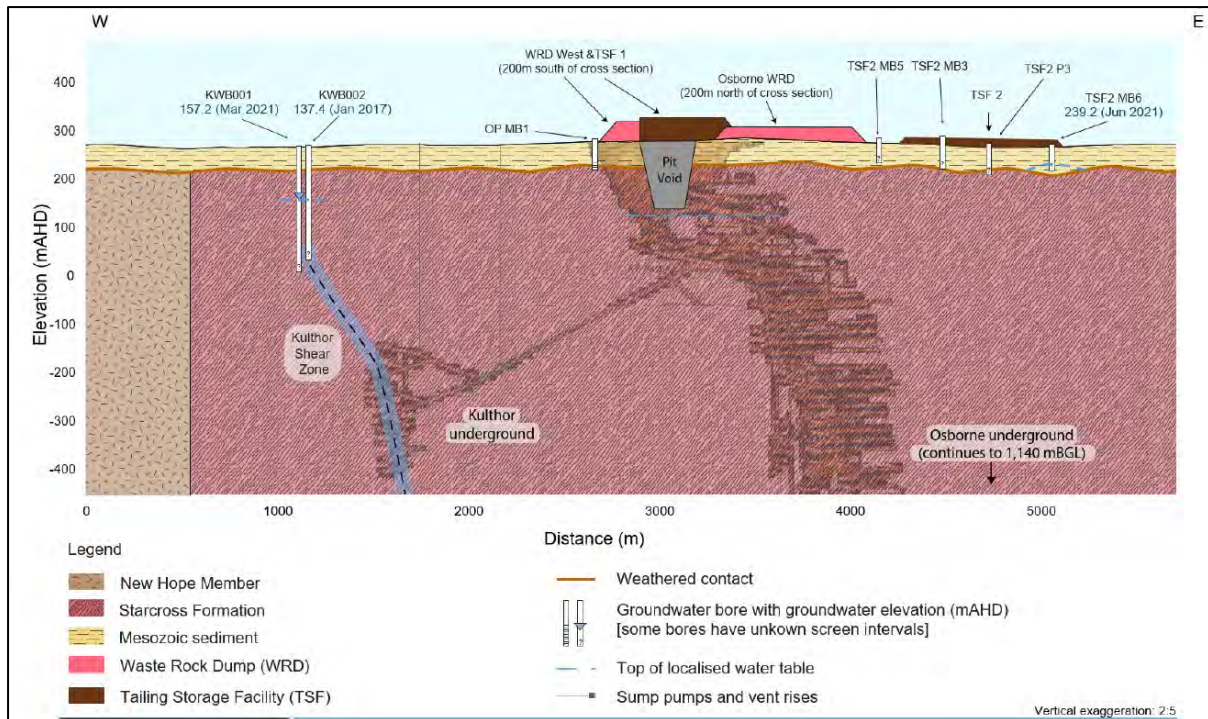


Figure 14. Conceptual Hydrogeological Model (AGE, 2023a)

### Lucky Luke

Three hydrostratigraphic units have been identified at Lucky Luke (Chinova, 2025).

- Alluvium:** Unconfined, ephemeral perched groundwater is located within the alluvium confined to the tributary of the Mort River, sited within the north-eastern corner of Lucky Luke. The alluvium within the tributary is contained laterally by pelitic and psammitic rocks and does not extend laterally beyond the main channel. The thickness of the alluvium is estimated to be approximately 5 m.
- Semi-confined Pelitic / Psammitic Sequence:** Fractured zones within the pelitic / psammitic sequence, above the mineralized zone, constitute the predominant aquifer at Lucky Luke (RLA, 2008). Groundwater occurs in fractures, joints, solution channels and along bedding plans to a depth of about 70 m. The permeability of this aquifer is considered low to moderate based on the geology.
- Confined Mineralised Zone Sequence:** Subsidiary aquifers may also occur within the deeper mineralised sequences. Exploration borehole data indicates that aquifers have a potential to form below 150 m. Similar to the semi-confined pelitic / psammitic sequence aquifer, it is expected that the permeability of the confined mineralised zone sequence is considered low (RLA, 2008).

## 4.6. Soils

### ***Osborne and Kulthor***

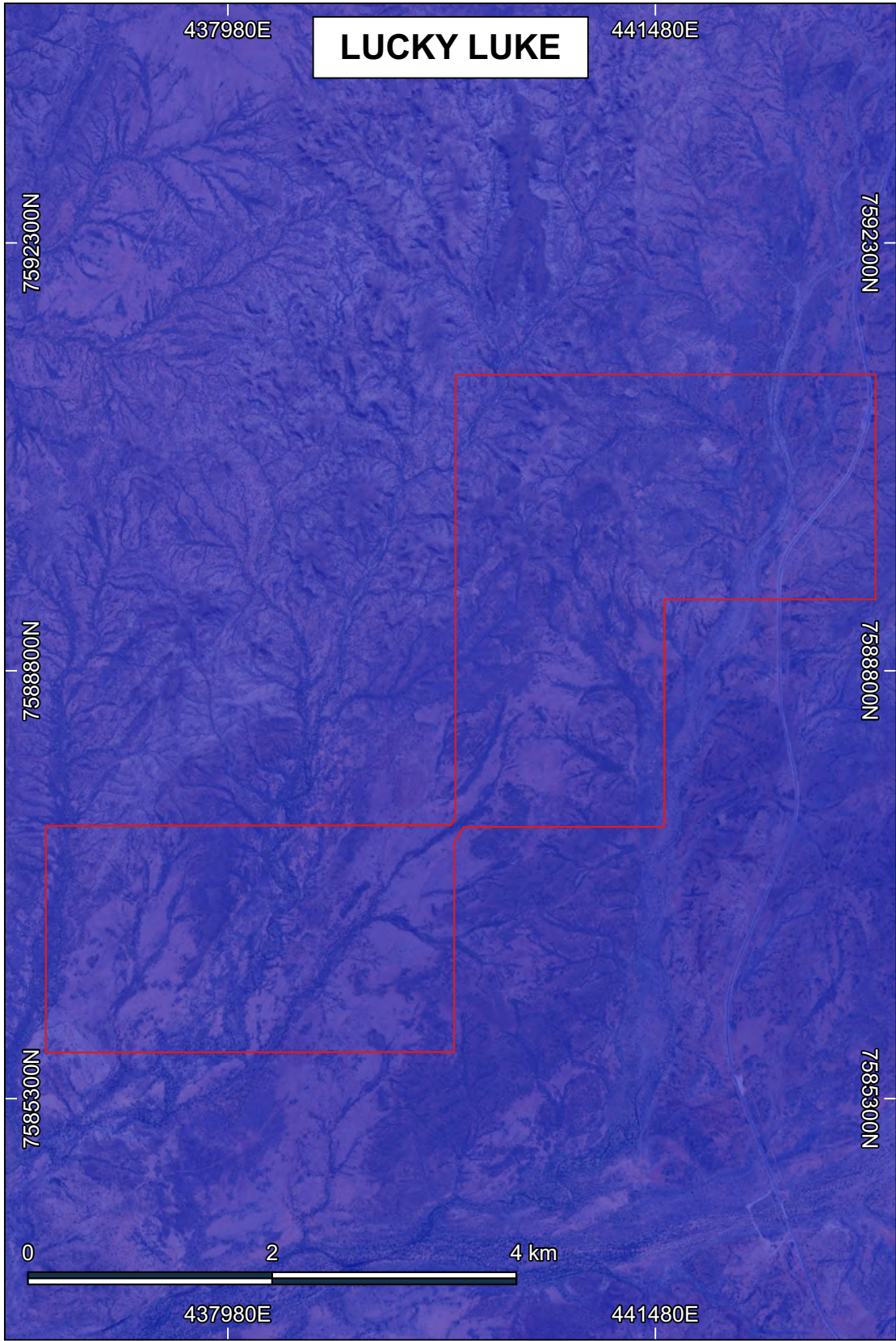
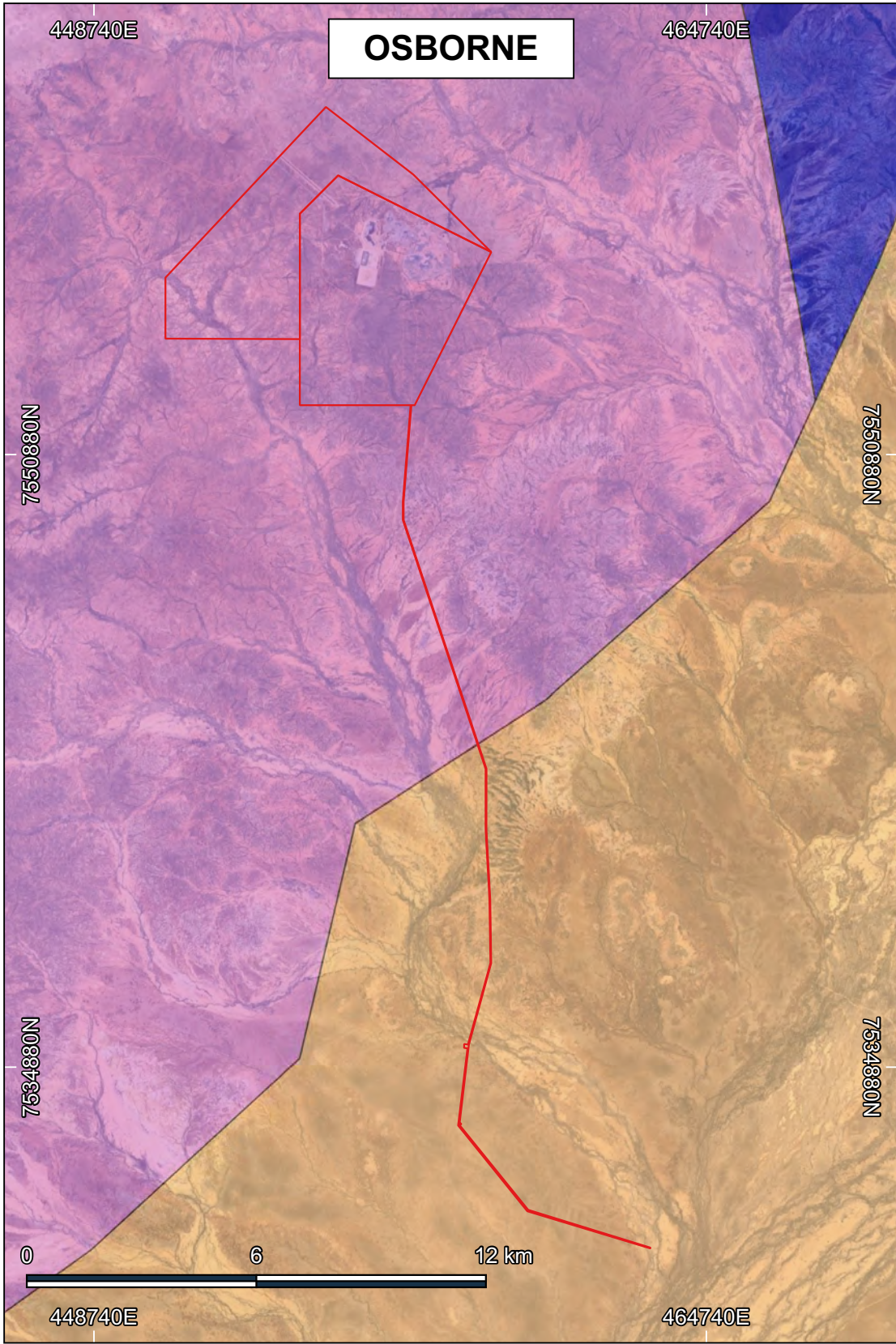
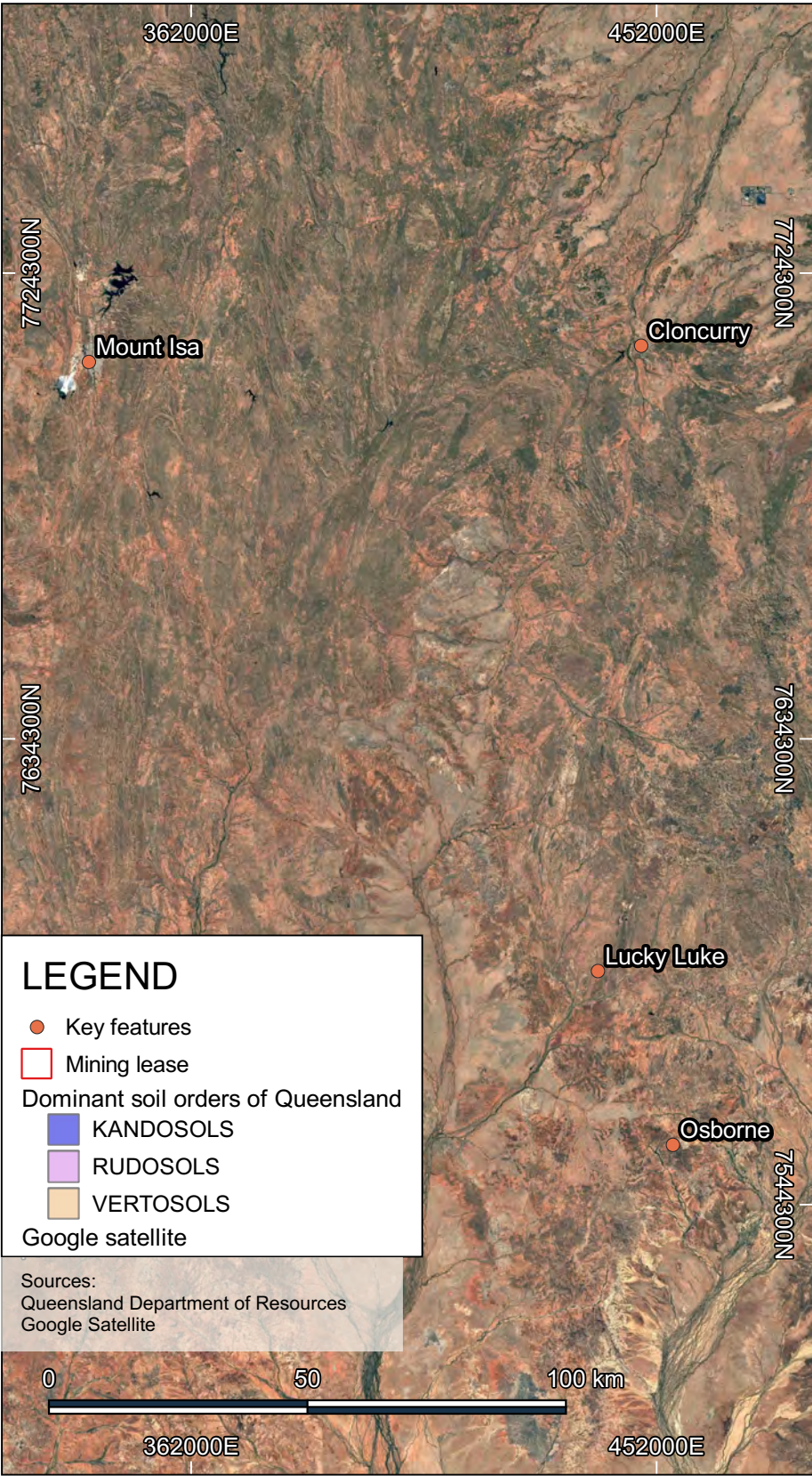
The Osborne and Kulthor tenements are located on a residual plateau on the north-western edge of the Queensland Mitchell Grass Downs, adjacent to the Northwest Highlands, and contains features of both bioregions. Soils within the Osborne and Kulthor tenements are typically shallow rocky or gravel clay loams, characterised by a predominantly rocky matrix. These soils exhibit low levels of infiltration and have limited moisture-holding capacity (Land Reclamation Services, 1994).

### ***Lucky Luke***

Soils throughout the Lucky Luke tenement were examined in the field to depths of 1.5 m by Muller in 2008. Onsite soils consisted of sandy loam, sandy clay loam or light clay, with the balance of soils slightly acidic to neutral (pH 5.6 – 7.0). The fertility of soils across the site is predominantly low, with nutrients identified at very low or low levels.



Soil mapping throughout all tenements has been illustrated in Figure 15.





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FIGURE 15. SOIL MAPPING

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			Author: H. Robb		
			Version: 0.01		
Project Number: 2025.03007		Client: Chinova Resources Pty Ltd			



## 4.7. Geology

### *Osborne and Kulthor*

The Osborne and Kulthor tenements are located within the Proterozoic Eastern Succession of the Mount Isa Inlier in north-west Queensland. The deposits at both tenements are comprised of hydrothermal copper-gold deposits, which are situated within a series of Proterozoic metamorphic rocks, associated with the Kuridala Group (AGE, 2023a). The Osborne deposit located within north-easterly dipping ironstones containing magnetite, chalcopyrite, pyrite, and pyrrhotite. The Kulthor deposit is contained within a narrow shear zone of amphibolite and pegmatite intrusives, bound by amphibolite, psammites, migmatites and gneisses.

A summary of the geologic units at Osborne-Kulthor is provided in Table 11 and illustrated in Figure 16.

**Table 11. Summary of Geologic Units at Osborne-Kulthor**

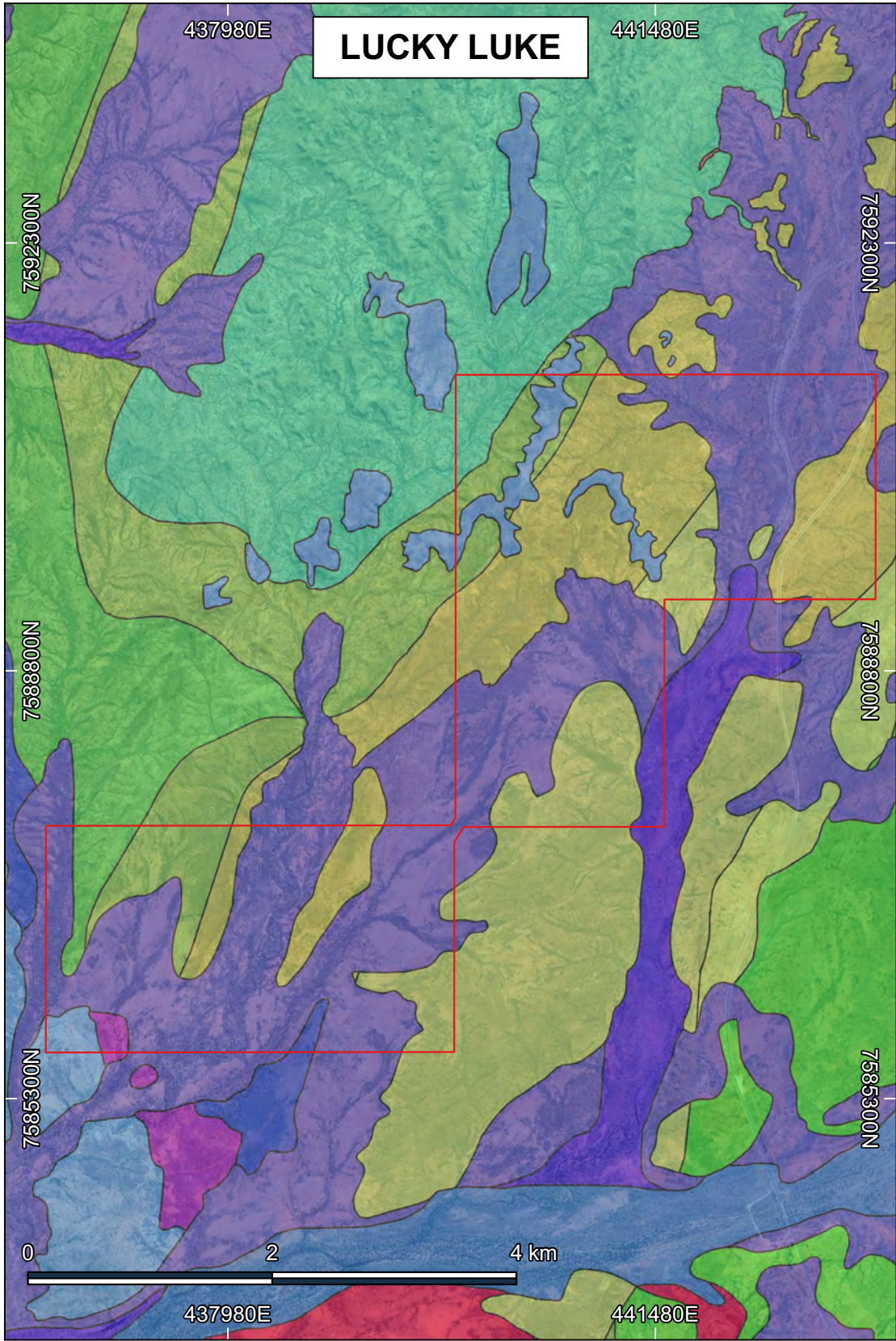
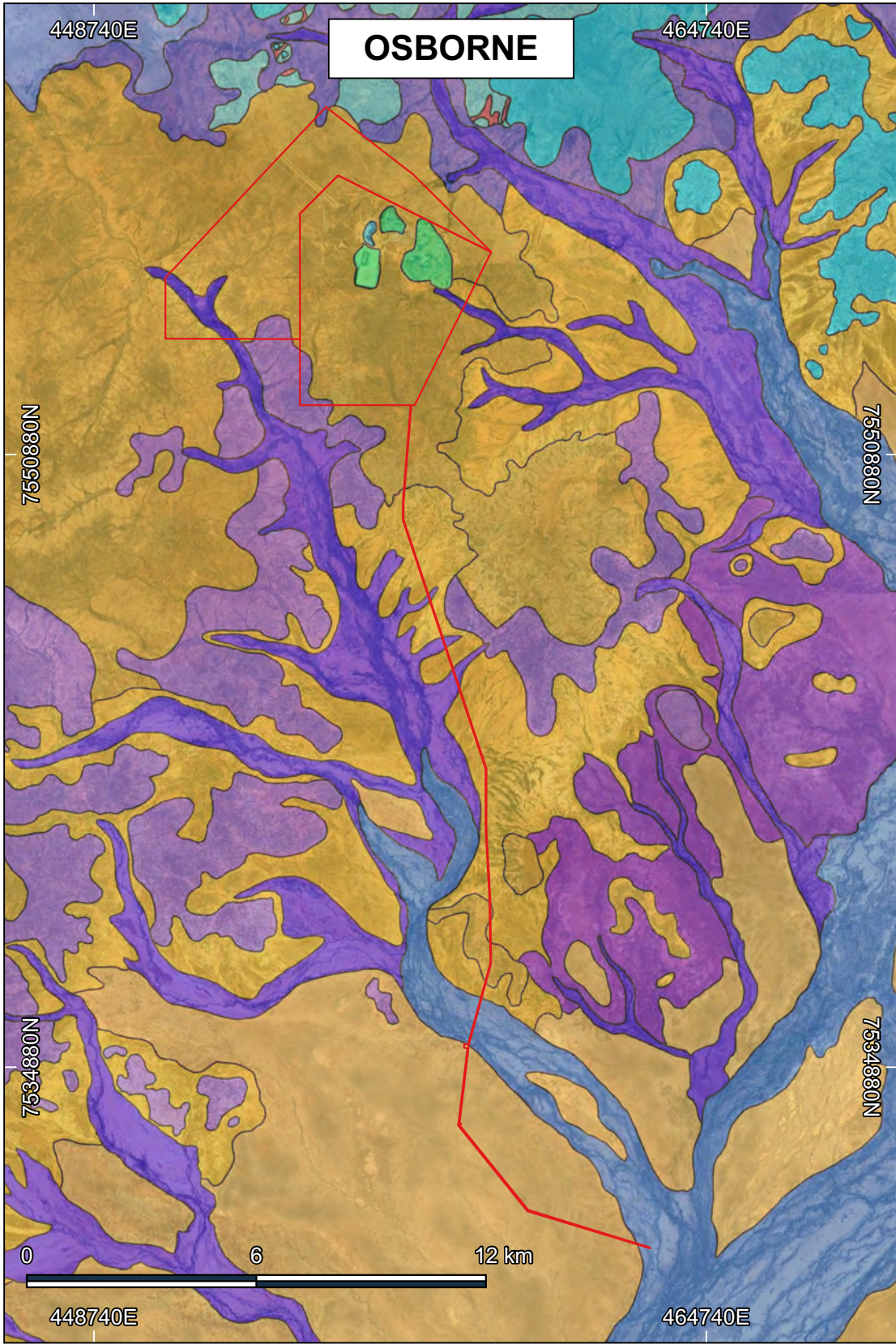
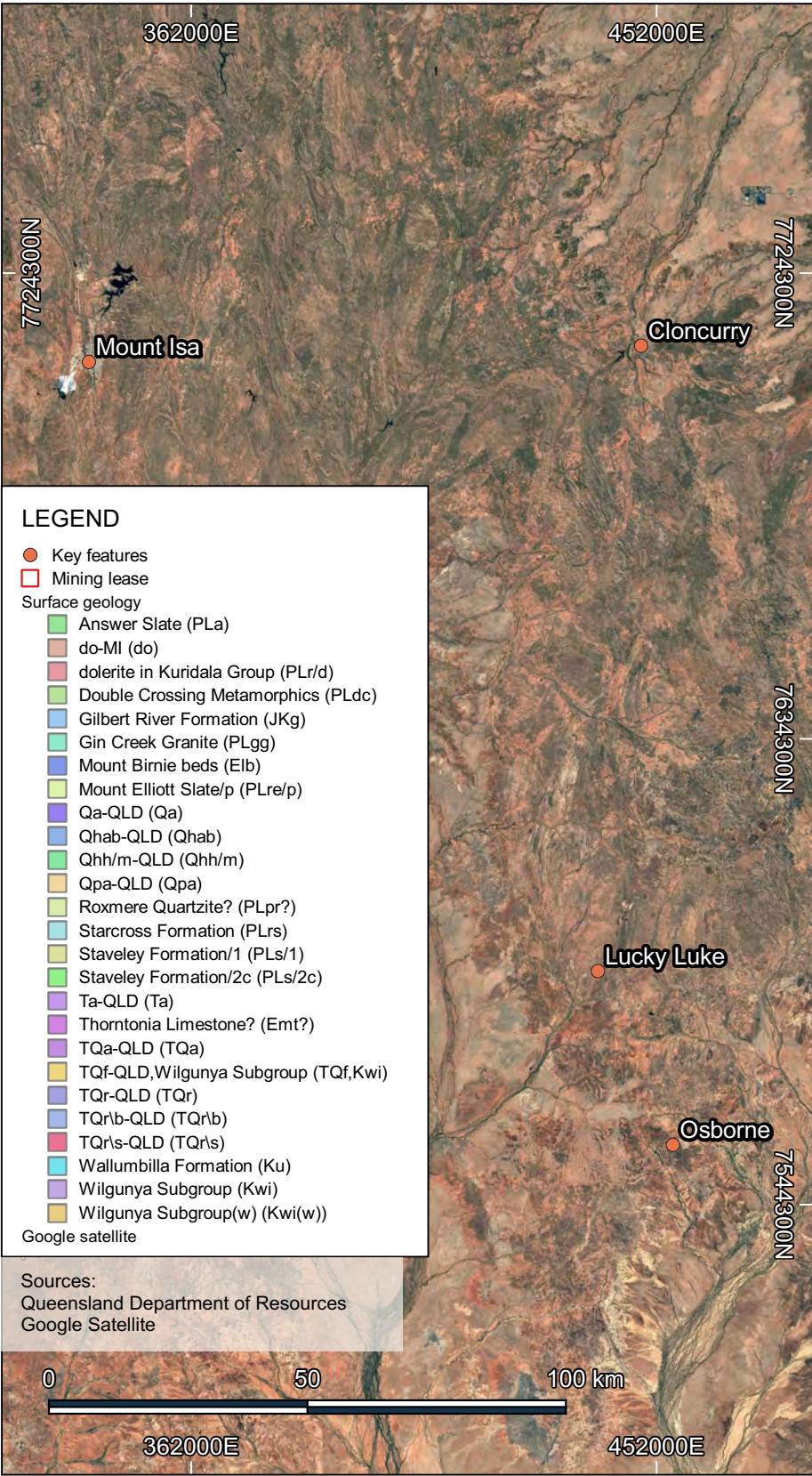
Group	Formation	Group Member	Description	Age
Mesozoic Sediments of the Wilgunya Subgroup			Highly weathered and mottled siltstones, sandy siltstones, sandstones, and silcretes.	Cenomanian to Early Cretaceous (93.9-145 +/-4 Ma)
Kuridala Group	Starcross Formation	-	Thin to thick-bedded, fine to medium-grained metapsammite and mica schist containing garnet, staurolite, and andalusite.	Statherian (1600 - 1679 +/- 11 Ma)
		New Hope Sandstone Member	Very thick to thick beds of very coarse to coarse grained quartz (commonly feldspathic) sandstone, locally interbedded with micaceous pelitic schist. In places exhibits normal grading associated with flat lamination and rare ripple cross-lamination.	Statherian (1600 - 1662 +/- 22 Ma)

