

Environmental Protection Act 1986

Section 43A

**NOTICE OF DECISION TO CONSENT TO AMEND A REFERRED PROPOSAL
DURING ASSESSMENT**

PERSON TO WHOM THIS NOTICE IS GIVEN

- (a) Australian Vanadium Limited (ABN 90 116 221 740)
Level 3, 1060 Hay Street
WEST PERTH WA 6005

PROPOSAL TO WHICH THIS NOTICE RELATES:

Australian Vanadium Project – Mining and Beneficiation Operations
Assessment No.2287

Pursuant to s. 43A of the *Environmental Protection Act 1986* (EP Act), the Environmental Protection Authority (EPA) gives approval to the assessment of the proposal being completed in respect of the proposal as amended in accordance with the proponent's request:

- Overall change in the development envelopes (including mining, access road and infrastructure corridor and pipeline corridor): 10,935 ha to 12,020 (increase of 1,085 ha [10%]).
- Overall change in the disturbance footprint: 3,806 ha to 2,657 ha [decrease of 1,149 ha [30%]].
- Removal of physical element Meekatharra-Sandstone Rd Diversion
- New element – pipeline corridor development envelope (2,430 ha) and disturbance area (47 ha).
- Water Abstraction – identification of groundwater impact zones.
- Disposal of excess water - reinjection of up to 4.4 GL/a water to the deep aquifer within the boundary of the reinjection Borefield and/or discharge (of up to 2.6 GL/annum) via pipeline to Lake Annean.
- Addition of Ore production rate.
- Minor word changes.

The amended proposal content document and figures are attached.

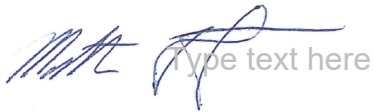
EFFECT OF THIS NOTICE:

1. The assessment of the proposal is to be completed in respect of the proposal as amended in accordance with the decision set out in this notice.

2. The proposal as amended in accordance with this notice is taken to have been referred to the EPA under s. 38 of the EP Act.

RIGHTS OF APPEAL:

There are no rights of appeal under the EP Act in respect of this decision.



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Prof. Matthew Tonts
Delegate of the Environmental Protection Authority
CHAIR

15 July 2022

Attachment 1- Amended proposal content document and figure/s showing the amendments

Table 1: General proposal description

Proposal title	Australian Vanadium Project – Mining and Beneficiation Operations
Proponent name	Australian Vanadium Limited
Short description	The proposal is to mine and beneficiate vanadium ore to produce an enriched vanadium-iron concentrate. The proposal includes an open pit mine, crushing, milling, flotation, and magnetic separation (beneficiation) plant, waste rock and tailings storage, and support infrastructure, located 40 km south-southeast of Meekatharra.

Table 2: Proposal content elements

Proposal element	Location / description	Maximum extent, capacity, or range
Physical elements		
Mine, Beneficiation and Associated Infrastructure	Figure 1.1	Clearing of no more than 1,940 ha of native vegetation within the 6,965 ha Mine Development Envelope
Access Road and Infrastructure Corridor	Figure 1.2	Clearing of no more than 670 ha of native vegetation within the 2,625 ha Infrastructure Corridor Development Envelope
Pipeline Corridor	Figure 1.3	Clearing of no more than 47 ha of native vegetation within the 2,430 ha Pipeline Corridor Development Envelope
Open Pits	Figure 1.1	The open pits cover a combined maximum surface area 350 ha within the Open Pits Disturbance Footprint. The maximum depth of the open pits is 250 mAHD.
Operational elements		
Groundwater Drawdown	Figure 1.4	Limit of groundwater drawdown (groundwater depth compared to baseline groundwater level prior to commencing groundwater abstraction) due to the proposal operations does not extend beyond: <ul style="list-style-type: none"> • More than 10 m of groundwater drawdown does not extend outside of the High Groundwater Impact Zone • Outside of the Partial Groundwater Impact Zone groundwater drawdown remains less than 2 m.
Reinjection Groundwater	to Figure 1.1	Reinjection of up to 4.4 GL/a water to the deep aquifer within the boundary of the reinjection borefield. Quality of the reinjected water may range from brackish to hypersaline.