### *Lucky Luke*

The Lucky Luke tenement is located within the southern end of the Mount Isa Inlier, which consists of early and middle Proterozoic rocks overlain by the Mesozoic Eromanga Basin to the north-east, the late Proterozoic-Palaeozoic Basin to the west and south, and younger Proterozoic sediments to the north-west. The Lucky Luke deposit is hosted within metasediments of the Proterozoic Doherty Formation and Stavely Formation, which trend north-south and are steeply dipping (Chinova, 2025).



The geological units at Lucky Luke are illustrated within Figure 16.





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FIGURE 16. PROJECT SURFACE GEOLOGY

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			Author: H. Robb	
	Project Number: 2025.03007	Client: Chinova Resources Pty Ltd	Version: 0.02	



## 4.8. Flora and Fauna

### 4.8.1. Regional Ecosystems

The Project is situated on the border of the Mitchell Grass Downs and the North West Highlands bioregions. Previous studies undertaken within the project area indicate that vegetation within the Project area generally conforms to North West Highland bioregion vegetation communities, typically consisting of eucalypt low open woodland with soft spinifex ground cover, particularly on ranges, ridges and plateaus. On elevated and steeper slopes, eucalypt woodland transitions into spinifex hummock grassland, while at lower elevations, occasionally transitions into acacia shrubland. Large alluvial areas support *Eucalyptus camaldulensis* (river red gum) riparian woodlands (NGH, 2023).

Mapped regional ecosystems (REs) were reviewed using the Queensland Globe interactive mapping tool (State of Queensland, 2025). Within the MLs and direct surrounds is a mosaic of non-remnant and remnant vegetation.

The ML area is largely classed as remnant under the *Vegetation Management Act 1999* (VM Act) with the current disturbance footprint classed as non-remnant. The mapped REs identified within and in direct surrounds of the MLs are described in Table 12 and mapped in Figure 17.

Small polygons of RE 1.3.7a are listed within the south-eastern extent of the Lucky Luke ML (90187). RE 1.3.7a is listed as 'Least Concern' under the VM Act; however, is listed as 'Endangered' biodiversity status (Appendix C).

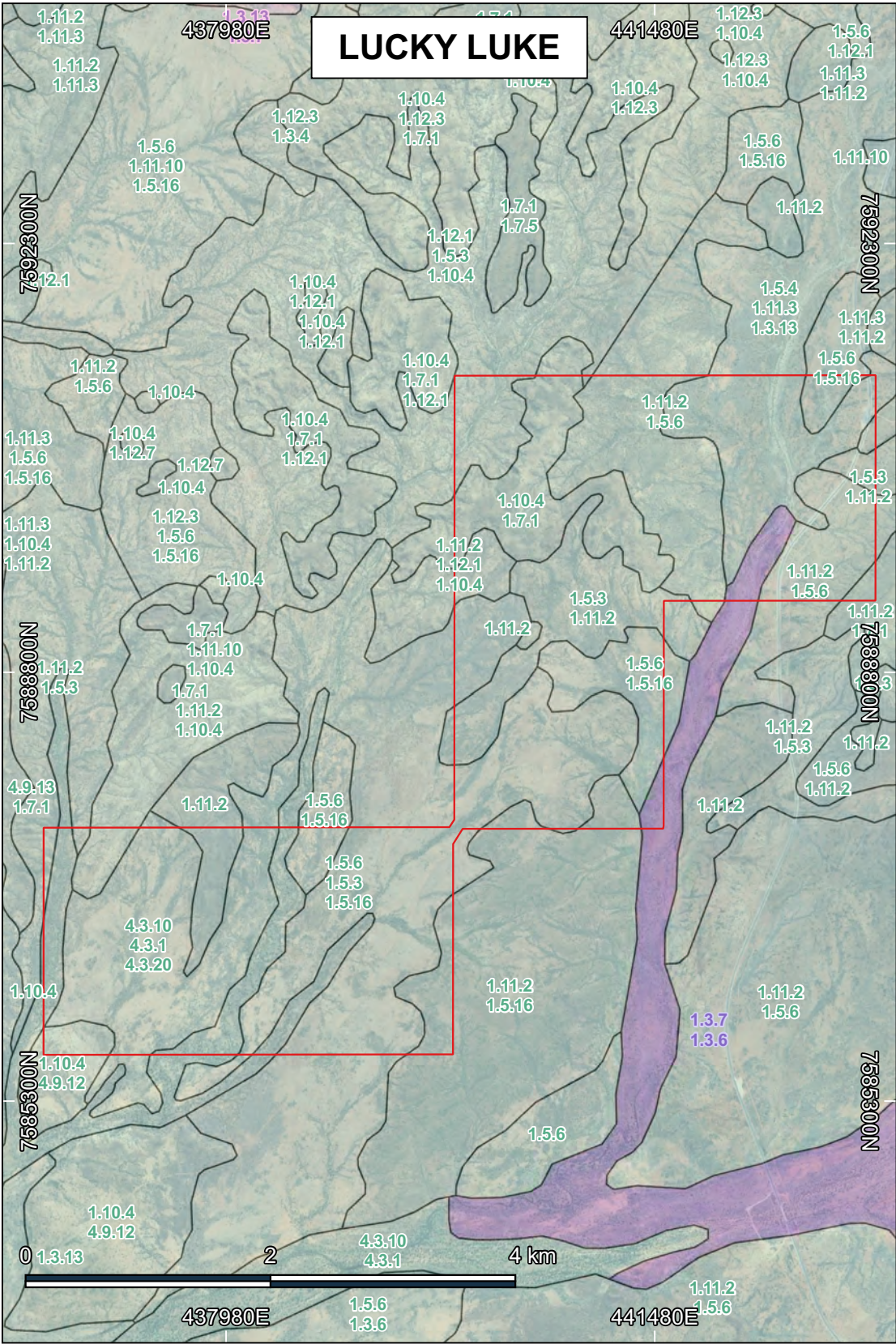
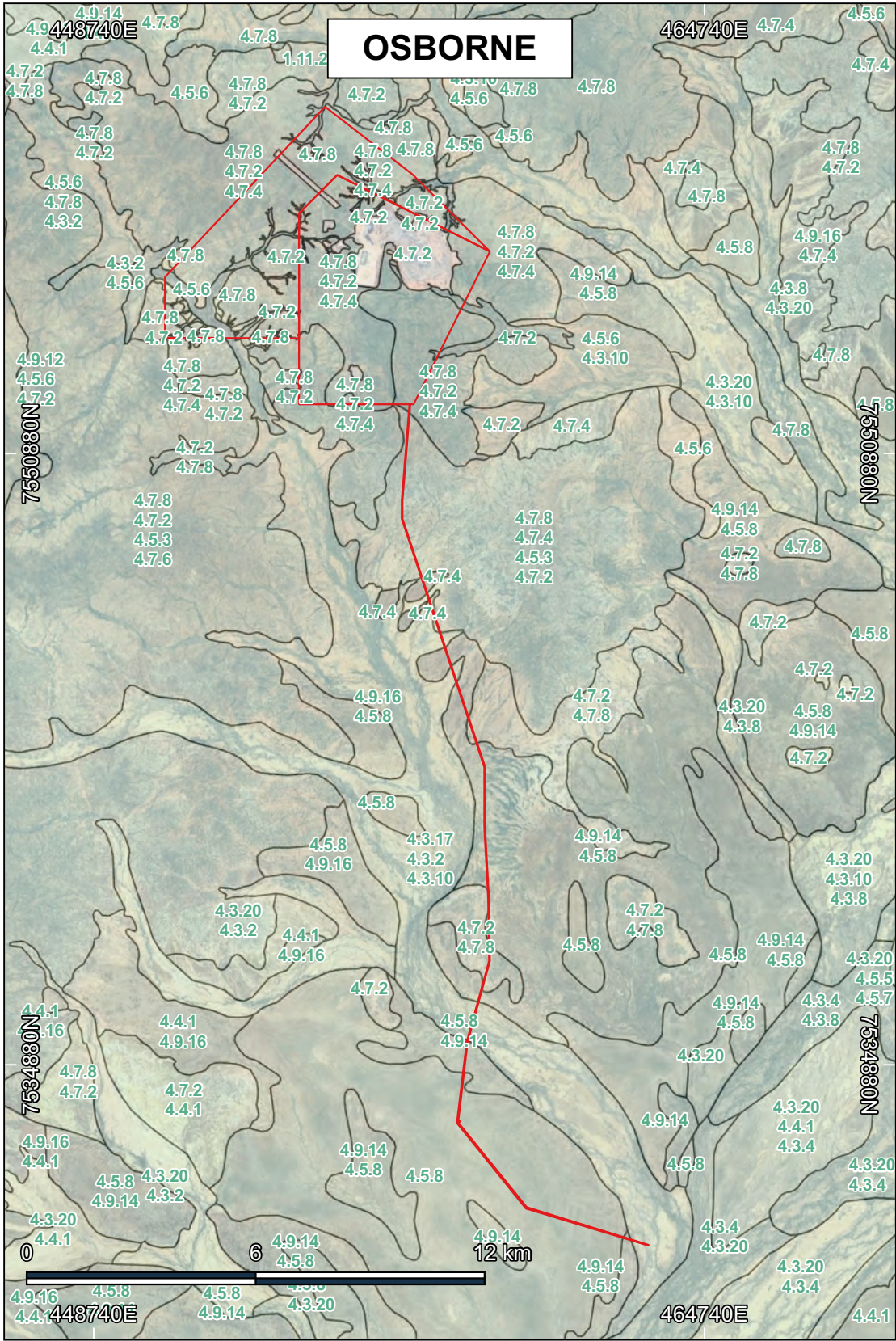
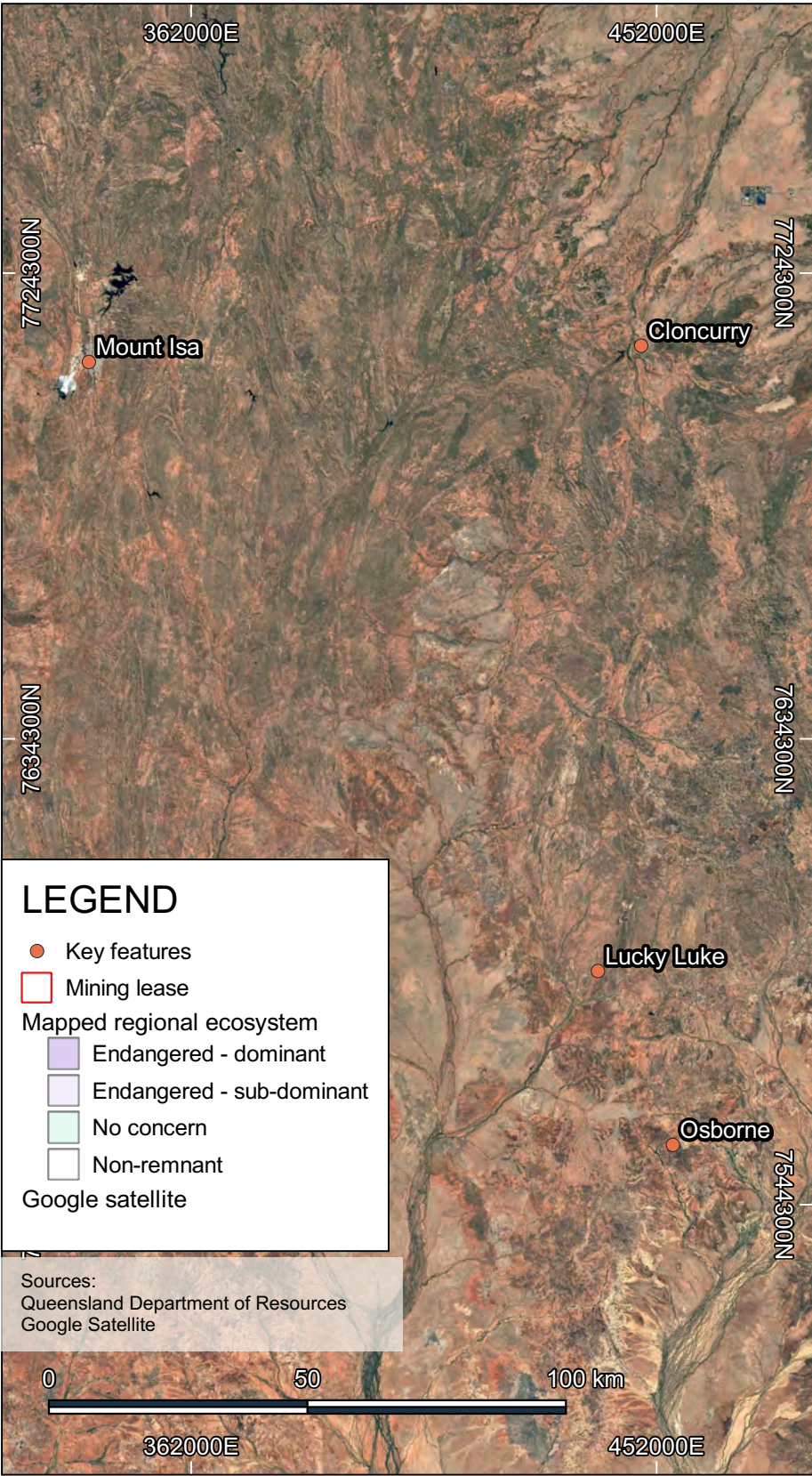
**Table 12. Mapped vegetation communities and current conservation status (DETSI, 2025a).**

Regional Ecosystem	Vegetation Description	VM Act (Qld)	Biodiversity Status
1.10.4a	Eucalyptus leucophloia low open woodland. Acacias usually prominent, forming shrublands in the far south. Ground cover of Triodia spp. and annual grasses. Occurs on near horizontally bedded sandstones and conglomerates; skeletal soils. Not a Wetland.	Least Concern	No concern at present
1.11.2a	Eucalyptus leucophloia low open woodland often with Corymbia terminalis, Corymbia capricornia, Terminalia aridicola and Eucalyptus leucophylla with shrub layer of Acacia spp. and ground layer of Triodia spp. Occurs on steep hills and strike ridges. Not a Wetland.	Least Concern	No concern at present
1.12.1	Eucalyptus leucophloia low open woodland on granites	Least Concern	No concern at present
1.3.13a	Woodland of Eucalyptus leucophylla, commonly with Corymbia terminalis, Acacia cambagei, Atalaya hemiglaucula and C. aparrerinja. Occasional canopy species include Corymbia confertiflora, Lysiphyllum cunninghamii and Eucalyptus pruinosa. The ground layer is a mix of tussock grasses and Triodia spp. Occurs on recent levees of larger watercourses and in-channel deposits of ephemeral streams. Not a Wetland.	Least Concern	No concern at present
1.3.6a	Corymbia aparrerinja woodland often with C. terminalis, Eucalyptus leucophylla, E. camaldulensis, Lysiphyllum cunninghamii and/or Acacia cambagei with a sparse ground layer of tussock grasses with Triodia longiceps in some places. Occurs on river terraces. Riverine.	Least Concern	No concern at present
1.3.7a	Eucalyptus camaldulensis fringing woodland to closed forest, usually with Lophostemon grandiflorus and Melaleuca leucadendra and/or M. fluviatilis. Occurs on recent levees and channel deposits of major watercourses and larger tributaries. Riverine.	Least Concern	Endangered
1.5.16	Acacia cambagei low woodlands on red earths	Least Concern	No concern at present
1.5.3	Eucalyptus leucophloia low open woodland to woodland on sandy and gravelly red soils	Least Concern	No concern at present
1.5.6c	Mixed low open woodland including Atalaya hemiglaucula, Acacia excelsa, Acacia cambagei, Ventilago viminalis, Grevillea striata, Hakea lorea subsp. lorea, Ehretia saligna, Corymbia terminalis and C. aparrerinja. Scattered shrub layer includes Acacia spp. and Carissa lanceolata. Mixed ground layer usually dominated by Aristida contorta, sometimes forming grasslands. Areas of Acacia aneura are occasionally present. Occurs on outwash plains from ranges of strongly folded pre-Cambrian rocks, usually adjacent to clay plains; red earths and clays. Not a Wetland.	Least Concern	No concern at present
1.7.1a	Eucalyptus leucophloia low open woodland. E. normantonensis may occur in the south of the bioregion. Triodia spp. ground layer. Occurs on lateritic surfaces and on silcrete. Not a Wetland.	Least Concern	No concern at present
4.3.10b	Mixed open woodland, with combinations of the species Corymbia terminalis, C. aparrerinja, Eucalyptus leucophylla and Grevillea striata. Acacia cambagei, E. coolabah and Atalaya hemiglaucula commonly occur. The ground layer is tussock grasses. Occurs on sandy and loamy levees of major watercourses. Sandy and loamy soils. Not a Wetland.	Least Concern	No concern at present

Regional Ecosystem	Vegetation Description	VM Act (Qld)	Biodiversity Status
4.3.17b	<i>Astrebla</i> spp. tussock grassland (commonly <i>A. elymoides</i> or <i>A. pectinata</i> ), commonly with <i>Eulalia aurea</i> , <i>Aristida latifolia</i> , <i>Bothriochloa</i> spp., <i>Iseilema</i> spp. Emergent <i>Eucalyptus coolabah</i> may occur. Occurs on active Quaternary alluvial plains, commonly within braided alluvial systems. Cracking clay soils. Not a Wetland.	Least Concern	No concern at present
4.3.1a	<i>Eucalyptus camaldulensis</i> woodland, commonly with <i>Lophostemon grandiflorus</i> , <i>Lysiphyllum gilvum</i> , <i>Melaleuca fluviatilis</i> . Occurs on fringes of major watercourses in erosional landscapes. Not commonly braided. Sandy beds. Riverine.	Least Concern	No concern at present
4.3.20x1	Mixed tussock grassland, including combinations of the species <i>Aristida contorta</i> , <i>Eragrostis</i> spp., <i>Eulalia aurea</i> , <i>Astrebla</i> spp., <i>Aristida latifolia</i> and <i>Chrysopogon fallax</i> . Emergent <i>Eucalyptus coolabah</i> and <i>Acacia cambagei</i> may occur. Occurs on highly active Quaternary alluvial plains of major watercourses. Reddish to pale sandy and loamy soils. Not a Wetland.	Least Concern	No concern at present
4.3.2a	Mixed low woodland, with combinations of the species <i>Eucalyptus coolabah</i> , <i>E. camaldulensis</i> , <i>Acacia cambagei</i> , <i>Lysiphyllum gilvum</i> , <i>E. leucophylla</i> and <i>A. aneura</i> . <i>Corymbia terminalis</i> and <i>C. aparrerinja</i> may occur in the canopy. Occurs on fringes of minor watercourses in erosional landscapes with a mixture of coarse and fine grained parent materials. Southwestern Downs subregion. Riverine.	Least Concern	No concern at present
4.5.3x70	<i>Acacia aneura</i> and/or <i>A. cambagei</i> low open woodland, occasionally with <i>E. georginae</i> . Emergent <i>Corymbia terminalis</i> may occur. A variable shrub layer may occur, including <i>Senna</i> spp., <i>Eremophila</i> spp. and <i>Acacia</i> spp. The ground layer is patchy with <i>Triodia</i> spp. and tussock grasses. Occurs on silcrete rises and lateritic plateau residuals derived from deeply weathered Cretaceous mudstones. Skeletal soils. Not a Wetland.	Least Concern	No concern at present
4.5.6x1	Mixed low open woodland, with a combination of the species <i>Atalaya hemiglauca</i> , <i>Corymbia terminalis</i> , <i>Acacia cambagei</i> , <i>Corymbia aparrerinja</i> , <i>Grevillea striata</i> , <i>Acacia cambagei</i> , <i>Eucalyptus leucophylla</i> and <i>Acacia aneura</i> . The ground layer is patchy tussock grasses. Occurs on outwash plains and residual sand sheets, commonly overlying Tertiary clay deposits. Red-brown loamy soils, commonly with surface gravel lag. Not a Wetland.	Least Concern	No concern at present
4.5.8x2	Mixed open tussock grassland, with a combination of the species <i>Aristida contorta</i> , <i>Eragrostis setifolia</i> , <i>Eriachne pulchella</i> , <i>Brachyachne convergens</i> and <i>Iseilema vaginiflorum</i> . Other species include <i>Astrebla pectinata</i> , <i>Dactyloctenium radulans</i> , <i>Trianthema triquetra</i> , <i>Portulaca</i> spp. and <i>Sclerolaena</i> spp. Occurs on Tertiary deposits of gravel and eroded lateritic material, primarily in the west of the bioregion. Not a Wetland.	Least Concern	No concern at present
4.7.2x1c	<i>Triodia</i> spp. hummock grassland. Emergent <i>Eucalyptus leucophloia</i> , <i>A. aneura</i> , <i>Acacia cambagei</i> and <i>E. normantonensis</i> may occur. Scattered shrubs may occur. Occurs on narrow, intact surfaces of lateritic plateaus, derived from deeply weathered Cretaceous mudstones. Skeletal soils. Not a Wetland.	Least Concern	No concern at present
4.7.4a	<i>Acacia cambagei</i> low woodland, occasionally with <i>A. aneura</i> . <i>A. cambagei</i> shrubs commonly occur. The ground layer is sparse, with <i>Triodia</i> spp. and tussock grasses. Occurs around the margins of Tertiary lateritic plateaus of deeply weathered Cretaceous mudstones. Skeletal soils. Not a Wetland.	Least Concern	No concern at present
4.7.8a	<i>Eucalyptus leucophloia</i> low open woodland, occasionally with <i>Acacia cambagei</i> , <i>E. normantonensis</i> and <i>A. aneura</i> . <i>Acacia chisholmii</i> shrubs may occur. <i>Triodia</i> spp. commonly dominate the ground layer. Occurs on lateritic residuals and plateaus derived from deeply weathered Cretaceous mudstones. Skeletal soils. Not a Wetland.	Least Concern	No concern at present



Regional Ecosystem	Vegetation Description	VM Act (Qld)	Biodiversity Status
4.9.12x4a	<i>Corymbia terminalis</i> and/or <i>Eucalyptus leucophylla</i> low open woodland, occasionally with <i>Atalaya hemiglauc</i> , <i>Denhamia oleaster</i> , <i>Acacia georginae</i> , <i>Grevillea striata</i> , <i>Ventilago viminalis</i> , <i>Hakea chordophylla</i> , <i>E. leucophloia</i> and <i>Acacia cambagei</i> . A shrub layer may occur, including <i>Senna</i> spp., <i>Eremophila</i> spp. And <i>Acacia</i> spp.. The ground layer is sparse tussock grasses. Occurs on undulating rises and low hills of Cambrian limestone. Shallow clays and skeletal soils. A thin veneer of Tertiary sand may occur on the surface. Not a Wetland.	Least Concern	No concern at present
4.9.14x44	<i>Acacia cambagei</i> low open woodland, occasionally with <i>Atalaya hemiglauc</i> . A shrub layer of <i>Acacia cambagei</i> commonly occurs. The ground layer is bare to very sparse tussock grasses and forbs. Occurs on high-level, Tertiary alluvial deposits associated with the Kynuna Plateau subregion. Red-brown clay soils, usually with a thick gravelly or cobbly surface. Not a Wetland.	Least Concern	No concern at present





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**FIGURE 17. MAPPED REGIONAL ECOSYSTEMS**

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			Author: H. Robb	
	Project Number: 2025.03007 Client: Chinova Resources Pty Ltd		Version: 0.01	



#### 4.8.2. Likelihood of Occurrence Analysis

A comprehensive desktop analysis was undertaken to identify potential environmental values, constraints, and potential impacts within the Project area to enhance understanding of the ecology of the area and its relationship to and connectivity with the surrounding landscape.

Each species of conservation significance returned in the 50 km radius search was assessed against the criteria in Table 13 to determine likelihood of occurrence (LOO) within the Project area.

**Table 13. Likelihood of occurrence criteria**

Status	Definition
Known	Species known to occur from recent reliable records* within the project area.
Likely	Recent reliable records of the species within 1 km of the project area and/or preferred habitat known to be present, and recent reliable records within 5 km.
Possible	Species recorded* within 50 km of the project area and/or suitable habitat mapped as present.
Unlikely	Species not recorded within 50 km of the project area or local habitat unsuitable

*\*Records less than 20 years old and from reputable sources using vetted data (primarily Wildnet)*

*\* May include older and unconfirmed records*

Central coordinates were established within each of Osborne and Lucky Luke. Coordinates are detailed within Table 14. The 50 km radius search was based on the below coordinates.

**Table 14. Central coordinates for searches**

Site	Coordinates	
	Longitude	Latitude
Osborne and Kulthor	140.5678	-22.0982
Lucky Luke	140.4252	-21.8097

#### 4.8.3. Matters of National Environmental Significance (MNES)

Matters of National Environmental Significance (MNES) include the following:

- World Heritage Properties;
- National Heritage Places;
- Wetlands of International Importance (Ramsar);
- Great Barrier Reef Marine Park;
- Commonwealth Marine Area and buffer zone;
- Listed Threatened Ecological Communities;
- Listed Threatened Species; and
- Listed Migratory Species.

A Protected Matters Search Tool (PMST) Report was generated for the Project area with a 50 km buffer area. There are no World Heritage Properties, National Heritage Places, Wetlands of International

Significance (Ramsar sites), or Commonwealth Marine Areas mapped to occur within the Project area or 50 km buffer (refer Appendix B: PSMT Report).

#### **4.8.3.1. Listed Threatened Ecological Communities**

No TECs are mapped to occur within the Project area. The PMST Report identified one listed TEC potentially present within the 50 km buffer – the community of native species dependent on natural discharge of groundwater from the Great Artesian Basin (Endangered).

#### 4.8.3.2. Listed Threatened Flora Species

No EPBC Act listed flora species were identified in the PMST as potentially occurring within the Project area or 50 km buffer.

#### 4.8.3.3. Listed Threatened Fauna Species

A total of 21 EPBC Act listed fauna species were identified in the PMST to potentially occur within the Project area or a 50 km buffer. The species and their listing under the EPBC Act are:

- Australian Painted Snipe (*Rostratula australis*) – Endangered, Marine
- Common Sandpiper (*Actitis hypoleucos*) – Migratory, Marine
- Curlew Sandpiper (*Calidris ferruginea*) – Critically endangered, Migratory, Marine
- Fork-tailed Swift (*Apus pacificus*) – Migratory, Marine
- Grey Falcon (*Falco hypoleucos*) – Vulnerable
- Grey Wagtail (*Motacilla cinerea*) – Migratory, Marine
- Latham's Snipe (*Gallinago hardwickii*) – Vulnerable, Migratory, Marine
- Night Parrot (*Pezoporus occidentalis*) – Endangered
- Oriental Plover (*Charadrius veredus*) – Migratory, Marine
- Oriental Pratincole (*Glareola maldivarum*) – Migratory, Marine
- Painted Honeyeater (*Grantiella picta*) – Vulnerable
- Pectoral Sandpiper (*Calidris melanotos*) – Migratory, Marine
- Plains-wanderer (*Pedionomus torquatus*) – Critically endangered
- Red Goshawk (*Erythrorhynchus radiatus*) – Endangered
- Sharp-tailed Sandpiper (*Calidris acuminata*) – Vulnerable, Migratory, Marine
- Yellow Wagtail (*Motacilla flava*) – Migratory, Marine
- Ghost Bat (*Macroderma gigas*) – Vulnerable
- Greater Bilby (*Macrotis lagotis*) – Vulnerable
- Julia Creek Dunnart (*Sminthopsis douglasi*) – Vulnerable
- Mertens' Water Monitor (*Varanus mertensi*) – Endangered
- Plains Death Adder (*Acanthophis hawkei*) – Vulnerable

Ground-truthing has not been undertaken on the Project site to investigate the presence of these EPBC Act listed threatened fauna and migratory species. The likelihood of occurrence assessment for these species can be found in Section 4.8.5.

#### 4.8.4. Matters of State Environmental Significance (MSES)

Matters of state environmental significance (MSES), as referred to in Schedule 2 of the *Environmental Offsets Regulation 2014*, include the following:

- Regulated vegetation;
- Connectivity areas;



- Wetlands and watercourses;
- Designated precinct in a strategic environmental area;
- Protected wildlife habitat;
- Protected areas;
- Protected marine areas and habitat; and
- Legally secured offset areas.

#### **4.8.4.1.1. Regulated Vegetation**

Regulated vegetation is vegetation managed through the *Vegetation Management Act 1999* (VM Act). Vegetation classifications described by the VM Act as being Category A, Category B, Category C, Category R or Category X are required to meet certain criteria prior to impact.

#### **4.8.4.1.2. Regulated Vegetation – Endangered or Of Concern Regional Ecosystem (Category B or C)**

The desktop assessment found no category B or C areas listed as ‘endangered’ or ‘of concern’ mapped within the Project area.

#### **4.8.4.1.3. Regulated Vegetation – Category R (GBR riverine regrowth)**

The desktop assessment found no category R (GBR riverine regrowth) mapped within the Project area.

#### **4.8.4.1.4. Regulated Vegetation - Essential habitat**

The desktop assessment found 9.2 ha of essential habitat mapped within the Project area, specifically within the Lucky Luke ML.

#### **4.8.4.1.5. Regulated Vegetation – Intersecting a Watercourse**

Remnant vegetation located within a defined distance from a watercourse is regulated vegetation. Regulated vegetation – intersecting a watercourse is mapped linearly and depicts the centreline of a watercourse.

The desktop assessment identified 55.06 km of stream order 1 and 2, and 8.47 km of stream order 3 regulated watercourse vegetation mapped within the Project disturbance areas (refer Figure 11 and **Appendix C: MSES Report**). To properly define this MSES, a buffer from the defining bank is required. The width of this buffer varies depending on the location of the bioregion and the stream order of the watercourse (Table 15). Within the Project area, there are therefore 180 ha of vegetation management watercourse and drainage features (Table 16).

**Table 15. Width of regulated vegetation from the defining banks of watercourses**

Bioregions/sub-region	Watercourse stream order	Distance from the defining bank (m)
Coastal	1 or 2	10
	3 or 4	25

Bioregions/sub-region	Watercourse stream order	Distance from the defining bank (m)
	5 or greater	50
Non-coastal	1 or 2	25
	3 or 4	50
	5 or greater	100

**Table 16. Distance from the defining banks of watercourse based on bioregions and stream order**

Non-coastal bioregion and sub-regions	Required distance from defining bank (m)	Distance of watercourse within Project Area (km)	Total regulated veg (ha)
1 or 2	25	55.06	137.65
3 or 4	50	8.47	42.35

#### **4.8.4.1.6. Regulated Vegetation – Within 100 m of a Vegetation Management Wetland**

The desktop assessment found no regulated vegetation – within 100 m of a vegetation management wetland mapped within the Project area.

#### **4.8.4.1.7. Wetlands and Watercourses**

No Ramsar internationally important wetlands or DIWA (Directory of Important Wetlands in Australia) nationally important wetlands were identified within the Project area.

Within the Project area, there are 55.06 km of stream order 1 and 2 watercourses, and 8.47 km of stream order 3 watercourses.

#### **4.8.4.2. Protected Wildlife Habitat**

##### **4.8.4.2.1. Protected Plant Habitat**

The Flora Survey Trigger Mapping – version 8.0 displays no high-risk areas in the vicinity of the Project area.

##### **4.8.4.2.2. Mapped Habitat Values**

Modelled potential habitat (from the Potential habitat models 2022 - Queensland) for flora and fauna listed as endangered, vulnerable or near threatened (EVNT) under the *Nature Conservation 1992 Act* (NC Act) mapped the flora species *Eremophila tetraptera* – Near threatened (NC Act), and fauna species Purple-necked Rock-wallaby (*Petrogale purpureicollis*) – Vulnerable (NC Act) as occurring within the Project area.

These species have been included within the likelihood of occurrence assessment within Section 4.8.5.

#### **4.8.4.2.3. NCA Listed Threatened Flora Species**

No flora species listed as EVNT under the NC Act were identified in the Wildnet Species List as potentially occurring within the Project area or a 50 km buffer.

Five flora species listed as Special Least Concern (SL) under the NC Act were identified in the Wildnet Species List. SL flora species under the NC Act are considered to be least concern plant species which are subject to harvest pressure because of their commercial value or their special characteristics. Accordingly, the SL guidelines do not relate to the clearing of protected plants. Accordingly, SL flora species under the NC Act were not included within the likelihood of occurrence assessment.

#### **4.8.4.2.4. NCA Listed Threatened Fauna Species**

One fauna species listed as EVNT and one species listed as SL under the NC Act were identified in the Wildnet Species List to potentially occur within the Project area or a 50 km buffer. The species and their listing under the NC Act are:

- Purple-necked Rock-wallaby (*Petrogale purpureicollis*) – Vulnerable
- Short-beaked Echidna (*Tachyglossus aculeatus*) – SL

#### **4.8.4.3. Protected Areas**

There are no protected areas (including all classes of protected area except coordinated conservation areas), as defined under the NC Act, mapped within the Project area.

#### **4.8.4.4. Legally Secured Offset Areas**

There are no legally secured offset areas mapped within the Project area.

#### **4.8.5. Likelihood of Occurrence of Conservation Significant Species**

A likelihood of occurrence assessment was undertaken for each species of conservation significance within the Project area and a 50 km buffer. The results of this assessment are discussed in Table 17.



**Table 17. Likelihood of Occurrence of Conservation Significant Species**

Common name ( <i>Scientific name</i> )	EPBC Act Status <sup>1</sup>	NC Act Status <sup>2</sup>	PMST <sup>3</sup>	WO <sup>3</sup>	ALA <sup>5</sup>	MPH <sup>7</sup>	Likelihood
<b>Birds (n<sup>7</sup>=16)</b>							
Australian Painted Snipe ( <i>Rostratula australis</i> )	E, Ma	E	May				Unlikely - no records are present within 50 km of the Project area.
Common Sandpiper ( <i>Actitis hypoleucos</i> )	M, Ma	SL	May				Unlikely - no records are present within 50 km of the Project area.
Curlew Sandpiper ( <i>Calidris ferruginea</i> )	CE, M, Ma	CR	May				Unlikely - no records are present within 50 km of the Project area.
Fork-tailed Swift ( <i>Apus pacificus</i> )	M, Ma	SL	Likely				Possible - species is widespread and common.
Grey Falcon ( <i>Falco hypoleucos</i> )	V	V	Likely				Unlikely - no records are present within 50 km of the Project area. Species exists at a low density across its range.
Grey Wagtail ( <i>Motacilla cinerea</i> )	M, Ma	SL	May				Unlikely - no records are present within 50 km of the Project area.
Latham's Snipe ( <i>Gallinago hardwickii</i> )	V, M, Ma	SL	May				Unlikely - no records are present within 50 km of the Project area.
Night Parrot ( <i>Pezoporus occidentalis</i> )	E	E	Likely				Unlikely - no records are present within 50 km of the Project area.
Oriental Plover ( <i>Charadrius veredus</i> )	M, Ma	SL	May				Unlikely - no records are present within 50 km of the Project area.
Oriental Pratincole ( <i>Glareola maldivarum</i> )	M, Ma	SL	May				Unlikely - no records are present within 50 km of the Project area.
Painted Honeyeater ( <i>Grantiella picta</i> )	V	V	Likely				Unlikely - no records are present within 50 km of the Project area.
Pectoral Sandpiper ( <i>Calidris melanotos</i> )	M, Ma	SL	May				Unlikely - no records are present within 50 km of the Project area.

Common name ( <i>Scientific name</i> )	EPBC Act Status <sup>1</sup>	NC Act Status <sup>2</sup>	PMST <sup>3</sup>	WO <sup>3</sup>	ALA <sup>5</sup>	MPH <sup>7</sup>	Likelihood
Plains-wanderer ( <i>Pedionomus torquatus</i> )	CE	CR	May				Unlikely - no records are present within 50 km of the Project area.
Red Goshawk ( <i>Erythrotriorchis radiatus</i> )	E	E	May				Unlikely - no records are present within 50 km of the Project area.
Sharp-tailed Sandpiper ( <i>Calidris acuminata</i> )	V, M, Ma	V	May				Unlikely - no records are present within 50 km of the Project area.
Yellow Wagtail ( <i>Motacilla flava</i> )	M, Ma	SL	May				Unlikely - no records are present within 50 km of the Project area.
<b>Mammals (n=6)</b>							
Ghost Bat ( <i>Macroderma gigas</i> )	V	E	May				Unlikely - no records are present within 50 km of the Project area.
Greater Bilby ( <i>Macrotis lagotis</i> )	V	E	May				Unlikely - no records are present within 50 km of the Project area.
Julia Creek Dunnart ( <i>Sminthopsis douglasi</i> )	V	E	May				Unlikely - no records are present within 50 km of the Project area. Most records for this species are centred around Julia Creek, with occasional outliers.
Kowari ( <i>Dasyuroides byrnie</i> )	E	E	May				Unlikely - no records are present within 50 km of the Project area.
Purple-necked Rock-wallaby ( <i>Petrogale purpureicollis</i> )		V		17	13	Yes	Possible – several records are present within 50 km from a central point within the Project. Species may occur in areas where suitably rocky habitat is present.
Short-beaked Echidna ( <i>Tachyglossus aculeatus</i> )		SL		2			Possible - species is widespread and common
<b>Reptiles (n=2)</b>							



Common name ( <i>Scientific name</i> )	EPBC Act Status <sup>1</sup>	NC Act Status <sup>2</sup>	PMST <sup>3</sup>	WO <sup>3</sup>	ALA <sup>5</sup>	MPH <sup>7</sup>	Likelihood
Mertens' Water Monitor ( <i>Varanus mertensi</i> )	E	E	May				Unlikely - no records are present within 50 km of the Project area. Watercourses mapped within and adjacent to the project are likely ephemeral and therefore not suitable for this species.
Plains Death Adder ( <i>Acanthophis hawkei</i> )	V	V	Known				Possible - species is known to occur within 50 km of the Project area. Some areas within or adjacent to the Project may provide suitable habitat for the species.

<sup>1</sup>EPBC Status – Environment Protection and Biodiversity Conservation Act (1999) Status. V – Vulnerable, E – Endangered, CE – Critically Endangered, NL – Not Listed, M – Migratory, Ma - Marine.

<sup>2</sup>NC ACTNC ACT Status – Nature Conservation Act (1992) Status. LC – Least Concern, SL – Special Least Concern, NT – Near Threatened, V – Vulnerable, E – Endangered, CR – Critically Endangered.

<sup>3</sup>Likelihood to occur within 50 km search radius around central coordinate in EPBC Act Protected Matters Report.

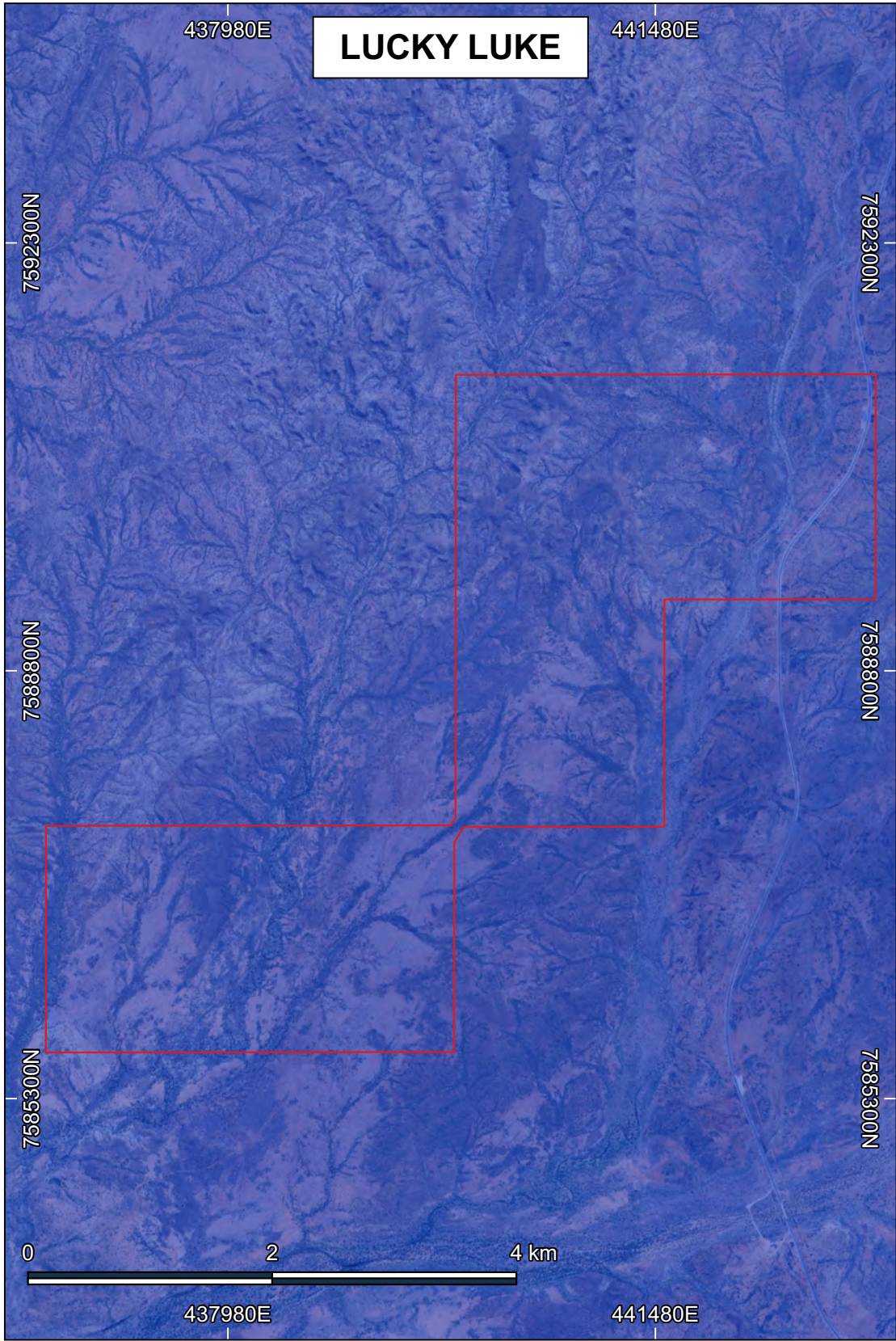
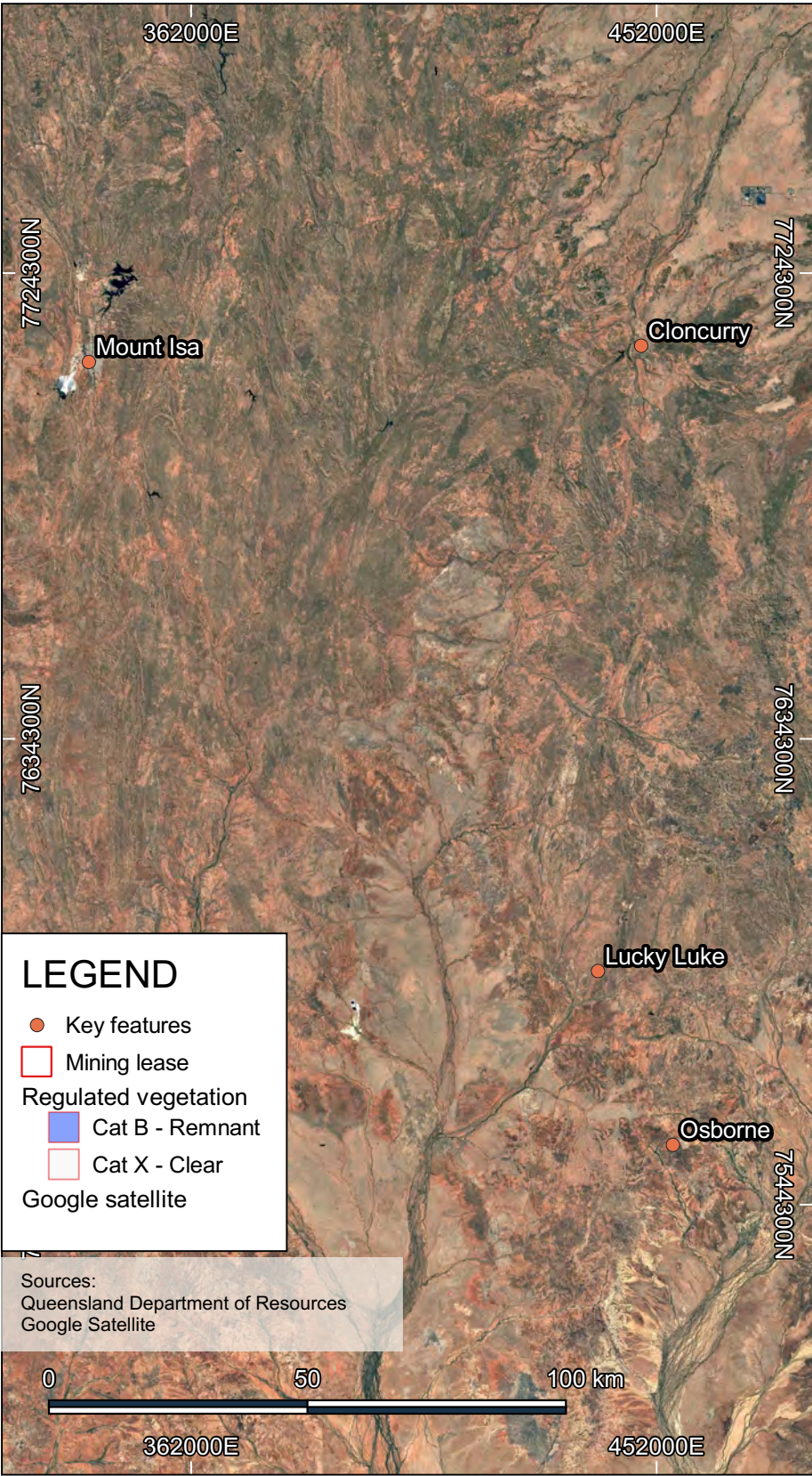
<sup>4</sup>Number of records within 50 km search radius around central coordinate in the Wildlife Online Database.