Proposal element	Location / description	Maximum extent, capacity, or range
Discharge of excess water to Lake Annean	Figure 1.1	Discharge of up to 2.6 GL/a of water to Lake Annean via pipeline. Quality of the discharged water may range from brackish to hypersaline
Beneficiation Waste	Figure 1.1	Disposal of no more than 920,000 tpa of tailings solids into the Integrated Waste Landform tailings cells.
Proposal elements with greenhouse gas emissions		
Peak Annual Average:		
Scope 1	Mine Facility: 63,775 t CO ₂ -e per annum	
Scope 2	Not Applicable	
Scope 3	Transport within WA and Processing Facility: 142,905 t CO ₂ -e per annum	
Commissioning		
<i>Construction and commissioning will not exceed the physical and operational elements detailed above</i>		
Rehabilitation and Decommissioning		
<i>Rehabilitation and decommissioning will be undertaken in accordance with the Mine Closure Plan, which will be approved and administered by the Department of Mines, Industry Regulation and Safety.</i>		
Other elements which affect extent of effects on the environment		
Ore Production Rate	Target ore production rate during operations of 1.0-2.2 million tonnes per annum of target grade ore.	Should the ore production rate be significantly different than the target, the duration of proposal operations will vary accordingly.
Proposal time	Maximum project life	30 years, plus any periods of temporary cessation of operations, or any increase in proposal duration due to periods of low ore production volume.
	Construction and commissioning phase	2-3 years
	Operations phase	25 operational years for proposed open pits at design ore production rate. The number of operational years may increase if ore production volume per year is less than design. Operations phase excludes any unplanned periods of care and maintenance or other temporary cessation of operations
	Decommissioning phase	Estimated 2-3 years, with subsequent 10 years post-closure monitoring.