<sup>5</sup>Number of records within 50 km search radius around central coordinate in the Atlas of Living Australia Spatial Portal.

<sup>6</sup>Presence of Modelled Potential Habitat layer in QSpatial within the Project area.

<sup>7</sup>Number of species for each group.





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FIGURE 18. REGULATED VEGETATION



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CRS: GDA2020 / MGA zone 54

Date: 5 September 2025

Author: H. Robb

Version: 0.02



**WULGURU TECHNICAL  
SERVICES**

Project Number: 2025.03007

Client: Chinova Resources Pty Ltd



## 5. Potential Environmental Impacts and Management

### 5.1. Land Impacts

In preparing this application, consideration has been given to guideline *ESR/2015/1839 – Application requirements for activities with impacts to land* (DETSI, 2024c). DETSI is required to assess the application against the requirements stated in the *Environmental Protection Act 1994* and the EP Regulation to meet the environmental objective and performance outcomes described below:

#### **Environmental Objective**

*'The activity is operated in a way that protects the environmental values of land including soils, subsoils, landforms and associated flora and fauna.'*

#### **Performance Outcome**

There is no actual or potential disturbance or adverse effect to the environmental values of land as part of carrying out the activity, or

All of the following:

- a) activities that disturb land, soils, subsoils, landforms and associated flora and fauna will be managed in a way that prevents or minimises adverse effects on the environmental values of land, and
- b) areas disturbed will be rehabilitated or restored to achieve sites that are:
  - i. safe to humans and wildlife;
  - ii. non-polluting;
  - iii. stable; and
  - iv. able to sustain an appropriate land use after rehabilitation or restoration.
- c) the activity will be managed to prevent or minimise adverse effects on the environmental values of and due to unplanned releases or discharges, including spills and leaks of contaminants.
- d) the application of water or waste to land is sustainable and is managed to prevent or minimise adverse effects on the composition or structure of soils and subsoils.

#### **RISK OF ENVIRONMENTAL IMPACT: LOW**

##### **5.1.1. Overview of Land Impacts**

This amendment is for the reconciliation of on-ground disturbances (overclear) and inclusion of existing, but previously unauthorised structures (e.g., borrow pits, TSF2 East Environmental Dam, administration office, magazine, and topsoil stockpiles) within Table A1. Additionally, the amendment seeks to authorise the disposal of water and dam liners within the Osborne pit. No further clearing is proposed as part of this amendment.

The resolution of the existing authorising figures in the EA is poor, and it is difficult to determine the exact boundaries of authorised disturbance areas compared to unauthorised disturbance. For this

reason, the impact assessments presented in Sections 5.1 to 5.6 have considered the entire disturbance footprint as it exists today.

A retrospective impact assessment was undertaken for the reconciliation of on-ground disturbances (overclear) and inclusion of existing, previously unauthorised features. This assessment concluded that the total increase in surface disturbance was unlikely to have resulted in significant land impacts at the time of clearing.

An impact assessment was undertaken for the proposed disposal of water and dam liners within the Osborne pit. This assessment concluded that this amendment will not result in significant land impacts. Project activities will continue to be undertaken with existing management controls; no additional controls are required or proposed.

### **5.1.2. Flora and Fauna**

The flora and fauna impact assessment for has focussed on proposed amendments 1 and 2. The disposal of water and dam liners within the Osborne pit will have no impact on flora and fauna.

#### **5.1.2.1. Flora**

No listed EPBC flora species were identified to occur within the Project area.

#### **5.1.2.2. Fauna**

As detailed in the likelihood of occurrence assessment within Table 17, 21 EPBC Act listed, and 21 NC Act listed fauna species were identified to potentially occur within 50 km of the Project.

Of the EPBC Act listed species, two have been identified to have a “possible” likelihood of occurrence:

- Fork-tailed swift (*Apus pacificus*) – Migratory, Marine; and
- Plains death adder (*Acanthophis hawkei*) – Vulnerable.

Of the NC Act listed species identified to potentially occur within 50 km of the Project, two species not also listed under the EPBC Act were identified to have a “possible” likelihood of occurrence:

- Purple-necked rock-wallaby (*Petrogale purpureicollis*) – Vulnerable; and
- Short-beaked echidna (*Tachyglossus aculeatus*) – Special least concern.

An SRI assessment (Section 5.2.3) has been completed for the four identified EPBC and NC Act listed fauna species with a “possible” likelihood of occurrence.

### **5.1.3. Significant Residual Impact Assessment**

The Significant Impact Guidelines (DCCEEW, 2013) outline the criteria for determining whether an action is considered likely to have an impact on an EPBC Act listed species. An action is likely to have a significant impact on a critically endangered, endangered or vulnerable species if there is a real chance or possibility that it will:



- lead to a long-term decrease in the size of a population;
- reduce the area of occupancy of the species;
- fragment an existing population into two (2) or more populations;
- adversely affect habitat critical to the survival of a species;
- disrupt the breeding cycle of a population;
- modify, destroy, remove, isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline;
- result in invasive species that are harmful to a critically endangered or endangered species becoming established in the endangered or critically endangered species' habitat;
- introduce disease that may cause the species to decline; or
- interfere with the recovery of the species.

Criteria is similar for determining the likelihood of significant impact on an NC Act listed species. As stated in the Queensland Environmental Offsets Policy: Significant Residual Impact Guideline (DES, 2014), an action is likely to have a significant impact on endangered or vulnerable wildlife if the impact on the habitat is likely to:

- lead to a long-term decrease in the size of a local population; or
- reduce the extent of occurrence of the species; or
- fragment an existing population; or
- result in genetically distinct populations forming as a result of habitat isolation; or
- result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat; or
- introduce disease that may cause the population to decline; or
- interfere with the recovery of the species; or
- cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species.

Individual SRI assessments were completed for the five EVNT listed species with a likelihood status of "possible". SRI assessments considered impacts cumulatively, taking into account both approved disturbance areas, as well as the proposed amended disturbance areas (i.e. the total Project footprint as it exists currently). The assessments concluded that no SRI was likely to have occurred. Details of the assessments are outlined in Table 18 to Table 21.

**Table 18. Fork-tailed swift (*Apus pacificus*) – Migratory, Marine (EPBC Act)**

Is there a chance or possibility that an action will?	Response
Substantially modify (including by fragmenting, altering fire regimes, altering nutrient cycles or altering hydrological cycles), destroy or isolate an area of important habitat for a migratory species; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have substantially modified, destroyed or isolated an area of important habitat for a migratory species.</p> <p>There are no identified areas of important habitat in Queensland.</p> <p>There are no species records within 50 km of the Project area.</p> <p>Species is widespread and common, hence there is the potential for the species to transit through the site to reach suitable habitat elsewhere, however there is not likely to be an impact on any areas of important habitat for the species by works in the site.</p>
Result in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have resulted in an invasive species that is harmful to the migratory species becoming established in an area of important habitat for the migratory species.</p> <p>The Project will continue to operate under the <i>Biosecurity Act</i> (2014) and follow the General Biosecurity Obligation (GBO) to identify and manage any potential invasive species.</p> <p>There is the potential for the species to transit through the site to reach suitable habitat elsewhere, however there is not likely to be a significant impact on the species resulting from all historical disturbance and amended disturbance areas, due to the absence of the features necessary to the species' habitat.</p>
Seriously disrupt the lifecycle (breeding, feeding, migration or resting behaviour) of an ecologically significant proportion of the population of a migratory species.	<p><b>Unlikely:</b> Project works in the site are unlikely to have seriously disrupted the lifecycle of an ecologically significant proportion of the population of a migratory species.</p> <p>There are no species records within 50 km of the Project area.</p> <p>There are no known important populations in the vicinity of the site.</p> <p>Due to the absence of suitable habitat, the small size of the site, and connectivity of the surrounding habitat, there is not likely to have been a significant impact on the species resulting from historical disturbance and the amended disturbance areas.</p>
An action is likely to have a significant impact on a special least concern species if there is a real chance or possibility that any of the above-mentioned criteria are true – <b>No significant residual impact.</b>	



**Table 19. Plains death adder (*Acanthophs hawkei*) – Vulnerable (EPBC Act)**

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of an important population of the species; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have led to a long-term decrease in the size of an important population of the species.</p> <p>Species is known to occur within 50 km of the Project area.</p> <p>There are no known important populations in the vicinity of the site.</p> <p>Species habitat requirements are specific, and it is unlikely suitable habitat is present within the project area.</p> <p>There is not likely to have been a long-term decrease in the size of an important population of the species resulting from all historical disturbance and amended disturbance areas.</p>
Reduce the area of occupancy of an important population; or	<p><b>Unlikely:</b> Project works in the site are unlikely to reduce the area of occupancy of an important population.</p> <p>Species is known to occur within 50 km of the Project area.</p> <p>There are no known important populations in the vicinity of the site.</p> <p>Species habitat requirements are specific, and it is unlikely suitable habitat is present within the Project area. There is not likely to have been a reduction in the area of occupancy of an important population of the species resulting from all historical disturbance and amended disturbance areas.</p>
Fragment an existing important population into two or more populations; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have fragmented an existing important population.</p> <p>Species is known to occur within 50 km of the Project area.</p> <p>There are no known important populations in the vicinity of the site.</p> <p>Species habitat requirements are specific, and it is unlikely suitable habitat is present within the Project area.</p> <p>It is unlikely all historical disturbance and amended disturbance areas have resulted in fragmentation of an important population of the species.</p>
Adversely affect habitat critical to the survival of the species; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have adversely affected habitat critical to the survival of the species.</p> <p>Species is known to occur within 50 km of the Project area.</p> <p>Species habitat requirements are specific, and it is unlikely suitable habitat is present within the Project area.</p>

Is there a chance or possibility that an action will?	Response
Disrupt the breeding cycle of an important population; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have disrupted the breeding cycle of an important population of the species.</p> <p>Species is known to occur within 50 km of the Project area.</p> <p>There are no known important populations in the vicinity of the site.</p> <p>Species habitat requirements are specific, and it is unlikely suitable habitat is present within the project area.</p> <p>There is not likely to have been a significant impact on the breeding cycle of an important population of the species resulting from all historical disturbance and amended disturbance areas.</p>
Modify, destroy, remove, or isolate or decrease the availability or quality of habitat to the extent that the species is likely to decline; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have impacted habitat to the extent that the species is likely to decline.</p> <p>Species is known to occur within 50 km of the Project area.</p> <p>Species habitat requirements are specific, and it is unlikely suitable habitat is present within the project area, therefore there is not likely to have been a significant impact on the species' area of occupancy resulting from all historical disturbance and amended disturbance areas.</p> <p>It is unlikely all historical disturbance and amended disturbance areas have resulted in a decrease in quality of the species' habitat to the extent that the species is likely to decline.</p>
Result in invasive species that are harmful to a vulnerable species becoming established in the vulnerable species' habitat; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have introduced and/or allowed a harmful invasive species to become established in the habitat of the species.</p> <p>The main identified threat to the plains death adder is the introduced cane toad.</p> <p>The Project operates under the <i>Biosecurity Act</i> (2014) and follows the General Biosecurity Obligation (GBO) to identify and manage any potential invasive species.</p>
Introduce disease that may cause the species to decline; or	<p><b>Unlikely:</b> Project works are unlikely to have introduced novel diseases to the site.</p> <p>There are currently no known diseases that may cause the species to decline.</p> <p>The Project operates under the <i>Biosecurity Act</i> (2014) and follows the General Biosecurity Obligation (GBO) to identify and manage detrimental diseases or pathogens if present.</p>
Interfere substantially with the recovery of the species.	<p><b>Unlikely:</b> Project works in the site are unlikely to have interfered substantially with the recovery of the species.</p> <p>Species is known to occur within 50 km of the Project area.</p> <p>It is unlikely all historical disturbance and amended disturbance areas have interfered substantially with the recovery of the species.</p>
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that any of the above-mentioned criteria are true - <b>No significant residual impact.</b>	



**Table 20. Purple-necked rock-wallaby (*Petrogale purpureicollis*) – Vulnerable (NC Act)**

Is there a chance or possibility that an action will?	Response
Lead to a long-term decrease in the size of an important population of the species; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have led to a long-term decrease in the size of an important population of the species.</p> <p>There is modelled potential habitat within the Project area, and several species records within 50 km from the Project area.</p> <p>Geology within the Project area is not consistent with the specific habitat requirements for this species i.e. boulder piles, cliffs, and gorges in limestone areas, and sandstone and quartzite outcrops.</p> <p>There is not likely to have been a significant impact on a population of the species resulting from all historical disturbance and amended disturbance areas.</p>
Reduce the extent of occurrence of the species; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have reduced the extent of occurrence of the species.</p> <p>There is modelled potential habitat within the Project area, and several species records within 50 km from the Project area.</p> <p>Geology within the Project area is not consistent with the specific habitat requirements for this species i.e. boulder piles, cliffs, and gorges in limestone areas, and sandstone and quartzite outcrops.</p> <p>There is not likely to have been a significant impact on the species' extent of occurrence resulting from all historical disturbance and amended disturbance areas.</p>
Fragment an existing population; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have fragmented an existing important population.</p> <p>There is modelled potential habitat within the Project area and several species records within 50 km of the Project area.</p> <p>Geology within the Project area is not consistent with the specific habitat requirements for this species i.e. boulder piles, cliffs, and gorges in limestone areas, and sandstone and quartzite outcrops.</p> <p>There is not likely to have been a significant impact on a population of the species resulting from historical disturbance and amended disturbance areas.</p>
Result in genetically distinct populations forming as a result of habitat isolation; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have isolated areas of habitat to the extent that genetically distinct populations form.</p> <p>There is modelled potential habitat within the Project area and several species records within 50 km of the Project area.</p> <p>Geology within the Project area is not consistent with the specific habitat requirements for this species i.e. boulder piles, cliffs, and gorges in limestone areas, and sandstone and quartzite outcrops.</p> <p>There is not likely to have been a significant impact on a population of the species resulting from historical disturbance and amended disturbance areas.</p>

Is there a chance or possibility that an action will?	Response
Result in invasive species that are harmful to an endangered or vulnerable species becoming established in the endangered or vulnerable species' habitat; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have introduced and/or allowed a harmful invasive species to become established in the habitat of the species.</p> <p>The Project will continue to operate under the <i>Biosecurity Act</i> (2014) and follow the General Biosecurity Obligation (GBO) to identify and manage any potential invasive species.</p>
Introduce disease that may cause the population to decline; or	<p><b>Unlikely:</b> Project works are unlikely to have introduced novel diseases to the site.</p> <p>There are currently no known diseases that may cause the species to decline.</p> <p>The Project will continue to operate under the <i>Biosecurity Act</i> (2014) and follow the General Biosecurity Obligation (GBO) to identify and manage detrimental diseases or pathogens if present.</p>
Interfere with the recovery of the species; or	<p><b>Unlikely:</b> Project works are unlikely to have interfered with the recovery of the species.</p> <p>There is modelled potential habitat within the Project area and several species records within 50 km of the Project area.</p> <p>Geology within the Project area is not consistent with the specific habitat requirements for this species i.e. boulder piles, cliffs, and gorges in limestone areas, and sandstone and quartzite outcrops, and as such it is not likely a population of the species is present within the Project areas vicinity. There is not likely to have been a significant impact on the recovery of the species resulting from historical disturbance and amended disturbance areas.</p>
Cause disruption to ecologically significant locations (breeding, feeding, nesting, migration or resting sites) of a species.	<p><b>Unlikely:</b> Project works are unlikely to have caused disruption to ecologically significant locations of a species.</p> <p>There is modelled potential habitat within the Project area and several species records within 50 km of the Project area.</p> <p>Geology within the Project area is not consistent with the specific habitat requirements for this species i.e. boulder piles, cliffs, and gorges in limestone areas, and sandstone and quartzite outcrops.</p> <p>There is not likely to have been a significant impact on the species resulting from historical disturbance and amended disturbance areas.</p>
An action is likely to have a significant impact on a vulnerable species if there is a real chance or possibility that any of the above-mentioned criteria are true - <b>No significant residual impact.</b>	



**Table 21. Short-beaked echidna (*Tachyglossus aculeatus*) – Special least concern (NC Act)**

Is there a chance or possibility that an action will?	Response
A long-term decrease in the size of a local population; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have led to a long-term decrease in the size of a local population of the species.</p> <p>There is a single record 19 km south-east of the Project area.</p> <p>The species is widespread and common and has a solitary nature.</p> <p>Due to the widespread and solitary nature of the species, there is not likely to have been a significant impact on a population of the species resulting from all historical disturbance and amended disturbance areas.</p>
A reduced extent of occurrence of the species; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have reduced the extent of occurrence of the species.</p> <p>There are two records within 50 km of the Project area. The species is widespread and common and has a solitary nature.</p> <p>Due to the widespread and solitary nature of the species, there is not likely to have been a significant impact on the species' extent of occurrence resulting from all historical disturbance and amended disturbance areas.</p>
Fragmentation of an existing population; or	<p><b>Unlikely:</b> Project works in the site are unlikely to have fragmented an existing population.</p> <p>There are two records within 50 km of the Project area.</p> <p>The species is widespread and common and has a solitary nature.</p> <p>Due to the widespread and solitary nature of the species, there is not likely to have been a significant impact on a population of the species resulting from all historical disturbance and amended disturbance areas.</p>
Result in genetically distinct populations forming as a result of habitat isolation; or	<p><b>Unlikely:</b> Project works in the site are unlikely to result in genetically distinct populations forming as a result of habitat isolation.</p> <p>There are two records within 50 km of the Project area.</p> <p>The species is widespread and common and has a solitary nature.</p> <p>Due to the widespread and solitary nature of the species, there is not likely to have been a significant impact on a population of the species resulting from all historical disturbance and amended disturbance areas.</p>
Disruption to ecologically significant locations (breeding, feeding or nesting sites) of a species.	<p><b>Unlikely:</b> Project works in the site are unlikely to have caused disruption to ecologically significant locations of a species.</p> <p>There are two records within 50 km of the Project area. The species is widespread and common and has a solitary nature.</p> <p>Due to the widespread and solitary nature of the species, there is not likely to have been a significant impact on a population of the species resulting from all historical disturbance and amended disturbance areas.</p>
An action is likely to have a significant impact on a special least concern species if there is a real chance or possibility that any of the above-mentioned criteria are true - <b>No significant residual impact.</b>	

#### **5.1.4. Regional Ecosystems**

A retrospective assessment has been undertaken to determine the extent of vegetation clearing which was undertaken to establish the current mine footprint (i.e. all current disturbance). The pre-clear RE mapping was used to conservatively identify potential impacts. Affected REs are detailed below within Table 22.

All regional ecosystems mapped within the Project area are mapped as 'Least Concern' under the VM Act. Accordingly, all disturbance associated with the unauthorised features and overclear for authorised features, was located within areas classified as 'Least Concern' REs. Overclear for existing features is unlikely to have caused significant environmental impacts as it would have primarily affected vegetation adjacent already cleared areas that were subject to edge effects and were within proximity to existing mining operations.

No additional disturbances are required as part of this EA amendment and therefore no ongoing or future impact is anticipated.



**Table 22. Vegetation Impacted**

Feature	Area (ha)	RE	VM Act Status	Biodiversity Status
Borrow Pits	10.87	4.7.8a, 4.7.2x1c, 4.7.4a	LC, LC, LC	NC, NC, NC
TSF2 East Environmental Dam	0.79 (In Borrow Pits footprint)	4.7.8a, 4.7.2x1c, 4.7.4a	LC, LC, LC	NC, NC, NC
Administration Office	0.41	4.7.8a, 4.7.2x1c, 4.7.4a	LC, LC, LC	NC, NC, NC
Magazine	0.46	4.7.8a, 4.7.2x1c, 4.7.4a	LC, LC, LC	NC, NC, NC
Magazine Topsoil Stockpile	0.74	4.7.8a, 4.7.2x1c, 4.7.4a	LC, LC, LC	NC, NC, NC
Processing Plant Topsoil Stockpiles	0.91	4.7.8a, 4.7.2x1c, 4.7.4a	LC, LC, LC	NC, NC, NC
Overclear for all features	140.34	1.11.10b, 4.3.10b, 4.3.2a, 4.5.3x70, 4.7.2x1c, 4.7.8a, 1.11.2a, 4.3.1a, 4.3.4x2c, 4.5.8x2, 4.7.4a, 4.9.14x44	LC, LC, LC, LC, LC, LC, LC, LC, LC, LC	NC, NC, NC, NC, NC, NC, NC, NC, NC, NC, NC

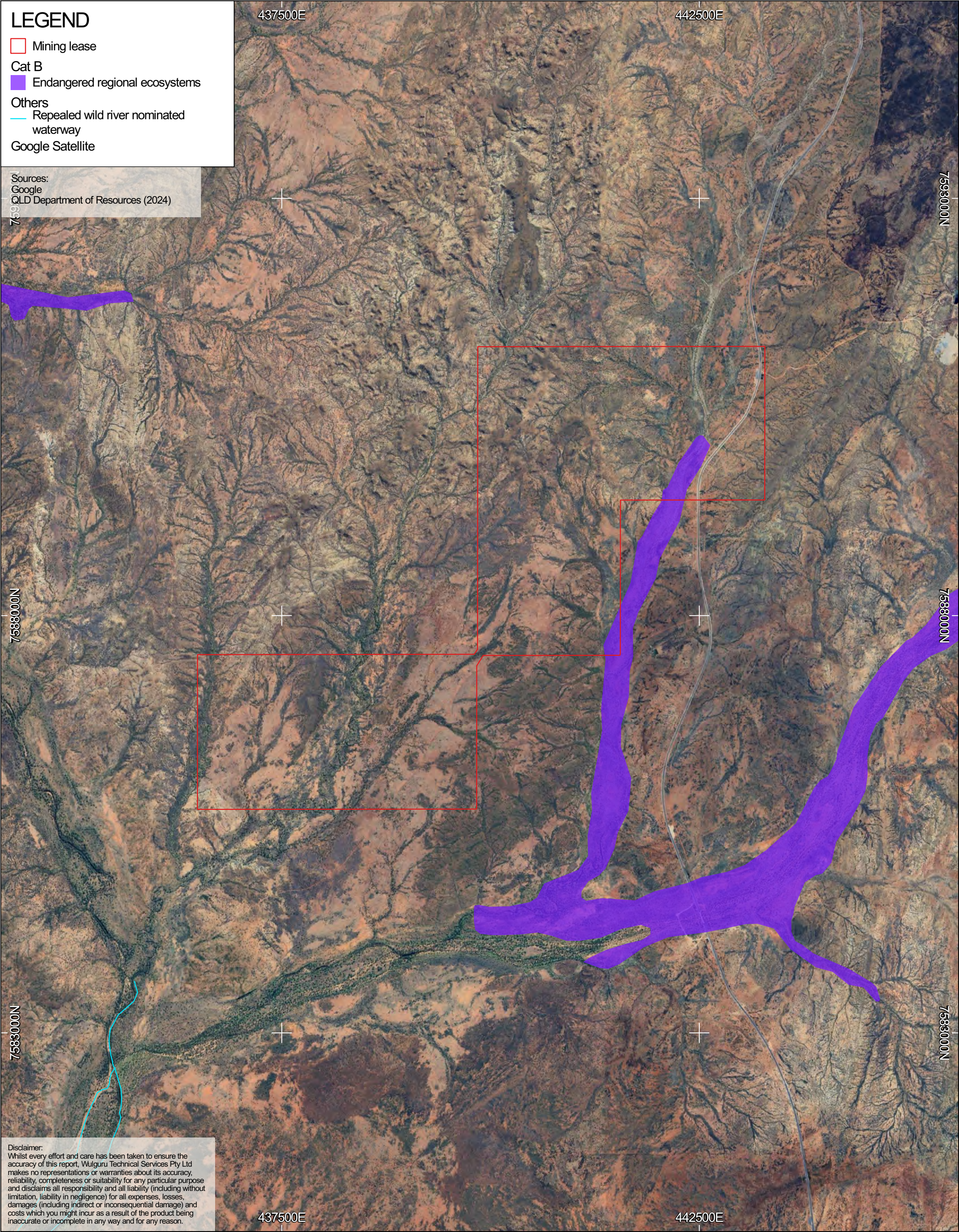
LC – Least concern. NC – No concern at present.

### 5.1.5. Environmentally Sensitive Areas

A single Environmentally Sensitive Area (ESA) is mapped throughout all MLs of the Chinova Osborne Project (Figure 19). The ESA is associated with RE 1.3.7a mapping within the south-eastern extent of the Lucky Luke Project (ML90187) which is classified as ‘endangered’ under the Queensland Biodiversity Status classification system. Operations at Lucky Luke are yet to commence and no increases to maximum authorised disturbance are proposed for authorised features to be established within this ML. Accordingly, no impacts are likely to occur to this ESA as a result of the proposed amendment.

No ESAs are located within or within proximity to the remaining MLs. Accordingly, it is unlikely that any of the Project disturbances (overclear and unauthorised feature disturbance) have resulted in an impact upon any ESA. Similarly, the disposal of water and dam liners within the Osborne pit is unlikely to impact an ESA.





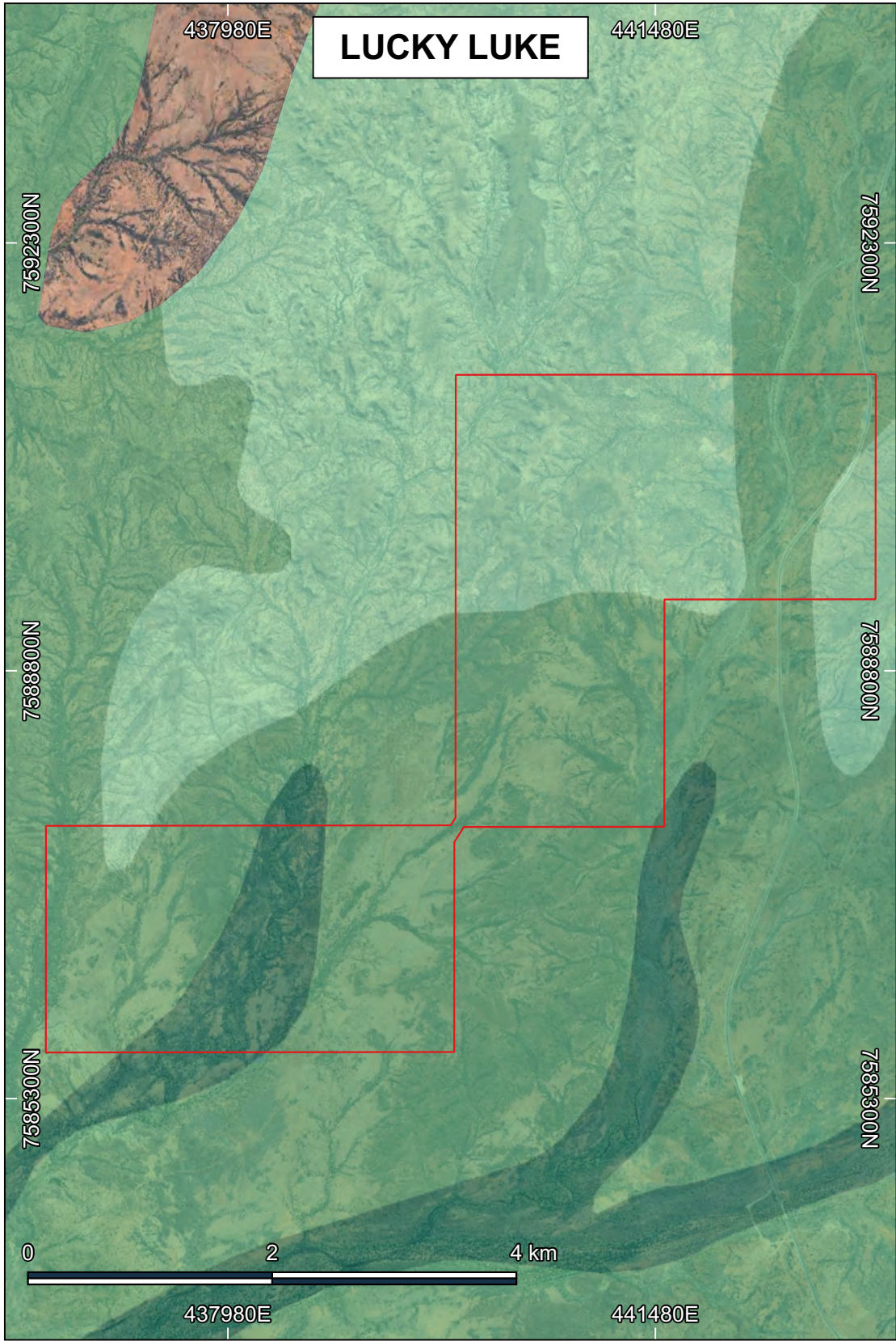
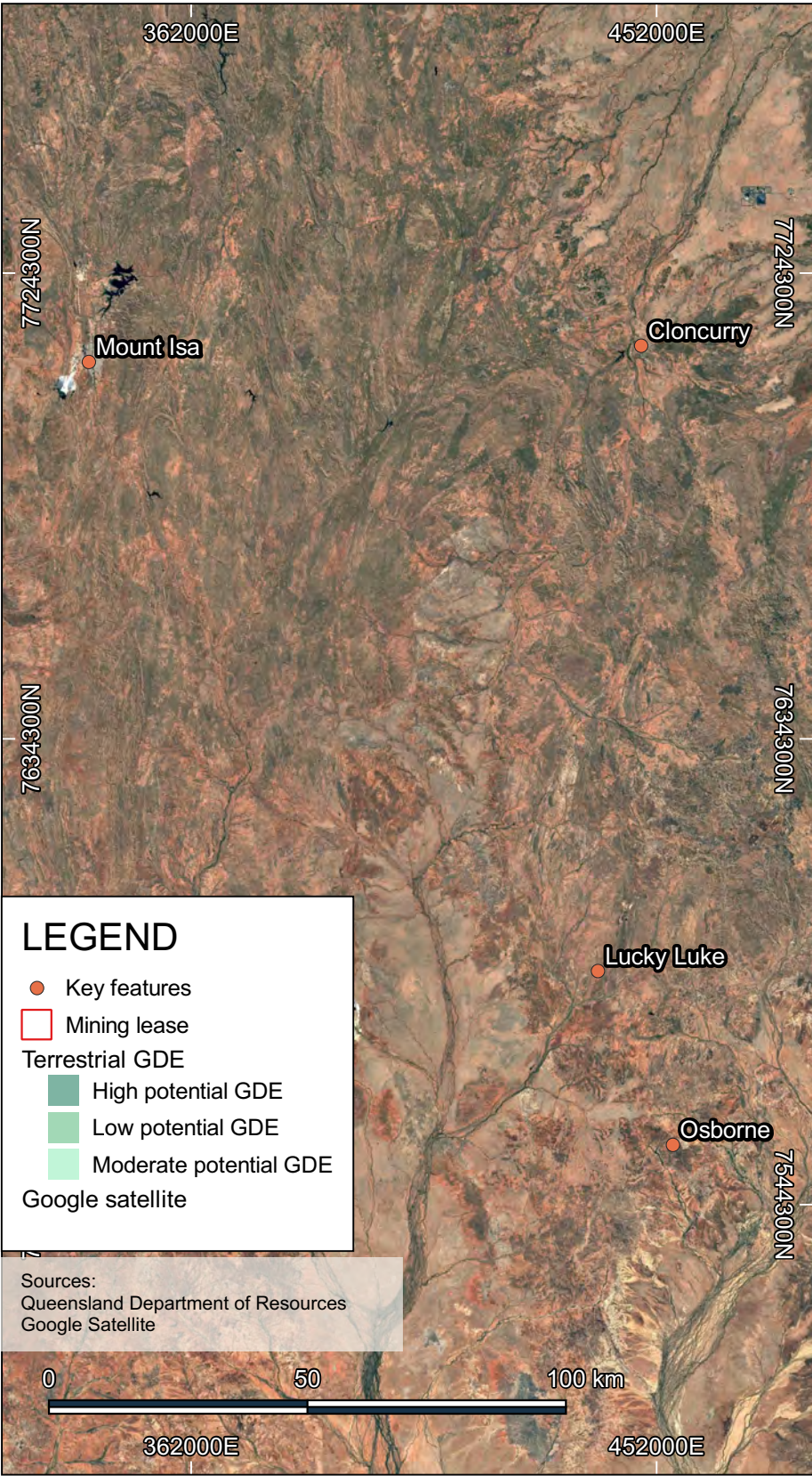


#### **5.1.6. Groundwater Dependent Ecosystems**

The terrestrial groundwater dependent ecosystem (GDE) mapping (Figure 20) indicates that the Project has potential to support GDEs; however, groundwater bores across the Project document that the depth of groundwater is typically greater than 20 mBGL, which is not considered accessible. There are no known aquatic nor subterranean GDEs within the Osborne Project area (AGE, 2023a; AGE, 2023b).


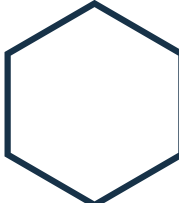
No impacts to GDEs are considered likely from overclear, existing unauthorised features, or the proposed disposal of water and dam liners within the pit.





EA AMENDMENT

FIGURE 20. TERRESTRIAL GROUNDWATER DEPENDENT ECOSYSTEMS

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			Author: H. Robb	
	Project Number: 2025.03007	Client: Chinova Resources Pty Ltd	Version: 0.01	



#### **5.1.7. Acid Sulfate Soils**

Acid Sulfate Soils (ASS) form in coastal areas lower than 5 mAHD. The Project is located above 5 mAHD and the risk of encountering ASS is considered negligible. No impacts relating to ASS are expected.

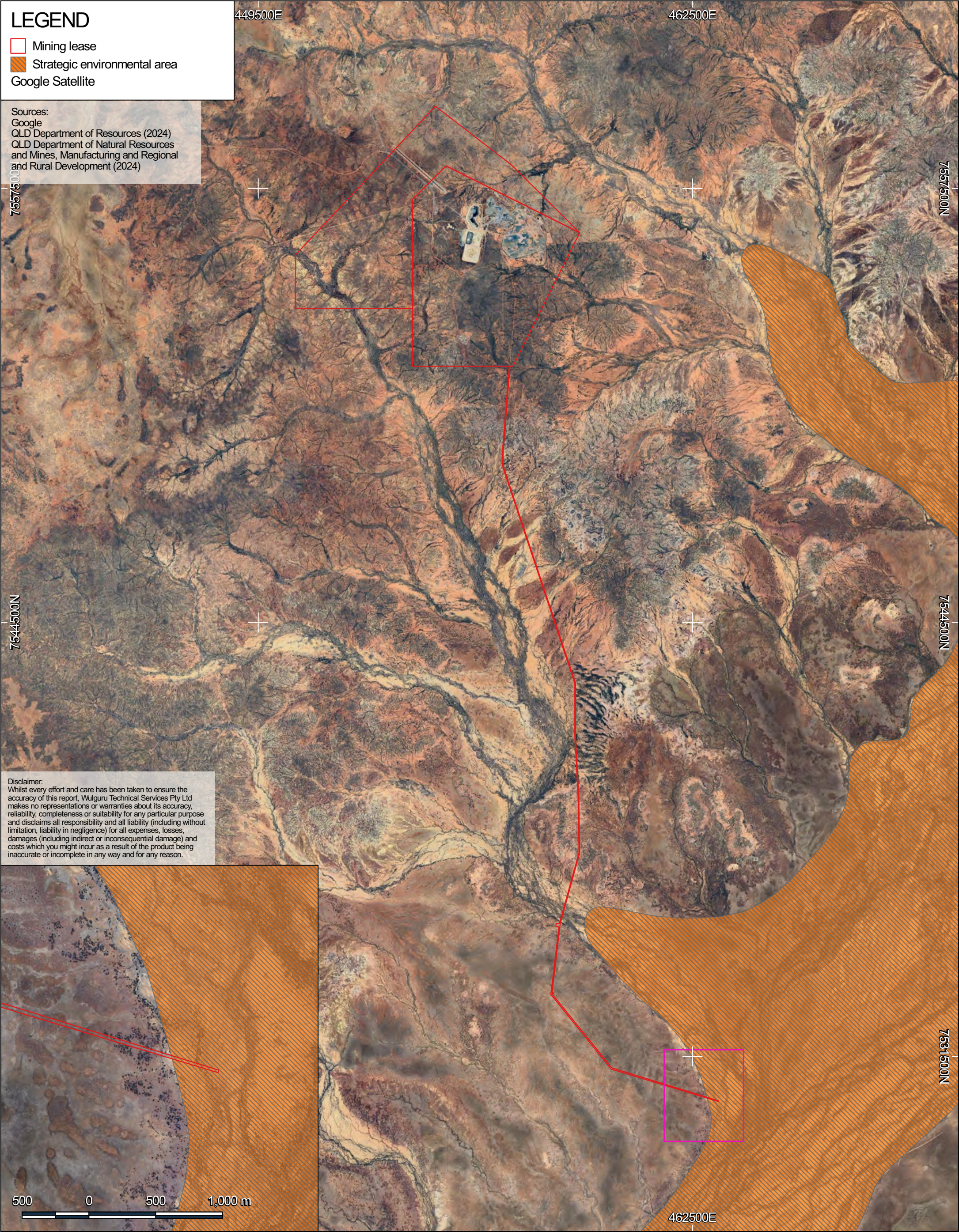
#### **5.1.8. Areas of Regional Interest**

Areas of regional interest are managed under the *Regional Planning Interests Act 2014*. The southern extent of ML90057 encroaches into Strategic Environmental Area mapping under the *Regional Planning Interests Act 2014* (Figure 21). This mapping is associated with the Hamilton River. Disturbance within ML90057 which encroaches into the Strategic Environmental Area mapping predates the *Regional Planning Interests Act 2014*.

All additional disturbance associated with unauthorised features and overclear for authorised features was located outside the Strategic Environmental Area mapping. The majority of disturbance is located within proximity to the main mining and processing area at Osborne, which is located 5 km from the nearest Strategic Environmental Area mapping to the east. The existing disturbance within the Strategic Environmental Area has not changed under this amendment. It is unlikely that the overclear for authorised features and the unauthorised features impacted the Strategic Environmental Area mapping.

The disposal of water and dam liners within the Osborne pit is unlikely to impact Strategic Environmental Area mapping. No additional disturbance is proposed as part of this amendment.







### 5.1.9. Waste Management

The reconciliation of authorised disturbances within Table A1 of the EA will increase maximum authorised disturbance for waste management features by 11.55 ha (3.1 %) across the entire Project. The change to authorised disturbances for each mine feature within the waste domain has been illustrated in Table 23.

**Table 23. Percent Change in Authorised Disturbance for Waste Mine Features**

Mine Feature Name	Current Authorised Disturbance Area (ha)	Proposed Authorised Disturbance (ha)	Area change (ha)	Percentage Change (%)
Osborne WRD	15.27	15.27	0	0
Osborne West WRD	13.71	13.71	0	0
Lucky Luke WRD	50.00	50.00	0	0
Osborne Pit and Extension	26.01	27.65	1.64	6.3
TSF1	56.15	56.15	0	0
TSF2	159.5	167.54	8.04	5
TSF3	39.13	39.13	0	0
Osborne Landfill/Laydown	8.72	10.59	1.87	21.4
Lucky Luke Landfill	0.61	0.61	0	0
Total	369.1	380.65	11.55	3.1

These features have and will continue to operate in accordance with the Waste Rock Management Plan, Waste Management Program, Waste Management Procedure, and Schedule E – Waste of the EA. Mining has ceased at all tenements within the Chinova Osborne Project; however, material from the Cloncurry Project (EA EPML00701913) continues to be processed at Osborne.

#### 5.1.9.1. Osborne Pit and Extension and TSF2

The Osborne Pit and Extension and TSF2 have been assessed in further detail as these were the only features to exceed the current authorised maximum disturbance footprint.

##### ***Osborne Pit and Extension***

The Osborne Pit and Extension is located within ML90040, positioned to the west of the processing area and north of TSF1. The Osborne Pit and Extension has a maximum authorised disturbance area of 26.01 ha; however, on-ground disturbance totals 27.65 ha. The pit is actively being used as a waste disposal location for tailings and mineralised waste.



No additional environmental impacts are likely to result from the authorisation of the Osborne Pit and Extension to 27.65 ha.

## ***TSF2***

TSF2 is located within ML90040, positioned to the east of the processing area and Osborne Pit and Extension. TSF2 is one of two regulated structures under the EA and has a maximum authorised disturbance area of 159.50 ha. This footprint includes the authorised disturbance footprint for both TSF2 and the TSF2 Reclaim Dam (21.65 ha).

On-ground disturbance for TSF2 (140.54 ha) and TSF2 Reclaim Dam (27.00 ha) totals 167.54 ha. No additional environmental impacts are likely to result from amending the maximum authorised disturbance footprint to 167.54 ha.

Further detail relating to the regulated structures has been provided within Section 5.1.11.

### **5.1.10. Unplanned and Uncontrolled Releases**

#### ***TSF2 East Environmental Dam***

The proposed amendment seeks the inclusion of the TSF2 East Environmental Dam within Table A1 of the EA. This structure contains runoff from a 36.26 ha catchment within the northern extent of TSF2. Contained runoff is evaporated within the structure. The amendment does not seek to authorise routine releases from this water storage.

The minimum capacity required for TSF2 East Environmental Dam to service the catchment has been modelled at 49.2 ML under a 1 % AEP 24-hour rain event (SLR, 2021a). Conservatively, the structure has been designed with a maximum capacity of 61.6 ML. Accordingly, TSF2 East Environmental Dam is highly unlikely (> 1%) to release.

If a release was anticipated from TSF2 East Environmental Dam, a temporary pump and generator will be used to pump water from TSF2 East Environmental Dam to the TSF2 Reclaim Dam, via the nearby TSF2 Reclaim Dam drain. The TSF2 Reclaim Dam has a capacity of 766 ML and has sufficient contingency to manage relocated water from TSF2 East Environmental Dam.

If an unauthorised release was to occur from TSF2 East Environmental Dam, water quality will be monitored by Chinova against contaminant levels identified in Table C2 of the EA. Additionally, the release will be managed under Chinova's Crisis and Emergency Management Procedure, with further response actions implemented in line with Conditions C2-1 to C2-5 of the EA.

As per Table 4, the TSF2 East Environmental Dam will be included in Table C11 (Onsite Water Storage Monitoring Locations). The water quality within this structure will be monitored on a quarterly basis against the contaminant limits detailed in Table C12 (Dam Water Quality Levels). Historic water quality data for this structure has been detailed within Section 5.2.4.

### ***Borrow Pits***

Borrow pits have historically been developed adjacent TSF2 and intermittently contain water as a result of surface runoff during rainfall events. Except for the borrow pit which contains TSF2 East Environmental Dam, borrow pits are not designed or intended to function as water storages, with contained runoff evaporated within each pit. No design information is available regarding the maximum storage capacity of these features.

The amendment does not seek to authorise routine releases from these features.

In the event that water in the borrow pit was anticipated to release, a temporary pump and generator will be used to transfer water to the nearby TSF2 East Environmental Dam. Should TSF2 East Environmental Dam approach maximum capacity, contingency measures are in place to transfer water to the TSF2 Reclaim Dam drain and ultimately to the TSF2 Reclaim Dam.

If an unauthorised release from the borrow pits does occur, Chinova will monitor the water quality in accordance with the contaminant limits as per Table C2 of the EA. Additionally, the release will be managed under Chinova's Crisis and Emergency Management Procedure, with further response actions implemented in line with Conditions C2-1 to C2-5 of the EA.

Chinova has opportunistically sampled the water quality from the borrow pits to the north of TSF2 between 2020 and 2023. The results of this historic water monitoring are provided within Section 5.2.4.

### ***Osborne Pit***

The Osborne pit is unlikely to release following the disposal of water and dam liners. The maximum authorised backfill level of the Osborne pit is RL 1243 m, with the crest of the pit at approximately RL 1268 m. The pit has capacity of 4.15 Mm<sup>3</sup> between RL 1245 m and RL 1268 m.