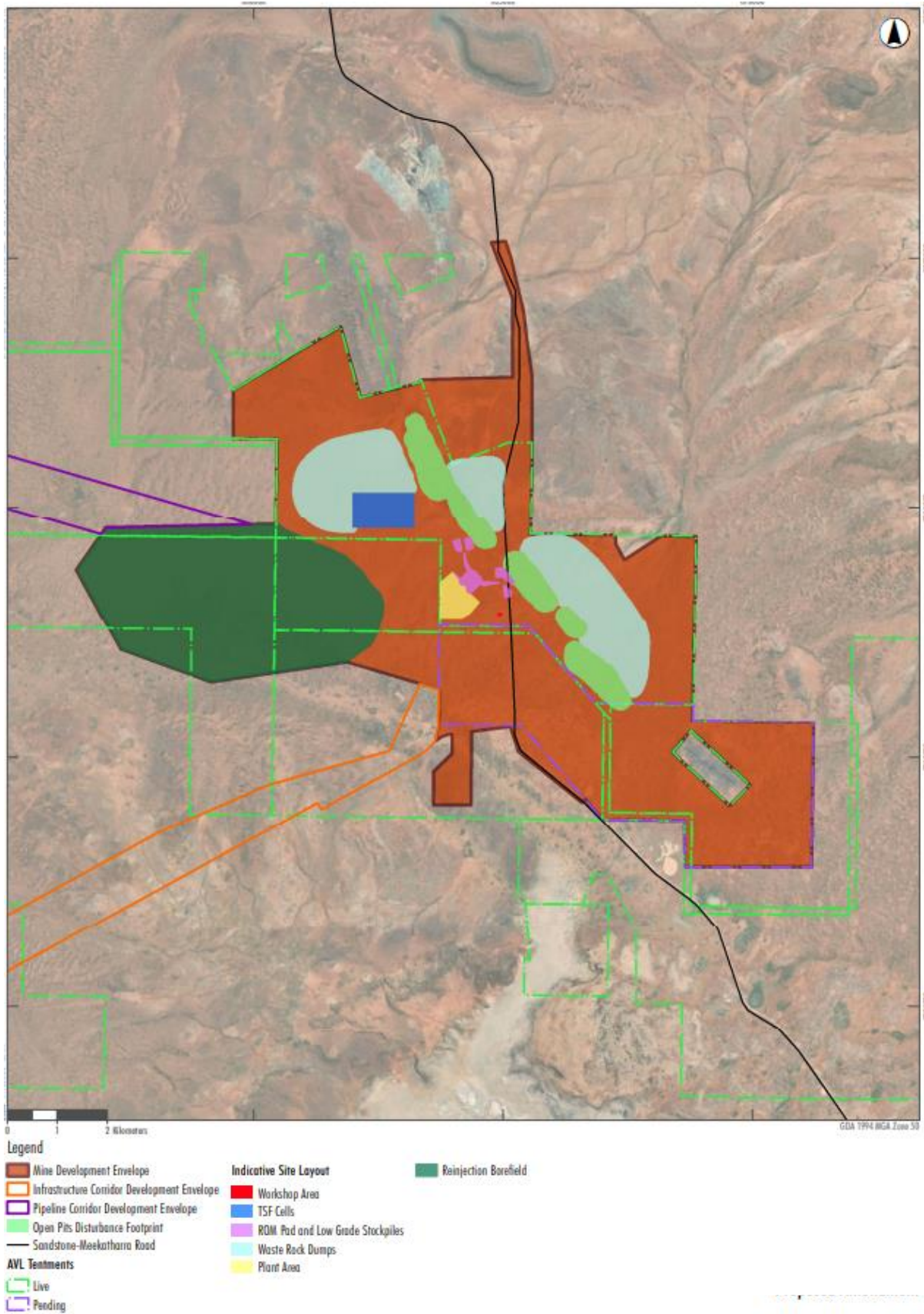


Figure 1.1 Development Envelopes and Disturbance Footprint (Indicative Site Layout)