### ***Overclear and Unauthorised Features***

The remaining unauthorised features (i.e., administration office, magazine, and topsoil stockpiles) or reconciled overclear associated with authorised features are not expected to result in any unplanned or uncontrolled releases.

#### **5.1.11. Regulated Structures**

TSF1 and TSF2 (including TSF2 Reclaim Dam) are the only two regulated structures authorised under the EA. As per Section 5.1.9.1, reconciliation of historical disturbance has identified increased disturbance attributed with TSF2 and TSF2 Reclaim Dam, with on-ground disturbance now totalling 167.54 ha.

The increased disturbance area accurately reflects the true on-ground disturbance associated with this feature and is a result of disturbance creep, not a formal expansion. No change in dam height, storage volume, hazard classification, is proposed as part of this amendment. The structure will continue to be



managed in accordance with the existing environmental controls and monitoring requirements outlined in the EA and site management plans.

No additional disturbance has been attributed to TSF1. No changes are proposed to TSF1 as part of this amendment.

#### **5.1.12. Handling and Storage of Hazardous and Flammable Substances**

The proposed amendment seeks the formal authorisation of the magazine, located to the south of TSF2. There are no further changes proposed to any processing, maintenance or explosive storage areas.

The amendment does not propose to modify the Project's storage and handling procedures of hazardous materials. All chemicals will continue to be stored in accordance with *Australian Standard (AS) 1940 The storage and handling of combustible liquids*. As the proposed amendment is strictly administrative, no additional chemicals or fuel will be required onsite.

#### **5.1.13. Spill Management**

The proposed amendment will not introduce new chemicals to the Project. The current procedure for dealing with accidents, spills or incidents is detailed within the Chinova Waste Management Program, which details that all employees will be appropriately trained to contain and manage accidents, spills or incidents (Chinova, n.d.). All incidents are to be reported within 24 hours.

#### **5.1.14. Rehabilitation**

The amendment does not propose any changes to rehabilitation strategies or objectives in a way that increases environmental harm. All disturbed areas will be rehabilitated or restored to achieve sites that are:

- safe to humans and wildlife;
- non-polluting;
- stable;
- able to sustain an appropriate post mining land use;
- revegetated with species endemic to the area with no declared pest species; and
- compliant with all conditions of the EA.

Chinova developed a Progressive Rehabilitation and Closure Plan (PRCP) for the Osborne Project. Although the current submission was deemed 'not properly made' (NPM) by DETSI, post-mining land uses (PMLUs) were established by this PRCP for all project features in line with the Osborne Project Closure Plan. A revised PRCP will be submitted in response to the NPM decision.

Post-mining land uses (PMLUs) for the features seeking authorisation within this amendment are detailed in Table 24. The PMLUs are consistent with the surrounding areas.

**Table 24. Proposed PMLUs**

PMLU	Mine Feature
Low intensity grazing	Administration office
	Borrow pits
	Magazine
	Magazine topsoil stockpile
	Processing plant topsoil stockpile
Non-use management area (residual void)	Osborne Pit
Transfer to landholder (Chatsworth Station)	TSF2 East Environmental Dam

The Osborne pit will be retained as a void and established as a non-use management area (NUMA). The pit will be backfilled approximately to RL 1243 m. The additional disposal of water and dam liners within the Osborne pit will not prevent this NUMA from complying with Conditions F10-1 to F10-4 of the EA.

Overclear will be rehabilitated in accordance with the PMLUs identified by the PRCP for the relevant authorised features.



## 5.2. Water Impacts

In preparing this application, consideration has been given to guideline *ESR/2015/1837 – Application requirements for activities with impacts to water* (DETSI, 2024d). DETSI is required to assess the application against the requirements stated in the *Environmental Protection Act 1994*, EP Regulation and the EPP Water to meet the environmental objective and performance outcomes described below:

### Environmental Objective

‘The activity will be operated in a way that protects environmental values of waters.’

### Performance Outcome

There is no actual or potential discharge to waters of contaminants that may cause an adverse effect on an environmental value from the operation of the activity.

All of the following:

- The storage and handling of contaminants will include effective means of secondary containment to prevent or minimise releases to the environment from spillage or leaks.
- Contingency measures will prevent or minimise adverse effects on the environment due to the unplanned releases or discharges of contaminants to water.
- The activity will be managed so that stormwater contaminated by the activity that may cause an adverse effect on an environmental value will not leave the Project without prior treatment.
- The disturbance of any Acid Sulfate Soils, or potential Acid Sulfate Soils, will be managed to prevent or minimise adverse effects on environmental values.
- Acid producing rock will be managed to ensure that the production and release of acidic waste is prevented or minimised, including impacts during operation and after the environmental authority has been surrendered.
- Any discharge to water or a watercourse or wetland will be managed so that there will be no adverse effects due to the altering of existing flow regimes for water or a water course or wetland.
- For a petroleum activity, the activity will be managed in a way that is consistent with the coal seam gas water management policy, including the prioritisation hierarchy for managing and using coal seam gas water and the prioritisation hierarchy for managing saline waste.
- The activity will be managed so that adverse effects on environmental values are prevented or minimised.

### Environmental Objective

The activity will be operated in a way that protects the environmental values of groundwater and any associated surface ecological systems.

### Performance Outcome

Both of the following apply:

- There will be no direct or indirect release of contaminants to groundwater from the operation of the activity.
- There will be no actual or potential adverse effect on groundwater from the operation of the activity.

Or, the activity will be managed to prevent or minimise adverse effects on groundwater or any associated surface ecological systems.

Some activities involving direct releases to groundwater are prohibited by the EP Regulation.

#### **RISK OF ENVIRONMENTAL IMPACT: LOW**

##### **5.2.1. Overview of Water Impacts**

A retrospective impact assessment was undertaken for the reconciliation of on-ground disturbances (overclear) and inclusion of existing, unauthorised structures (e.g., borrow pits, TSF2 East Environmental Dam, administration office, magazine, and topsoil stockpiles). This assessment concluded that the reconciliation of on-ground disturbances and formal establishment of the existing, unauthorised structures, were unlikely to have resulted in significant impacts to water.

An impact assessment has been undertaken for the proposed disposal of water and dam liners, which concluded this amendment is unlikely to result in a significant impact to water.

Project activities will continue to be undertaken with existing management controls; no additional controls are required or proposed.

##### **5.2.2. Groundwater**

No additional disturbance or changes to operational processes are proposed at Lucky Luke and impacts to groundwater are considered unlikely.

As detailed within Section 4.5, limited groundwater occurs within the Osborne Project area. The limited groundwater occurring onsite is located within fractures in the Proterozoic units or in isolated pockets along the weathered contact (AGE, 2023a). It is understood that groundwater flow is limited in all directions, with flow velocities being extremely slow. Groundwater across the Osborne and Kulthor Project area is generally below 40 mBGL (AGE, 2023a).

##### ***TSF2 East Environmental Dam***

The TSF2 East Environmental Dam was established within the TSF2 Stockpile NE and has been in operation since the completion of the current TSF2 capping system in 2016. Chinova did not line TSF2 East Environmental Dam as there is limited potential for seepage to groundwater onsite. Additionally, the storage is situated within low permeability Mesozoic sediments (Rust PPK, 1994).



Groundwater quality and standing water levels are monitored on a quarterly basis as part of the existing groundwater monitoring program. No impacts to groundwater quality or quantity has been recorded in proximity to the TSF2 East Environmental Dam since its operation.

### ***Borrow Pits***

Borrow pits intermittently collect surface runoff during rainfall events. The pits are not lined; however, potential impacts to groundwater are considered unlikely due to the limited occurrence of groundwater at the site, and the short timeframes for which collected water remains within the pits following rainfall. Additionally, the pits are situated within the low permeability Mesozoic sediments (Rust PPK, 1994).

Quarterly monitoring for groundwater quality and standing level have not recorded impacts to groundwater in proximity to the borrow pits since their establishment. Accordingly, the presence of the borrow pits is unlikely to result in increased connectivity between surface water and the underlying groundwater system.

### ***Disposal of Water and Dam Liners within the Open Pit***

Tailings have been deposited within the Osborne underground workings surrounding and beneath the Osborne pit. PAF material, mineralized waste, construction/demolition waste, and general inert site clean-up materials are already approved for disposal within the pit. It is not expected that there would be any additional impact to groundwater as a result of disposal of water and dam liners within the open pit, provided the infill and decant water levels do not intersect the Mesozoic-Proterozoic contact between RL 1245 m and RL 1250 m. (SLR, 2022b)

### ***Overclear and Unauthorised Features***

Overclear associated with authorised features and the remaining unauthorised features (i.e., administration office, magazine, and topsoil stockpiles) are unlikely to have resulted in measurable impacts to groundwater quality or quantity. Any potential impacts from overclear are indistinguishable from those caused by the authorised features themselves.

Groundwater quality monitoring will continue to be undertaken in accordance with the EA. Further detail on groundwater monitoring has been provided within Section 5.2.10.

## **5.2.3. Surface Water**

Increased erosion may reduce surface water quality and increase sedimentation within onsite watercourses; however, Chinova has, and will continue to minimise these risks through best practice controls as detailed within Section 5.3.5 and the Erosion and Sediment Control Management Plan (Chinova, 2024). Existing, unauthorised features and overclear for authorised features have been operated in accordance with the site water management plan and Schedule C – Water of the EA.

Although specific monitoring efforts have not been undertaken to assess the impact had by TSF2 East Environmental Dam downstream, it is likely the establishment and operation of this structure has had a positive impact on surface waters as it contains and prevents the release of runoff from TSF2 entering

into the receiving environment of No Name Creek and Little Sandy Creek to the north. The presence of TSF2 East Environmental Dam reduces the potential for environmental harm caused by runoff and transport of contaminants.

No further impacts to surface water are considered likely to occur.

#### **5.2.4. Water Quality**

##### ***TSF2 East Environmental Dam***

Sampling data from TSF2 East Environmental Dam was analysed and assessed against the contaminant release limits of Table C2, as well as the onsite water storage contaminant limits in Table C12. The water quality was assessed against the contaminant release limits detailed in Table C2 as a precautionary measure, to identify potential impacts if an unauthorised release was to occur.

Analysis against the release water contaminant trigger levels and limits (Table C2), identified contaminant limit exceedances for pH, electrical conductivity (EC), dissolved cadmium, cobalt, copper, and total selenium (refer Table 25). Trigger level exceedances were identified for sulphate and dissolved selenium. Analysis against the onsite storage contaminant limits (Table C12) identified exceedances of pH, EC, and total aluminium, copper, cobalt, nickel, and selenium (refer Table 26).

The presence of contaminants within the TSF2 East Environmental Dam demonstrates the dam's functional purpose: to capture and contain potentially contaminated runoff from TSF2. This containment prevents the uncontrolled release of contaminants into the surrounding environment. In the absence of this structure, there would be an increased risk of contaminated water discharging into receiving ecosystems.

The contaminant limits defined in Table C12 originate from the ANZECC (2000) stock drinking water quality guidelines. The location of this storage within the operational footprint of the Osborne Project area restricts cattle access. The storage is not accessible to cattle for drinking. TSF2 East Environmental Dam does not present a risk to cattle.

As described above, the potential for release of water from the TSF2 East Environmental Dam is low and contingency measures are available to prevent releases. Additionally, potential impacts on groundwater are considered unlikely.

##### ***Borrow Pits***

Water quality data from the borrow pits was analysed and assessed against the contaminant release limits of Table C2 (refer Table 27 to Table 29). Borrow pit water quality is sampled at three locations, TSF2 – N1, TSF2 – N2, and TSF2 – N3. No water quality samples have been collected for the borrow pit immediately east of TSF2 (i.e., located within the previous footprint for TSF2 Stockpile E).

Analysis identified contaminant limit exceedances for pH and dissolved cobalt and copper at TSF2 – N1, and pH at TSF2 – N2 and TSF2 – N3. Trigger level exceedances were identified for EC at all three sample locations.



The borrow pits are not accessible to cattle for drinking, therefore do not present a risk to cattle.

As described above, the potential for release of water from the borrow pits is low and contingency measures are available to prevent releases. Additionally, potential impacts on groundwater are considered unlikely.

#### ***Disposal of Water and Dam Liners within the Open Pit***

Prior to the ongoing deposition of tailings within the Osborne Pit, no standing water body was present in the pit throughout mining operations. Currently, water is present within the pit and is actively pumped to the mill for reuse in processing operations. Pit water quality has not been sampled.

The water quality for Environment Dams 2/3 and 4, Kulthor Turkey's Nest, and TSF2 Reclaim Dam have been detailed within Table 30 to Table 33. Water quality has not been analysed for the Process Water Pond or Workshop Ponds. Water quality at Environment Dam 2/3 and 4, Kulthor Turkey's Nest, and TSF2 Reclaim Dam, were assessed against the onsite water storage contaminant limits as detailed within Table C12. Exceedances of the contaminant limits were recorded at all water storages.

Void hydrology modelling undertaken by AGE determined that the pit acts as a groundwater sink and for all but the most extreme rainfall years (1 % AEP scenario), the pit water budget will be negative; this implies that there will be no pit lake under typical or even wet conditions following the backfilling of the pit (AGE, 2023a). As previously detailed, the disposed 84.6 ML of disposed water within the pit will take approximately 5.2 months to evaporate.

As there will be no standing pit lake following the backfilling of the pit, the disposal of water and dam liners will not impact water quality within the pit. The deposited PAF material and mineralized waste already deposited within the pit means it is unlikely that the disposal of water from the water storages (Environment Dam 2/3 and 4, Kulthor Turkey's Nest, TSF2 Reclaim Dam, Process Water Pond, and Workshop Ponds) would reduce water quality within the pit.

#### ***Overclear and Unauthorised Features***

Impacts to water quality resulting from overclear and the balance of existing, unauthorised features (i.e., administration offices, topsoil stockpiles, and magazine), are negligible and indiscernible from existing authorised feature disturbance.

**Table 25. TSF2 East Environmental Dam Water Quality Data – Release Water Contaminant Trigger Levels and Limits – Table C2**

Analyte	pH	EC	Sulphate as SO <sub>4</sub> <sup>2-</sup> - mg/L	Suspended Solids	Aluminium (Dissolved)	Arsenic (Dissolved)	Cadmium (Dissolved)	Cobalt (Dissolved)	Copper (Dissolved)	Selenium (Dissolved)	Selenium (Total)	Hardness (CaCO <sub>3</sub> )
Units	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EA Trigger Level	6 – 7.5	435	80 <sup>th</sup> percentile of reference	For interpretation purposes only.	For interpretation purposes. Results to be included in any investigation of an exceedance of the trigger levels for pH in accordance with condition C5-2.	80 <sup>th</sup> percentile of reference or 0.013	80 <sup>th</sup> percentile of reference or 0.0002	0.0014 <sup>1</sup>	80 <sup>th</sup> percentile of reference or 0.0014	80 <sup>th</sup> percentile of reference or 0.011 (Dissolved)	-	For interpretation purposes only.
EA Contaminant Limit	6.0 – 9.0	1000	1000			0.14	0.0008	0.09	0.03	-	0.02 (Total)	
Little Sandy Creek Upstream 1 (Reference Site)	-	-	80 <sup>th</sup> Percentile – 3.44	-	-	Insufficient detects to calculate 80 <sup>th</sup> percentile			80 <sup>th</sup> – 0.003	Insufficient detects to calculate 80 <sup>th</sup> percentile	-	-
Number of samples	16	7	1	10	12	12	12	12	12	12	16	9
Number of results above limit of reporting	16	7	1	10	11	1	2	9	12	5	9	9
Minimum Detect	4	74	613	10	0.006	0.001	0.0003	0.001	0.008	0.002	0.002	16
Maximum Detect	8.01	5200	613	2000	12	0.001	0.0013	5	35	0.015	0.038	2000
Median	6.95	1805	-	18.5	1.06	-	-	0.019	0.0185	0.00175	0.003	550
80th Percentile	7.5	2900	-	24.2	4.8	-	-	0.059	0.0284	0.0098	0.011	1116
95th Percentile	8.025	4225	-	76.4	17.75	-	-	2.855	18.005	0.0128	0.023	1800

As processing of ore from the Merlin underground has not commenced, analysis of lead, molybdenum, nickel, rhenium, and zinc is not required. Monitoring of fluoride, phosphate, and nitrogen is not required as not a location defined in Table C4.

Exceedances of contaminant trigger level has been highlighted in yellow; exceedance of contaminant limit has been highlighted in red.



Table 26. TSF2 East Environmental Dam Water Quality Data – Dam Water Quality – Table C12

Analytes	pH	Electrical Conductivity	Turbidity	Sulphate as SO4	Aluminium	Arsenic	Cadmium	Copper	Cobalt	Nickel	Selenium
Units	pH units	µS/cm	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EA Dam Water Quality Levels	5.0 (Min.)	1500	Twice the Reference Value - 78 <sup>1</sup>	1000	5	0.5	0.01	1	1	1	0.02
	9.0 (Max.)										
Number of samples	16	16	5	1	16	16	16	16	16	16	16
Number of results above limit of reporting	16	16	5	1	16	2	4	16	16	16	9
Minimum Detect	4	74	1.3	613	0.03	0.001	0.0003	0.002	0.002	0.002	0.002
Maximum Detect	8.01	5200	11	613	32	0.007	0.0013	71	12	1.7	0.038
Median	6.95	1805	1.8	-	1.06	0.0015	0.00005	19	0.061	0.0105	0.003
80th Percentile	7.5	2900	8.44	-	4.8	0.0015	0.0001	0.8	0.11	0.041	0.011
95th Percentile	8.0025	4225	10.36	-	17.75	0.002875	0.0015	44	6.825	0.9725	0.023

Contaminant Limit values for metals are measured as totals. As processing of ore from Merlin has not commenced, monitoring for lead, molybdenum, rhenium, and zinc has not been included.

Exceedances of the EA Dam Water Quality Levels (Table C12) have been highlighted in yellow.

<sup>1</sup>Reference value for turbidity derived from Sandy Creek Upstream reference site.

**Table 27. Borrow Pit TSF2 - N1 Water Quality Data – Release Water Contaminant Trigger Levels and Limits – Table C2**

Analyte	pH	EC	Sulphate as SO <sub>4</sub> <sup>2-</sup> - mg/L	Suspended Solids	Aluminium (Dissolved)	Arsenic (Dissolved)	Cadmium (Dissolved)	Cobalt (Dissolved)	Copper (Dissolved)	Selenium (Dissolved)	Selenium (Total)	Hardness (CaCO <sub>3</sub> )
Units	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EA Trigger Level	6 – 7.5	435	80 <sup>th</sup> percentile of reference	For interpretation purposes only.	For interpretation purposes. Results to be included in any investigation of an exceedance of the trigger levels for pH in accordance with condition C5-2.	80 <sup>th</sup> percentile of reference or 0.013	80 <sup>th</sup> percentile of reference or 0.0002	0.0014 <sup>1</sup>	80 <sup>th</sup> percentile of reference or 0.0014	80 <sup>th</sup> percentile of reference or 0.011 (Dissolved)	-	For interpretation purposes only.
EA Contaminant Limit	6.0 – 9.0	1000	1000			0.14	0.0008	0.09	0.03	-	0.02 (Total)	
Little Sandy Creek Upstream 1 (Reference Site)	-	-	Insufficient detects to calculate 80 <sup>th</sup> percentile	-	-	Insufficient detects to calculate 80 <sup>th</sup> percentile					-	-
Number of samples	5	6	4	2	3	3	3	4	4	3	4	2
Number of results above limit of reporting	5	6	4	2	3	0	0	4	4	0	0	2
Minimum Detect	5.9	130	40	55	0.12	-	-	0.023	0.084	-	-	37
Maximum Detect	7.7	520	150	170	1	-	-	0.27	0.7	-	-	72
Median	6.6	250	82	112.5	0.23	-	-	0.0895	0.19	-	-	54.5
80th Percentile	7.46	410	109.8	147	0.692	-	-	0.0812	0.106	-	-	65
95th Percentile	7.64	492.5	139.95	164.25	0.923	-	-	0.1028	0.109	-	-	70.25

As processing of ore from the Merlin underground has not commenced, analysis of lead, molybdenum, nickel, rhenium, and zinc is not required. Monitoring of fluoride, phosphate, and nitrogen is not required as this location is not listed in Table C4.

Exceedances of contaminant trigger level have been highlighted in yellow; exceedance of contaminant limits have been highlighted in red.



**Table 28. Borrow Pit TSF2 - N2 Water Quality Data – Release Water Contaminant Trigger Levels and Limits – Table C2**

Analyte	pH	EC	Sulphate as SO <sub>4</sub> <sup>2-</sup> - mg/L	Suspended Solids	Aluminium (Dissolved)	Arsenic (Dissolved)	Cadmium (Dissolved)	Cobalt (Dissolved)	Copper (Dissolved)	Selenium (Dissolved)	Selenium (Total)	Hardness (CaCO <sub>3</sub> )
Units	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EA Trigger Level	6 – 7.5	435	80 <sup>th</sup> percentile of reference	For interpretation purposes only.	For interpretation purposes. Results to be included in any investigation of an exceedance of the trigger levels for pH in accordance with condition C5-2.	80 <sup>th</sup> percentile of reference or 0.013	80 <sup>th</sup> percentile of reference or 0.0002	0.0014 <sup>1</sup>	80 <sup>th</sup> percentile of reference or 0.0014	80 <sup>th</sup> percentile of reference or 0.011 (Dissolved)	-	For interpretation purposes only.
EA Contaminant Limit	6.0 – 9.0	1000	1000			0.14	0.0008	0.09	0.03	-	0.02 (Total)	
Little Sandy Creek Upstream 1 (Reference Site)	-	-	Insufficient detects to calculate 80 <sup>th</sup> percentile	-	-	Insufficient detects to calculate 80 <sup>th</sup> percentile					-	-
Number of samples	2	3	1	0	0	0	0	0	0	0	0	0
Number of results above limit of reporting	2	3	1	0	0	0	0	0	0	0	0	0
Minimum Detect	5.2	100	300	-	-	-	-	-	-	-	-	-
Maximum Detect	8.4	750	300	-	-	-	-	-	-	-	-	-
Median	6.8	160	-	-	-	-	-	-	-	-	-	-
80th Percentile	7.76	514	-	-	-	-	-	-	-	-	-	-
95th Percentile	8.24	691	-	-	-	-	-	-	-	-	-	-

As processing of ore from the Merlin underground has not commenced, analysis of lead, molybdenum, nickel, rhenium, and zinc is not required. Monitoring of fluoride, phosphate, and nitrogen is not required as this location is listed in Table C4.

Exceedances of contaminant trigger level have been highlighted in yellow; exceedance of contaminant limits have been highlighted in red.

**Table 29. Borrow Pit TSF2 - N3 Water Quality Data – Release Water Contaminant Trigger Levels and Limits – Table C2**

Analyte	pH	EC	Sulphate as SO <sub>4</sub> <sup>2-</sup> - mg/L	Suspended Solids	Aluminium (Dissolved)	Arsenic (Dissolved)	Cadmium (Dissolved)	Cobalt (Dissolved)	Copper (Dissolved)	Selenium (Dissolved)	Selenium (Total)	Hardness (CaCO <sub>3</sub> )
Units	pH units	µS/cm	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EA Trigger Level	6 – 7.5	435	80 <sup>th</sup> percentile of reference	For interpretation purposes only.	For interpretation purposes. Results to be included in any investigation of an exceedance of the trigger levels for pH in accordance with condition C5-2.	80 <sup>th</sup> percentile of reference or 0.013	80 <sup>th</sup> percentile of reference or 0.0002	0.0014 <sup>1</sup>	80 <sup>th</sup> percentile of reference or 0.0014	80 <sup>th</sup> percentile of reference or 0.011 (Dissolved)	-	For interpretation purposes only.
EA Contaminant Limit	6.0 – 9.0	1000	1000			0.14	0.0008	0.09	0.03	-	0.02 (Total)	
Little Sandy Creek Upstream 1 (Reference Site)	-	-	Insufficient detects to calculate 80 <sup>th</sup> percentile	-	-	Insufficient detects to calculate 80 <sup>th</sup> percentile					-	-
Number of samples	2	3	1	0	0	0	0	0	0	0	0	0
Number of results above limit of reporting	2	3	1	0	0	0	0	0	0	0	0	0
Minimum Detect	5.1	100	160	-	-	-	-	-	-	-	-	-
Maximum Detect	8.8	510	160	-	-	-	-	-	-	-	-	-
Median	6.95	210	-	-	-	-	-	-	-	-	-	-
80th Percentile	8.06	390	-	-	-	-	-	-	-	-	-	-
95th Percentile	8.615	480	-	-	-	-	-	-	-	-	-	-

As processing of ore from the Merlin underground has not commenced, analysis of lead, molybdenum, nickel, rhenium, and zinc is not required. Monitoring of fluoride, phosphate, and nitrogen is not required as this location is not listed in Table C4.

Exceedances of contaminant trigger level have been highlighted in yellow; exceedance of contaminant limits have been highlighted in red.



**Table 30. Environment Dam 2/3 Water Quality Data – Dam Water Quality – Table C12**

Analytes	pH	Electrical Conductivity	Turbidity	Sulphate as SO <sub>4</sub>	Aluminium	Arsenic	Cadmium	Copper	Cobalt	Nickel	Selenium
Units	pH units	µS/cm	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EA Dam Water Quality Levels	5.0 (Min.)	1500	Twice the Reference Value - 78 <sup>1</sup>	1000	5	0.5	0.01	1	1	1	0.02
	9.0 (Max.)										
Number of samples	23	23	12	1	23	23	23	23	23	23	23
Number of results above limit of reporting	23	23	12	1	23	2	14	23	23	23	18
Minimum Detect	4.6	240	1.2	860	0.025	0.001	0.0001	0.15	0.013	0.007	0.004
Maximum Detect	8	5,700	250	860	16	0.005	0.0022	58	10	1.2	0.04
Median	6.53	1,600	14	-	0.77	-	0.0002	2.4	0.4	0.062	0.01
80th Percentile	7.62	2,544	64.4	-	2.9	-	0.0007	12.32	3.004	0.348	0.0206
95th Percentile	7.79	3,350	206	-	9.35	-	0.00136	32.1	5.97	0.714	0.0297

Contaminant Limit values for metals are measured as totals. As processing of ore from Merlin has not commenced, monitoring for lead, molybdenum, rhenium, and zinc has not been included.

Exceedances of the EA Dam Water Quality Levels (Table C12) have been highlighted in yellow.

<sup>1</sup>Reference value for turbidity derived from Sandy Creek Upstream reference site.

**Table 31. Environment Dam 4 Water Quality Data – Dam Water Quality – Table C12**

Analytes	pH	Electrical Conductivity	Turbidity	Sulphate as SO <sub>4</sub>	Aluminium	Arsenic	Cadmium	Copper	Cobalt	Nickel	Selenium
Units	pH units	µS/cm	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EA Dam Water Quality Levels	5.0 (Min.)	1500	Twice the Reference Value - 78 <sup>1</sup>	1000	5	0.5	0.01	1	1	1	0.02
	9.0 (Max.)										
Number of samples	10	10	6	8	10	10	10	10	10	10	10
Number of results above limit of reporting	10	10	6	8	10	1	10	10	10	10	8
Minimum Detect	5.12	740	1	270	0.072	0.002	0.0002	10	0.66	0.1	4
Maximum Detect	6.5	4,420	54	1,300	1.29	0.002	0.0026	143	4.96	0.901	0.03
Median	5.6	1,860	4.15	635	0.22	0.0015	0.00065	26	1.2	0.19	0.0115
80th Percentile	5.8	2,920	12	1,064	0.338	0.0015	0.0009	47.46	1.702	0.3164	0.0214
95th Percentile	6.185	3,781	43.5	1,265	1.002	0.001775	0.001835	100.835	3.4975	0.65305	0.02685

Contaminant Limit values for metals are measured as totals. As processing of ore from Merlin has not commenced, monitoring for lead, molybdenum, rhenium, and zinc has not been included.

Exceedances of the EA Dam Water Quality Levels (Table C12) have been highlighted in yellow.

<sup>1</sup>Reference value for turbidity derived from Sandy Creek Upstream reference site.



Table 32. Kulthor Turkey's Nest Water Quality Data – Dam Water Quality – Table C12

Analytes	pH	Electrical Conductivity	Turbidity	Sulphate as SO4	Aluminium	Arsenic	Cadmium	Copper	Cobalt	Nickel	Selenium
Units	pH units	µS/cm	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EA Dam Water Quality Levels	5.0 (Min.)	1500	Twice the Reference Value - 78 <sup>1</sup>	1000	5	0.5	0.01	1	1	1	0.02
	9.0 (Max.)										
Number of samples	2	2	-	2	2	2	2	2	2	2	2
Number of results above limit of reporting	2	2	-	2	2	1	1	2	2	2	2
Minimum Detect	7.7	2,800	-	1,200	0.025	0.019	0.0007	0.005	0.035	0.009	0.005
Maximum Detect	8.1	10,000	-	2,300	8.7	0.019	0.0007	2.2	0.045	0.075	0.008
Median	7.9	6,400	-	1,750	4.3625	-	-	1.1025	0.04	0.042	0.0065
80th Percentile	-	-	-	-	-	-	-	-	-	-	-
95th Percentile	-	-	-	-	-	-	-	-	-	-	-

Contaminant Limit values for metals are measured as totals. As processing of ore from Merlin has not commenced, monitoring for lead, molybdenum, rhenium, and zinc has not been included. Turbidity was not monitored.

Exceedances of the EA Dam Water Quality Levels (Table C12) have been highlighted in yellow.

<sup>1</sup>Reference value for turbidity derived from Sandy Creek Upstream reference site.

**Table 33. TSF2 Reclaim Dam Water Quality Data – Dam Water Quality – Table C12**

Analytes	pH	Electrical Conductivity	Turbidity	Sulphate as SO <sub>4</sub>	Aluminium	Arsenic	Cadmium	Copper	Cobalt	Nickel	Selenium
Units	pH units	µS/cm	NTU	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
EA Dam Water Quality Levels	5.0 (Min.)	1500	Twice the Reference Value - 78 <sup>1</sup>	1000	5	0.5	0.01	1	1	1	0.02
	9.0 (Max.)										
Number of samples	45	38	19	1	38	38	38	38	38	38	38
Number of results above limit of reporting	45	38	19	1	38	3	20	37	37	37	31
Minimum Detect	3.5	1,160	0.9	1,500	0.02	0.002	0.0001	0.003	0.003	0.007	0.007
Maximum Detect	8.3	37,000	130	1,500	7.2	0.017	0.0011	28	5.6	0.63	0.13
Median	6.4	9,900	3.2	-	0.14	-	0.00025	0.22	0.98	0.16	0.0295
80th Percentile	7.72	16,600	7.48	-	0.916	-	0.0007	2.68	2.26	0.384	0.050
95th Percentile	8	22,600	27.4	-	3.205	-	0.00131	18.15	4.72	0.546	0.0661

Contaminant Limit values for metals are measured as totals. As processing of ore from Merlin has not commenced, monitoring for lead, molybdenum, rhenium, and zinc has not been included.

Exceedances of the EA Dam Water Quality Levels (Table C12) have been highlighted in yellow.

<sup>1</sup>Reference value for turbidity derived from Sandy Creek Upstream reference site.



### 5.2.5. Erosion and Sediment Control

Additional disturbance sitewide may lead to the increase occurrence of erosion as detailed within the Risk Assessment (refer Section 6.4). Notably, 131.41 ha of overclear was identified for the Osborne Roads and Tracks features authorised under the EA. Overclear for this feature predominantly consists of exposed soil surfaces which are susceptible to erosion.

The Erosion and Sediment Control (ESC) Management Plan describes a risk-based approach and strategies implemented by Chinova to control erosion and sediment risks (Chinova, 2024). Control measures described and recommended within the ESC management plan include:

- Drainage controls
  - Short-term design drainage standard
  - Flow diversion around soil disturbances and stockpiles
  - Drainage for unsealed roads
  - Crowning drainage
  - Cross slope drainage
  - Table drains
  - Mitre drains
  - Whoa boys (cross banks)
  - Waterway crossing controls
- Erosion controls
  - Erosion control design standard
  - Land clearing
  - Rehabilitation
  - Erosion controls
- Sediment controls
  - Sediment control design standard
  - Sediment controls (sheet and concentrated flow treatment techniques)
  - Sediment basins
- Water releases
  - Water quality release criteria
  - Flocculants and coagulants

Maintenance and monitoring measures for the abovementioned ESC measures include:

- Maintenance:
  - All drainage, erosion and sediment control measures will be maintained until their function is no longer required and adequate surface stabilisation is achieved.
  - All water, debris, and sediment removed from control measures will be disposed of or re-used in a manner that will not create an erosion or pollution hazard.
  - Sediment traps are to be maintained once capacity drops below 75 %.
  - Indicators of maintenance condition that may trigger remedial works include:

- Flattening out or crossfall
- Rill and or scouring of the road surface
- Build-up of sediment or blockage of table and mitre drains
- Windrows preventing outfall drainage or blocking the entrance to drainage structures
- Build-up of sediment and or debris in rollover channels, culverts and headwalls
- Discharge surfaces no longer stable
- Deposition of road-base sediment in watercourse
- Monitoring:
  - Surface water and Receiving Environment Monitoring Programs
  - Pre-wet season inspections are undertaken annual, the scope of which includes:
    - Inspection of the integrity of the water management network
    - Verify adequate freeboard is available in sediment dams
    - Inspect silt/sediment build up in drainage lines dams
    - Inspect the integrity of the spillways
    - Inspect the integrity of the diversion drains

#### **5.2.6. Acid Sulfate Soils**

Acid Sulfate Soils have been addressed within Section 5.2.6.

#### **5.2.7. Acid Producing Rock**

The proposed amendment does not include the construction of any additional mineral or non-mineral waste management features. The reconciliation of authorised disturbances with Table A1 of the EA will increase maximum authorised disturbance for waste management features by 3.1 % across the entire Project.

These features have been and will continue to be operated in accordance with the site waste management plan and Schedule E – Waste of the EA. No changes are proposed to the storage of acid producing rock and management of produced acidic waste.

Further details relating to waste management are provided within 5.2.9 and 5.4.

#### **5.2.8. Discharges and Releases**

As detailed within Section 5.1.10, this EA amendment does not seek to authorise further releases.

No release point is proposed as part of the TSF2 East Environmental Dam. A hazardous dam consequence category assessment (CCA) has been undertaken for TSF2 East Environmental Dam (SLR, 2021a). Based on the surface runoff capacity being significantly less than the available pit volume, all of which is below natural grade, and limited downstream groundwater and surface water uses, the structure was determined to be a low consequence structure.



The disposal of water and dam liners within the Osborne pit is unlikely to result in a release from this feature. The maximum authorised backfill level of the Osborne pit is RL 1243 m, with the crest of the pit at approximately RL 1268 m. The pit has capacity of 4.15 Mm<sup>3</sup> between RL 1245 m and RL 1268 m. Accordingly, overtopping or releases from this feature are considered highly unlikely.

There is significant contingency within the Osborne water balance model to relocate water to prevent the occurrence of a release.

Any unauthorised releases will be monitored for quality characteristics specified in Table E3 of the EA. The authority holder will additionally undertake measures described within Conditions E32 – E34 of the EA.

As per Section 2.2, the TSF2 East Environmental dam will be included in Table C11 (Onsite Water Storage Monitoring Locations) and will be monitored on a quarterly basis against the contaminants detailed in Table C12 (Dam Water Quality Levels).

#### **5.2.9. Handling and Storage of Hazardous Materials**

Refer to Section 5.1.11.

#### **5.2.10. Monitoring of Water Impacts**

The proposed amendment will not introduce any new contaminants of concern or increase current observed concentrations of potential contaminants.

Chinova have previously included an observation bore (“new bore”) within the groundwater monitoring network to monitor potential groundwater impacts resulting from the backfilling of the Osborne pit. The observation bore is located to the south-west of the pit and targets the Mesozoic-Proterozoic contact between RL 1245 m and RL 1250 m. The bore has remained dry since installation. It can be inferred that any water detected in future at this monitoring bore, following the backfilling of the pit, is directly as a result of backfilling the pit.

Additional water storage monitoring locations have been proposed alongside the formalisation of the TSF2 East Environmental Dam. These monitoring locations have been detailed within Table 4 and are to be included within Table C11.

Water quality will continue to be monitored for contaminants of concern in accordance with the EA. Any exceedances will be investigated, and corrective action implemented as required.

## 5.3. Waste Impacts

In preparing this report, consideration has been given to guideline *ESR/2015/1836 - Application requirements for activities with waste impacts* (DETSI, 2024f). DETSI is required to assess the application against the requirements stated in the *Environmental Protection Act 1994*, the *Environmental Protection Regulation 2019* (EP Regulation) and the *Waste Reduction and Recycling Act 2011* to meet the environmental objective and performance outcomes described below:

### Environmental Objective

‘Any waste generated, transported, or received as part of carrying out the activities is managed in a way that protects all environmental values’.

### Performance Outcome

- Waste generated, transported, or received, is managed in accordance with the waste and resource management hierarchy in the *Waste Reduction and Recycling Act 2011*; and
- If waste is disposed of, it is disposed of in a way that prevents or minimises adverse effects on environmental values.

**RISK OF ENVIRONMENTAL IMPACT: LOW**

### 5.3.1. Overview of Waste Impacts

In preparing supporting information relating to waste impacts, due consideration has been given to the waste and resource management hierarchy (Figure 22). Measures proposed for the minimisation and management of waste have been considered in line with this hierarchy with disposal considered to be the final option.

The amendment does not propose any change to waste generation or storage; however, it does propose changes to the disposal of dam liners. The waste hierarchy has been applied in determining the most appropriate management strategy for the Kulthor Turkey’s Nest and Process Water Pond dam liners at closure. Recycling of the liners has been assessed as unviable due to the potential for residual contamination and absence of a suitable or certified recycling pathway.

An impact assessment was undertaken which concluded the proposed change in disposal method for the dam liners is unlikely to result in any significant waste-related impacts.

The reconciliation of authorised maximum disturbance for all features within Table A1 of the EA will authorise an 9.68 ha increase in mine features under the waste domain. A retrospective impact assessment was undertaken on the increase in authorised disturbance for waste domain mine features, which concluded that the proposed amendment is unlikely to have resulted in significant waste impacts.

Project activities will continue to be undertaken with existing management controls; no additional controls are required or proposed.





**Figure 22. Waste and Resource Management Hierarchy**

### **5.3.2. Management of Waste Impacts**

Management of waste is discussed in Section 5.2.9.

Waste storage features have, and will continue to operate under the requirements of the site waste management plan and Schedule E – Waste of the EA. Further, the overclear for waste features has not encroached into any areas of environmental significance and accordingly, no impacts are likely to result from the authorisation of these features.

### **5.3.3. Waste Storage**

The amendment will reconcile authorised disturbances within Table A1 of the EA with on-ground disturbances. As detailed in Section 5.2.9, the maximum authorised disturbance for waste management features will increase by 3.1 % increase in total disturbance attributed to features within the waste domain. The impact from the slight area increase for the WRD is negligible.

### **5.3.4. Waste Tracking and Documentation**

Waste tracking and documentation for regulated waste generated by day-to-day activities will continue to be managed by the service contractor(s), in compliance with QLD regulated waste tracking requirements, under the EP Regulation.

#### **5.3.5. Waste Disposal**

This amendment proposed the disposal of dam liners from the Process Water Pond and Kulthor Turkey's Nest as part of the rehabilitation of these water storages at closure.

PAF material, mineralized waste, construction/demolition waste, and general inert site clean-up materials are already approved for disposal within the pit. Tailings have been deposited within the Osborne underground workings surrounding and beneath the Osborne pit. It is not expected that there would be any additional impacts from the disposal of dam liners within the pit.

All general waste will continue to be disposed in accordance with established waste management procedures.



## 5.4. Air Impacts

In preparing this application, consideration has been given to guideline *ESR/2015/1840 – Application requirements for activities with impacts to air* (DETSI, 2024b). DETSI is required to assess the application against the requirements stated in the *Environmental Protection Act 1994*, EP Regulation and Environmental Protection (Air) Policy 2019 (EPP Air) to meet the environmental objective and performance outcomes described below:

### Environmental Objective

‘The activity will be operated in a way that protects environmental values of air:’

### Performance Outcome

There is no discharge to air of contaminants that may cause an adverse effect on the environment from the operation of the activity, or

All of the following:

- Fugitive emissions of contaminants from storage, handling and processing of materials and transporting materials within the site are prevented or minimised.
- Contingency measures will prevent or minimise adverse effects on the environment from unplanned emissions and shut down and start up emissions of contaminants to air.
- Releases of contaminants to the atmosphere for dispersion will be managed to prevent or minimise adverse effects on environmental values.

**RISK OF ENVIRONMENTAL IMPACT: LOW**

### 5.4.1. Overview of Air Impacts

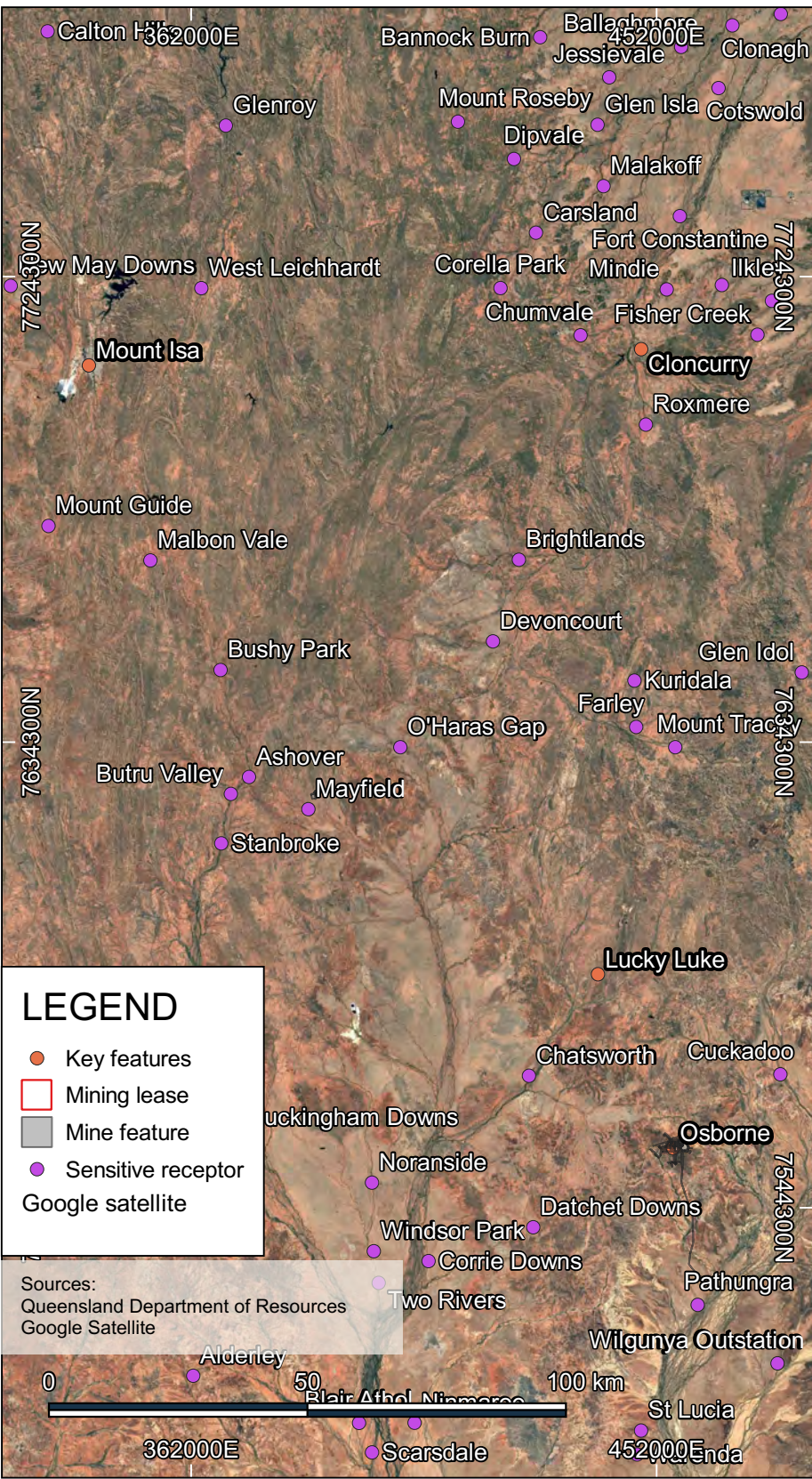
The Project is situated in an unpopulated region. The nearest sensitive receptor to the Osborne mine are the Pathungra and Kheri outstation, located approximately 5 km from the borefield lease. There are no homesteads in proximity to the main mining and processing area at Osborne, or within the vicinity of Lucky Luke (Figure 23). Chinova has means to provide correspondence with the surrounding landholders on a as needs basis. The nearest major centre is Cloncurry, located approximately 155 km north.

The reconciliation of on-ground disturbances and inclusion of existing features within Table A1 proposed by this amendment is strictly administrative. The additional on-ground disturbances and existing features (i.e., borrow pits, TSF2 East Environmental Dam, administration office, magazine, and topsoil stockpiles) are currently in use and no further disturbances are proposed.

No potential air impacts will result from the disposal of water and dam liners within the Osborne pit.



Project activities will continue to be undertaken with existing management controls; no additional controls are required or proposed.





**EA AMENDMENT**

**FIGURE 23. SENSITIVE RECEPTORS**

 <div>Disclaimer: Whilst every effort and care has been taken to ensure the accuracy of this report, Wulguru Technical Services Pty Ltd makes no representations or warranties about its accuracy, reliability, completeness or suitability for any particular purpose and disclaims all responsibility and all liability (including without limitation, liability in negligence) for all expenses, losses, damages (including indirect or consequential damage) and costs which you might incur as a result of the product being inaccurate or incomplete in any way and for any reason.</div>	CRS: GDA2020 / MGA zone 54		Date: 4 September 2025	 <div>WULGURU TECHNICAL SERVICES</div>
			Author: H. Robb	
	Project Number: 2025.03007	Client: Chinova Resources Pty Ltd	Version: 0.01	



#### **5.4.2. Fugitive Emissions**

Overclear for authorised features (i.e., roads, exploration), as well as existing borrow pits and topsoil stockpiles requiring authorisation have the potential to generate fugitive emissions (wind-blown dust). All borrow pits, the magazine and processing plant topsoil stockpiles, and the balance of overclear is located within the main mining and processing area of Osborne and will be located a minimum of 25 km away from the closest sensitive receptor (Kheri Station). It is unlikely that fugitive emissions from these features will impact sensitive receptors.

The disposal of water and dam liners within the Osborne pit will be undertaken in a way that does not produce fugitive emissions. Additionally, the continued operation of TSF2 East Environmental Dam will not result in the generation of fugitive emissions.

Chinova will continue to monitor air quality through the Osborne Air Quality Monitoring Program, which has been prepared in accordance with Schedule B – Air, Condition B2-2 of the EA.

#### **5.4.3. Management of Air Impacts**

The amendment does not propose any changes to air impacts, and impacts to air will continue to be managed in accordance with Schedule B – Air of the EA. There are no sensitive receptors within 25 km of the main mining and processing area at Osborne. Given the low likelihood of air quality impacts at sensitive receptors, Chinova has not developed air quality management controls for the Osborne Project.

#### **5.4.4. Contingency Measures**

If monitoring or visual assessment detects significant emissions to air, works will cease until appropriate controls are implemented and emissions are reduced.

## 5.5. Noise Impacts

In preparing this application, consideration has been given to guideline *ESR/2015/1838 – Application requirements for activities with noise impacts* (DETSI, 2024e). DETSI is required to assess the application against the requirements stated in the *Environmental Protection Act 1994*, EP Regulation and the Environmental Protection (Noise) Policy 2019 (EPP Noise) to meet the environmental objective and performance outcomes described below:

### Environmental Objective

'The activity will be operated in a way that protects the environmental values of the acoustic environment.'

### Performance Outcome

- Sound from the activity is not audible at a sensitive receptor, or
- The release of sound to the environment from the activity is managed so that adverse effects on environmental values, including health and wellbeing and sensitive ecosystems, are prevented or minimised.

**RISK OF ENVIRONMENTAL IMPACT: LOW**

### 5.5.1. Overview of Noise Impacts

The Project is situated in an unpopulated region. The nearest sensitive receptor to the Osborne mine are the Pathungra and Kheri outstation, located approximately 5 km from the borefield lease. There are no homesteads in proximity to the main mining and processing area at Osborne, or within the vicinity of Lucky Luke (Figure 23).

The reconciliation of on-ground disturbances and inclusion of existing features within Table A1 proposed by this amendment is strictly administrative. The additional on-ground disturbances and existing features (i.e., borrow pits, TSF2 East Environmental Dam, administration office, magazine, and topsoil stockpiles) are currently in use and no further disturbances are proposed.

The disposal of waste is already approved for disposal within the pit. No additional noise impacts will arise from the disposal of water and dam liners, within the pit.

Accordingly, no noise impacts will result from the proposed amendment. Project activities will continue to be undertaken with existing management controls; no additional controls are required or proposed.

### 5.5.2. Noise Management

The amendment does not propose any changes to noise impacts, and noise will continue to be managed in accordance with Schedule D – Noise of the EA. There are no sensitive receptors within 25 km of the main mining and processing area at Osborne. Given the low likelihood of noise impacts to



sensitive receptors, Chinova has not developed or implemented a noise management plan for the Osborne Project.

## 6. Environmental Risk Assessment

### 6.1. Overview

An environmental risk assessment has been prepared in relation to the proposed amendment. The risk methodology utilised has been developed based on the Australia and New Zealand Standard AS/NZS for Risk Management – Principles and Guidelines (ISO 31000:2018).

The risk management process involves the systematic application of policies, procedures, and practices to the activities of communicating and consulting, establishing the context and assessing, treating, monitoring, reviewing, recording, and reporting risk (Figure 24).

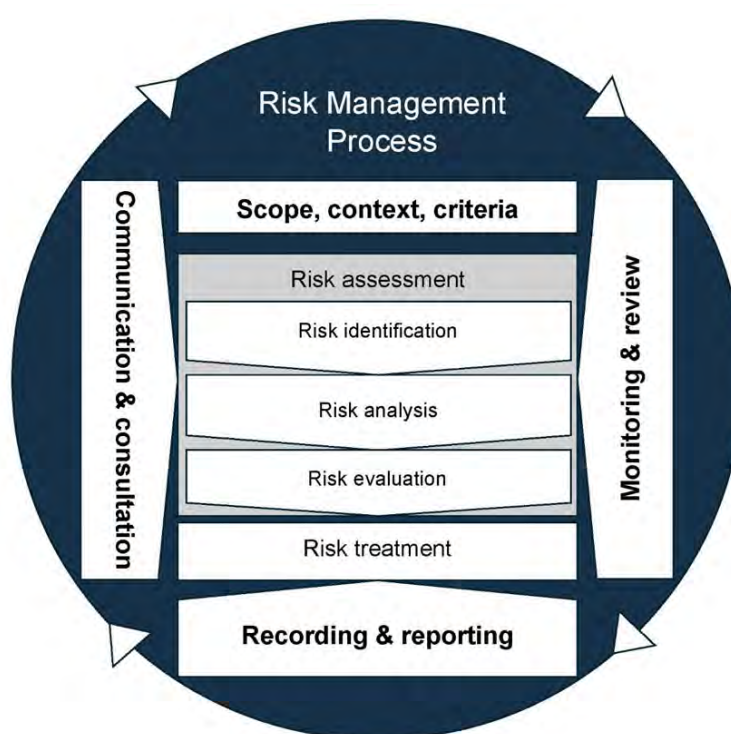


Figure 24. ISO 31000: 2018 Risk management process

### 6.2. Risk Identification

The purpose of risk identification is to find, recognise and describe risks that might help or prevent an organisation achieving its objectives. Relevant, appropriate and up-to-date information is important in identifying risks (Standards Australia, 2018).

The following factors and the relationships among these factors have been considered by this risk assessment:

- Tangible and intangible sources of risk;
- Causes and events;



- Threats and opportunities;
- Vulnerabilities and capabilities;
- Changes in the external and internal context;
- Indicators or emerging risks;
- The nature and value of assets and resources;
- Consequences and their impacts on objectives;
- Limitations of knowledge and reliability of information;
- Time-related factors; and
- Biases, assumptions, and beliefs of those involved.

### **6.3. Risk Analysis and Evaluation**

The purpose of risk analysis is to comprehend the nature of risk and its characteristics, including, where appropriate, the level of risk. Risk analysis can be undertaken with varying degrees of detail and complexity, depending on the purpose of the analysis, the availability and reliability of information and the resources available. Risk analysis techniques can be qualitative, quantitative or a combination of these and should include:

- The likelihood of events and consequences;
- The nature and magnitude of consequences;
- Complexity and connectivity;
- Time-related factors and volatility;
- The effectiveness of existing controls; and
- Sensitivity and confidence levels.

A likelihood of occurrence and severity of consequence rating has been assigned to each identified risk in accordance with the risk matrix detailed in Table 34. Control measures have been developed following the identification of risks to achieve a level of risk that is an acceptable level, as described in Table 35.

Table 34. Risk matrix

		Consequence					
	Environment	No impact to Environmental Value (EV).	Small-scale impact to EV. Localised impact confined to incident area.	Moderate-scale impact to EV. Localised impact confined to property boundary.	Large-scale impact to EV. Regional area of impact.	Extensive population or community scale impact to EV. Extensive area of impact.	
	Community and Reputation	No actual or potential community criticism.	Minor level local community criticism (<week). No reputation impact.	Local community criticism (> week) or one-day community protest. Local company reputation impacted.	State-level community criticism or protest over multiple days/ occasion. State-based company reputation impacted.	National community criticism or large-scale protest. Company reputation and approvals impact. Shareholder intervention or short-term share price impact (< month).	
	Financial (A\$)	<30K	\$30k to 300K	\$300k to 3M	\$3M to \$30M	\$30M to \$300M	
	Compliance EA, legislation, instruments (e.g. tenure licence) or contract.	Administrative non-conformance No regulatory or punitive action.	Non-conformance. Notification/report to; request for information by; and/or administrative/ warning notice from regulator.	Recurring non-conformance. Statutory notice from regulator.	Systemic administrative non-compliance (or one moderate non-conformance). Company charged with an offence or minor penalty/ fine.	Systemic moderate non-conformance (or single material non-conformance). Company charged with an offence with moderate penalty	
		1	2	3	4	5	
Likelihood	Almost Certain (< 4 months) Occurs in almost all circumstances OR could occur within days to week.	5	Medium (6)	High (7)	High (8)	Very High (9)	Very High (10)
	Likely (4 months – 3 yearly) Occurs in most occurrence OR could occur within weeks to month.	4	Medium (5)	Medium (6)	High (7)	High (8)	Very High (9)
	Occasional (3 - 8 yearly) Has occurred before in OR could occur with months to years.	3	Low (4)	Medium (5)	Medium (6)	High (7)	High (8)
	Possible (8 - 15 yearly) Has occurred elsewhere OR could occur with decades	2	Low (3)	Low (4)	Medium (5)	Medium (6)	High (7)
	Unlikely (15 - 100 yearly) Has occurred elsewhere OR could occur within decades.	1	Low (2)	Low (3)	Low (4)	Medium (5)	Medium (6)

Table 35. Risk scores

Risk Score	Risk Rating	Actions Required
9 – 10	Extreme	Requires immediate action to reduce risk score.
7 – 8	High	Requires an action plan approved by senior management.
5 – 6	Moderate	Specific monitoring and procedures required.
2 - 4	Low	Management through routine procedures and protocols.



## 6.4. Risk Assessment Results

Risks identified were assessed using the methodology described above. Eighteen (18) risks were identified with all eighteen rated as 'Low'. All risks considered the existing and proposed controls to reduce the level of risk to as low as reasonably practicable. Control strategies are reflected in Table 36.

**Table 36. Risk assessment**

Aspect	Potential Impact	Risk Rating			Risk Controls	Residual Risk Rating			Treatment	Comments
		L	C	R		L	C	R		
Land	Potential for livestock and native fauna to drink water from TSF2 East Environmental Dam.	2	2	4	<p>Water quality be sampled as per the proposed updated Table C11 of the EA (refer Table 8) on a quarterly basis.</p> <p>Water within storages to achieve requirements of Table C12 (Dam Water Quality Levels).</p> <p>If water quality within regulated structures does not achieve the requirements of Table C12 (Dam Water Quality Levels), native fauna access is to be minimised.</p> <p>The ML is fenced to prevent cattle access.</p> <p>Ongoing landholder communication.</p>	1	2	3	If cattle are observed within the MLs, landholder will be notified and directed to remove.	
	Potential for livestock and native fauna drinking water from the borrow pits.	2	2	4	<p>If water is observed within the borrow pits, native fauna and cattle access is to be minimised.</p> <p>The ML is fenced to prevent cattle access.</p>	1	2	3	If cattle are observed within the MLs, landholder will be notified and directed to remove.	



Aspect	Potential Impact	Risk Rating			Risk Controls	Residual Risk Rating			Treatment	Comments
		L	C	R		L	C	R		
					Ongoing landholder communication.					
	Emissions from TSF2 East Environmental Dam to land.	2	3	5	<p>Release of waters is only to occur from authorised release points as specified in Table C1 (Contaminant Release Points) of the EA. No additional releases are proposed to be authorised.</p> <p>Regular inspections and maintenance of water storages to be undertaken by authorised personnel.</p> <p>TSF2 East Environmental Dam was constructed with significantly greater capacity (61.6 ML) than what is required for the catchment (49.2 ML).</p> <p>If TSF2 East Environmental Dam is likely to release, a temporary pump and generator will be used to transfer water to the TSF2 Reclaim Dam via the nearby TSF2 Reclaim Dam Drain.</p>	1	3	4	Any exceedances of water quality limits will be investigated and reported.	Contingency storages are available to manage water balances.
	Emissions from borrow pits to land.	2	1	3	Release of waters is only to occur from authorised release points as specified in Table C1 (Contaminant Release Points) of the EA. No	1	1	2	Any release of water from the borrow pits will be	Contingency storages are available to manage water balances.

Aspect	Potential Impact	Risk Rating			Risk Controls	Residual Risk Rating			Treatment	Comments
		L	C	R		L	C	R		
					additional releases are proposed to be authorised.  In the event that water in the borrow pits is likely to release (i.e., overtopping), a temporary pump and generator will be used to transfer water to TSF2 East Environmental Dam. Should TSF2 East Environmental Dam approach maximum capacity, contingency measures are in place to transfer water to TSF2 Reclaim Dam Drain and ultimately to TSF2 Reclaim Dam.				investigated and reported.	
	Potential for insufficient rehabilitation material for reconciled features and overclear.	2	4	6	Investigate residual stockpiles for suitability for rehabilitation.  Undertake soil characterisation assessments and develop additional rehabilitation sources (i.e., borrow pits) onsite to source potential rehabilitation material for closure.	2	2	4	Source additional rehabilitation material from offsite.	



Aspect	Potential Impact	Risk Rating			Risk Controls	Residual Risk Rating			Treatment	Comments
		L	C	R		L	C	R		
	Increase in disturbance area across the Project (overclear and additional features)	3	3	6	<p>No future disturbance is proposed. Any future activities will be assessed through a future amendment application.</p> <p>Revised spatial disturbance data has been prepared which will be used to audit on ground disturbance and prevent overclear.</p>	1	3	4		Additional disturbance is located in 'least concern' vegetation. No SRI was determined for any matter.
Water	Release of water from TSF2 East Environmental Dam.	2	3	5	<p>Release of waters is only to occur from authorised release points as specified in Table C1 (Contaminant release points) of the EA. No additional releases are proposed to be authorised.</p> <p>Regular inspections and maintenance of water storages to be undertaken by authorised personnel.</p> <p>TSF2 East Environmental Dam was constructed with significantly greater capacity (61.6 ML) than what is required for the catchment (49.2 ML).</p>	1	3	4	<p>Any exceedances of water quality limits will be investigated and reported.</p> <p>A contaminated land assessment will be completed on closure, and any residual contaminants will be removed as part of rehabilitation activities.</p>	Contingency storages are available to manage water balances.

Aspect	Potential Impact	Risk Rating			Risk Controls	Residual Risk Rating			Treatment	Comments
		L	C	R		L	C	R		
					The ML is fenced to prevent access to livestock.					
	Release of water from borrow pits.	2	1	3	<p>Release of waters is only to occur from authorised release points as specified in Table C1 (Contaminant Release Points) of the EA. No additional releases are proposed to be authorised.</p> <p>In the event that water in the borrow pits is likely to release (i.e., overtopping), a temporary pump and generator will be used to transfer water to TSF2 East Environmental Dam. Should TSF2 East Environmental Dam approach maximum capacity, contingency measures are in place to transfer water to TSF2 Reclaim Dam Drain and ultimately to TSF2 Reclaim Dam.</p>	1	1	2	Any release of water from the borrow pits will be investigated and reported.	Contingency storages are available to manage water balances.
	Transport of contaminants from seepage from TSF2 East Environmental Dam,	2	2	4	TSF2 East Environmental Dam constructed into impermeable Mesozoic Sediments.	1	2	3	Frequent groundwater monitoring to be undertaken in accordance with Table C7 (Groundwater	



Aspect	Potential Impact	Risk Rating			Risk Controls	Residual Risk Rating			Treatment	Comments
		L	C	R		L	C	R		
	resulting in impact to groundwater quality.				Limited groundwater is available within the Osborne area. That which is present is highly compartmentalised and slow flowing.  Regular inspections and maintenance of water storages to be undertaken by authorised personnel.				monitoring locations and frequency) of the EA.	
	Transport of contaminants from seepage from borrow pits resulting in impact to groundwater quality.	2	2	4	Borrow pits are situated within impermeable Mesozoic Sediments.  Surface water is contained within the pits for short timeframes, limiting potential groundwater seepage.  Limited groundwater is available within the Osborne area. That which is present is highly compartmentalised and slow flowing.	1	2	3	Frequent groundwater monitoring to be undertaken in accordance with Table C7 (Groundwater monitoring locations and frequency) of the EA.	
	Reduced surface water quality and increased occurrence of stream sedimentation resulting from increased erosion.	2	3	5	Release of waters is only to occur from authorised release points as specified in Table C1 (Contaminant release points) of the EA. No additional releases are proposed to be authorised.	1	3	4	Any exceedances of water quality limits and sediment quality will be investigated and reported.	

Aspect	Potential Impact	Risk Rating			Risk Controls	Residual Risk Rating			Treatment	Comments
		L	C	R		L	C	R		
					<p>Sediment quality of receiving waters and reference waters to be monitored twice yearly.</p> <p>Appropriate ESC measures in line with the site Erosion and Sediment Control Management Plan are to continue to be implemented.</p>					
	Increase in disturbance area across the Project (overclear) impacting upon watercourses.	2	3	5	<p>No future disturbance is proposed. Any future activities will be assessed through a future amendment application.</p> <p>Current water management procedures will continue to be enacted.</p>	1	3	4		Impacts to water quality resulting from overclear are negligible and indiscernible from existing authorised feature disturbance.
Waste	Incorrect storage or disposal of waste resulting in release of contaminants.	2	2	4	<p>The waste hierarchy will continue to be implemented for all streams.</p> <p>Waste storage, transport and disposal will continue as per existing waste management procedures.</p> <p>Waste will either be disposed at the onsite landfill or pit, in accordance with the EA, or removed from the site.</p>	1	2	3	<p>Conduct activities in accordance with the Waste Management Plan.</p> <p>A contaminated land assessment will be completed on closure and any residual contaminants will be</p>	Waste (PAF material, mineralized waste, construction and demolition waste, and general inter site clean-up materials) are approved for disposal within the Osborne pit. It is not expected that there would



Aspect	Potential Impact	Risk Rating			Risk Controls	Residual Risk Rating			Treatment	Comments
		L	C	R		L	C	R		
					Waste rock will continue to be stored within designated WRDs.				removed as part of the rehabilitation activities.	be any additional impacts from the disposal of dam liners within the pit.
	Increase in disturbance area across the Project (overclear) impacting waste.	3	3	6	<p>No future disturbance is proposed. Any future activities will be assessed through a future amendment application.</p> <p>No change to waste types or disposal methods are proposed.</p>	1	3	4		Impacts to was quality resulting from overclear are negligible and indiscernible from existing authorised feature disturbance.
Air	Emissions to air resulting in nuisance at a sensitive receptor.	1	1	2	<p>The nearest sensitive receptor is Kheri Station, approximately 25 km from the main mining and processing area at Osborne.</p> <p>Continue to conduct activities in accordance with Schedule B – Air of the EA.</p> <p>Continue to monitor air quality in accordance with the Osborne Air Quality Monitoring Program.</p> <p>When directed by the administering authority, conduct air quality monitoring including meteorological</p>	1	1	2		<p>Impacts for overclear and existing, unauthorised features are negligible and indiscernible from existing authorised feature disturbance.</p> <p>Water and dam liners will be disposed within the pit in a manner which does not produce fugitive emissions.</p>

Aspect	Potential Impact	Risk Rating			Risk Controls	Residual Risk Rating			Treatment	Comments
		L	C	R		L	C	R		
					monitoring, dust depositional sampling and volumetric monitoring.  Community complaints/grievances will be recorded and actioned.					
	Increase in disturbance area across the Project (overclear) impacting emissions to air.	1	1	2	No future disturbance is proposed. Any future activities will be assessed through a future amendment application.  Current air quality management procedures will continue to be enacted.	1	1	2		Impacts to air quality resulting from overclear are negligible and indiscernible from existing authorised feature disturbance.
Noise	Increase in noise at sensitive receptor.	1	1	2	Continue to conduct activities in accordance with Schedule D – Noise of the EA.  The nearest sensitive receptor is Kheri Station, approximately 25 km from the main mining and processing area at Osborne.  Record and investigate community noise complaints/grievance.	1	1	2		Impacts are negligible and indiscernible from existing authorised feature disturbance.



Aspect	Potential Impact	Risk Rating			Risk Controls	Residual Risk Rating			Treatment	Comments
		L	C	R		L	C	R		
					Conduct noise monitoring as required.					
	Increase in disturbance area across the Project (overclear) impacting noise emissions.	1	1	2	<p>No future disturbance is proposed. Any future activities will be assessed through a future amendment application.</p> <p>Current water management procedures will continue to be enacted.</p>	1	1	2		No work is proposed; therefore, no additional noise emissions are proposed.

## **7. Ecologically Sustainable Development**

It is acknowledged that all standard criteria under s. 176 of the EP Act must be considered as part of the decision-making process for an EA application. This section provides responses to those criteria that are most relevant to the proposed amendment, with consideration given to the broader context of all applicable standard criterion.

### **7.1. The Precautionary Principle**

The Precautionary Principle dictates that where there are threats to serious or irreversible environmental damage, lack of full scientific certainty should not be used as a reason for postponing measures to prevent environmental degradation.

The amendment seeks to reconcile historical disturbance and authorisation for previously unauthorised, existing features, ensuring all features and disturbance onsite are lawful and will facilitate accurate and comprehensive rehabilitation and closure planning.

Additionally, the amendment seeks the approval to dispose residual water from water storages and dam liners from the Process Water Pond and Kulthor Turkey's Nest within the Osborne Pit at closure. This will allow for the disposal of potentially contaminated waters and dam liners in a safe and non-polluting manner, within a structure already authorised for the storage of potentially contaminated material.

Impacts result from the existing unauthorised disturbance (i.e., overclear and unapproved features) are well understood and considered minimal. Established control measures – including the Chinova Erosion and Sediment Control Plan and Water Management Plan – have proven effective in mitigation potential environmental risks.

Similarly, the disposal of water and dam liners within the Osborne Pit is a well-understood and low risk activity. It will be undertaken in accordance with the Osborne Mine In-pit Tailings Storage Facility Operations and Maintenance Manual (SLR, 2022b).

### **7.2. Intergenerational Equity**

The intergenerational equity principle requires that the current generation should ensure that the health, diversity and productivity of the environment is maintained or enhanced for the benefit of future generations.

The amendment does not propose any additional clearing that may impact upon future generations.

The amendment will facilitate accurate and comprehensive rehabilitation and closure planning to ensure the health, diversity and productivity of the environment for future generations. Rehabilitation goals and objectives have been developed for the PRCP, which will be revised to include additional disturbance following the reconciliation of historical disturbance and authorisation of existing, unauthorised features.



PMLUs have been detailed within Section 5.1.14 and will predominantly comprise native vegetation with low intensity grazing established across the Project area.

### **7.3. Conservation of Biological Diversity and Ecological Integrity**

This principle dictates that the conservation of biological diversity and the maintenance of ecological integrity should be a fundamental consideration for development proposals.

No MNES or MSES are expected to have been, or will be impacted, by the proposed amendments to the EA. No offsets at either the State or Commonwealth level are required as part of this amendment.

No further disturbance is proposed as part of this amendment.

### **7.4. Public Interest**

The potential for public interest in this amendment is likely limited; however, the amendment will result in the following outcomes which will result in net social and environmental benefits:

- Ensure that all Project disturbance is lawful;
- Reconciliation of historical disturbance and formal authorisation of existing, previously unauthorised features will support comprehensive and accurate rehabilitation and closure planning. This will enable effective rehabilitation outcomes and the achievement of a safe, stable, and productive post-mining land use; and
- Facilitate the safe and non-polluting storage and disposal of potentially contaminated water and dam liner material within an existing structure already authorised for the containment of potentially contaminated materials.

## 8. Conclusions and Recommendations

This report is submitted to the DETSI in support of Chinova Resources Osborne Pty Ltd's application for an EA amendment to EA EPML00873613 and provides a detailed response to the following guidelines:

- *Approval processes for Environmental Authorities* (DETSI, 2024a);
- *Application requirements for activities with impacts to air* (DETSI, 2024b);
- *Application requirements for activities with impacts to land* (DETSI, 2024c);
- *Application requirements for activities with impacts to water* (DETSI, 2024d);
- *Application requirements for activities with noise impacts* (DETSI, 2024e); and
- *Application requirements for activities with waste impacts* (DETSI, 2024f).

Risks were assessed in accordance with ISO 31000:2018. Eighteen (18) risks were identified with all rated as 'Low'. All risks considered the existing and proposed controls to reduce the level of risk to as low as reasonably practicable. Control strategies are reflected in supporting information contained within this document.

It is recommended that this amendment application for EA EPML00873613 be accepted with appropriate and reasonable conditions.



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## **Appendix A: Proposed Schedule J – Maps and Plans**



Landfill  
Google Satellite

Sources:  
Google Satellite



**SCHEDULE I - FIGURE 3. (GENERAL WASTE DISPOSAL AREA)**



60                      0                      60                      120 m

CRS: GDA2020 / MGA zone 54  
Scale: 1:2,500 @A3

Date: 18 June 2025

Author: J. McLachlan

Version: 0.01



**WULGURU TECHNICAL SERVICES**

Project Number: 2025.03007

Client: Chinova Resources Osborne Pty Ltd



## **Appendix B: PSMT Report**

## **Appendix C: MSES Report**



## **Appendix D: Osborne Mine Detailed Design Report – East Environmental Dam and Borrow Area 4 Dam**