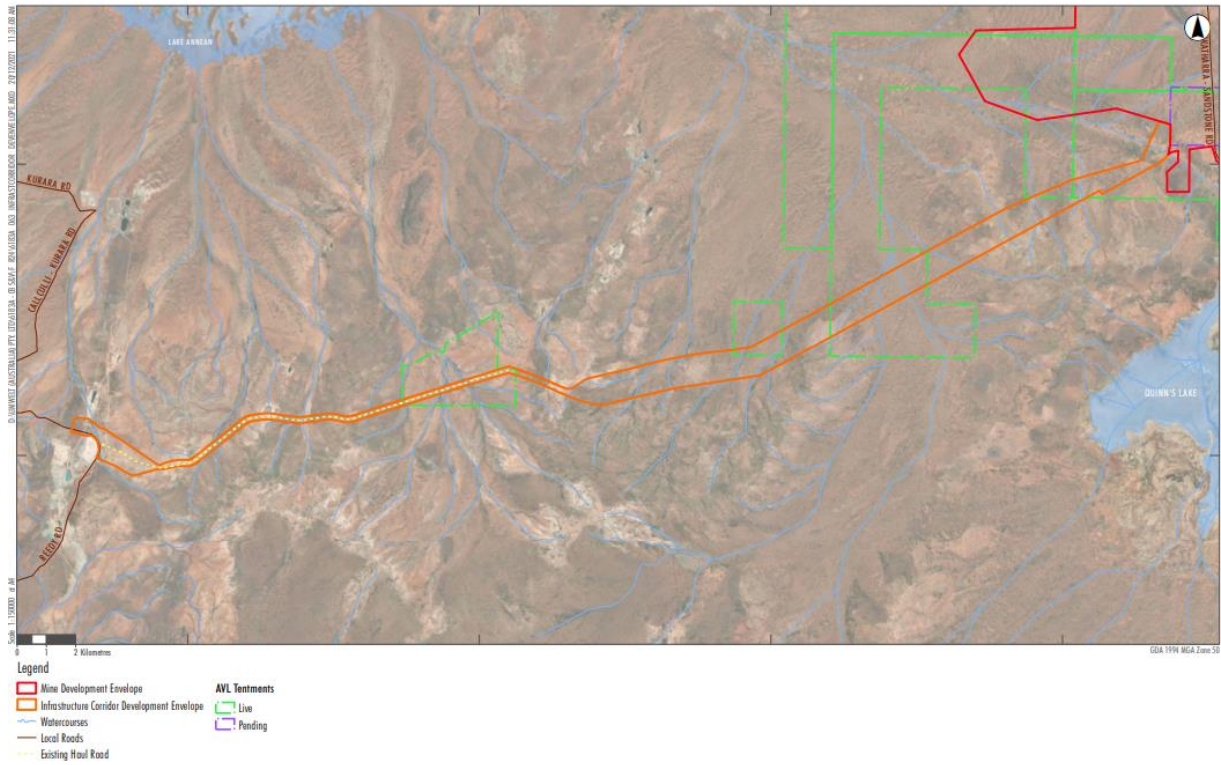


Figure 1.2 Infrastructure Corridor Development Envelope

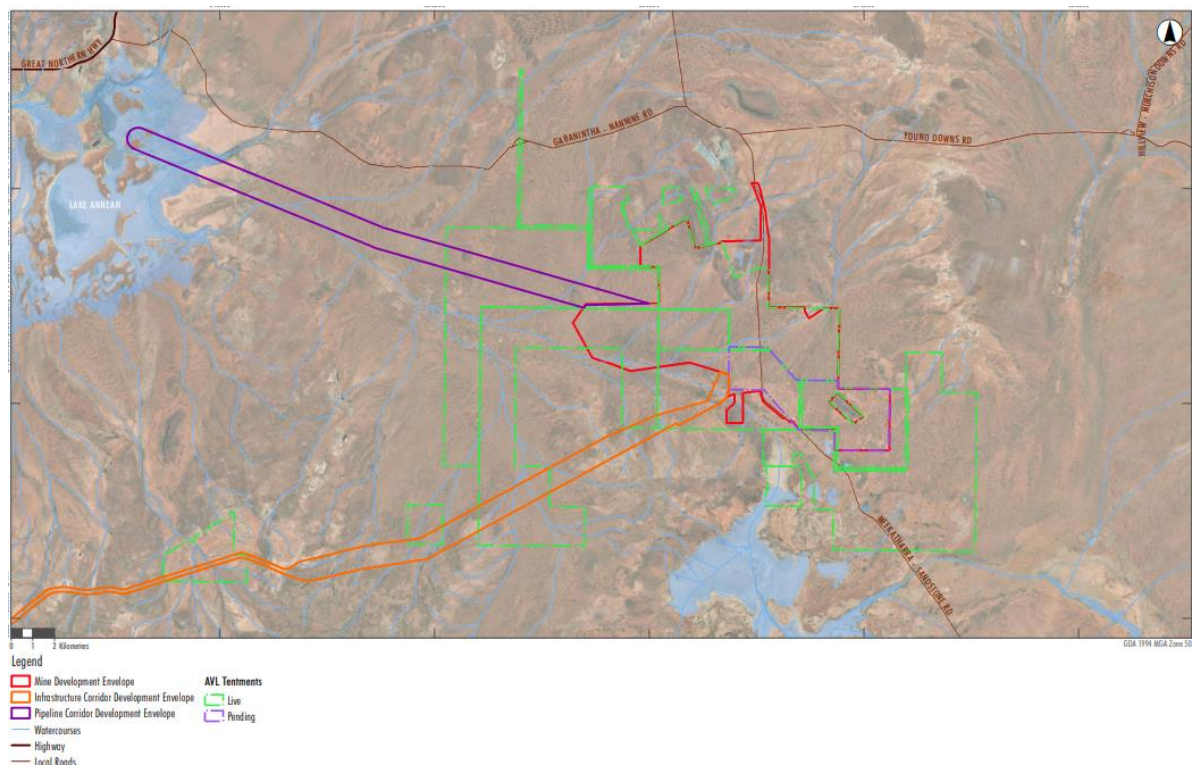


Figure 1.3 Pipeline Corridor Development Envelope

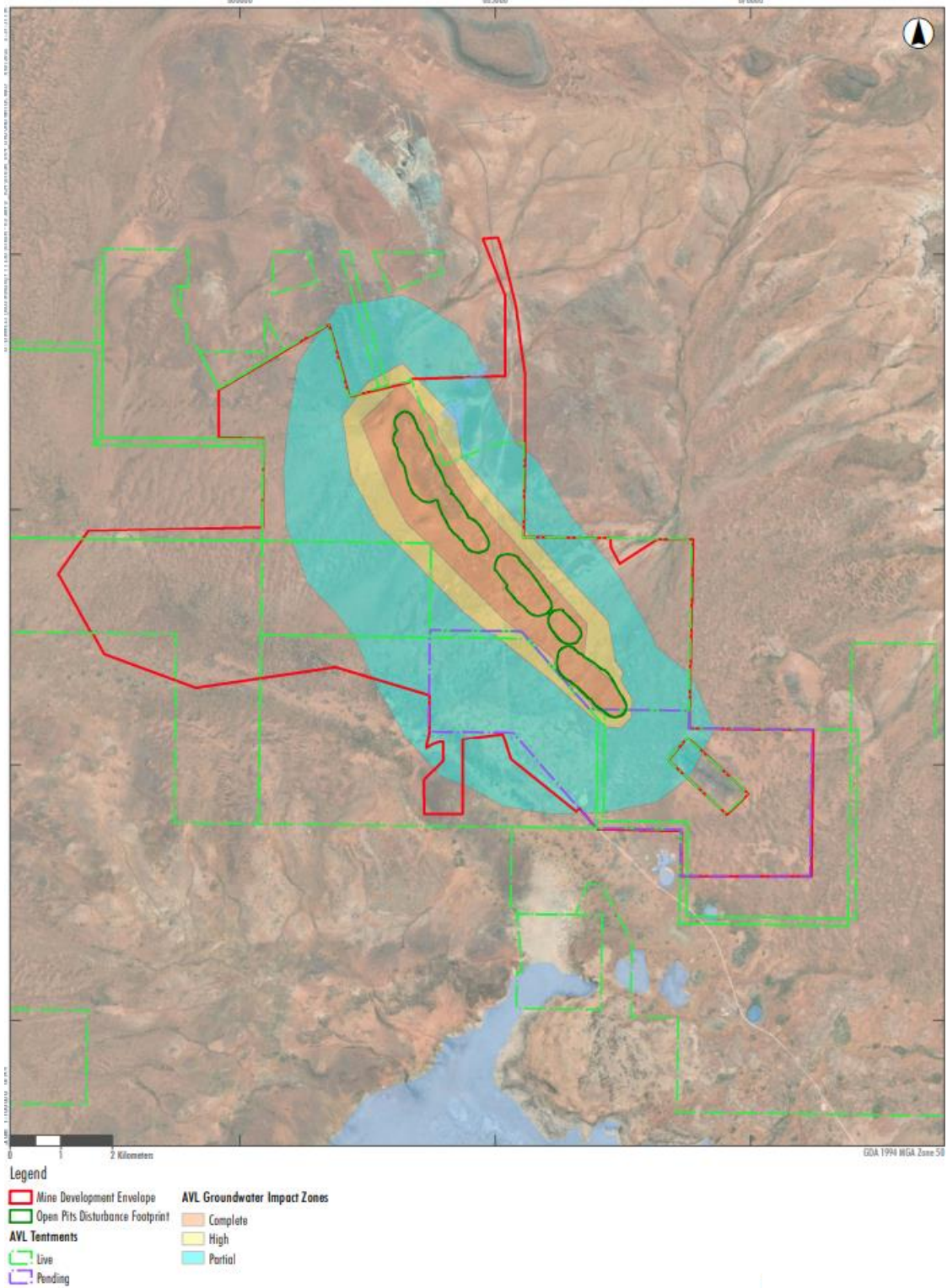


Figure 1.4 Groundwater Impact Zones

Summary of reasons for decision – request to amend a referred proposal during assessment under s. 43A of the *Environmental Protection Act 1986*

Proposal title: Australian Vanadium Project- Mining and Beneficiation Operations

Environment Online Reference Number: n/a

Date request to amend referred proposal under s. 43A received: 01-04-2022

Proponent: Australian Vanadium Limited

Proposal referral date: 14-03-2021

Level of assessment: Referral Information with additional information required under section 40(2)(a) of the Environmental Protection Act 1986 (2-week public review).

Existing referred proposal:

The proposal is to mine and beneficiate vanadium ore to produce an enriched vanadium iron concentrate. The proposal includes an open pit mine, crushing, milling, flotation, and magnetic separation (beneficiation) plant, waste rock and tailings storage, and support infrastructure, located 40 km south-southeast of Meekatharra.

- Clearing of no more than 2,700 ha of native vegetation within the 8,295 ha Mine Development Envelope.
- Clearing of no more than 6 ha of native vegetation within the 15 ha Diversion Development Envelope.
- Clearing of no more than 1,100 ha of native vegetation within the 2,625 ha Infrastructure Corridor Development Envelope.
- The open pits cover a combined maximum surface area of 350 ha within the Open Pits Disturbance Footprint.
- Groundwater abstraction of no more than 3 gigalitres per annum.

No excess water discharges to the environment are proposed.

Short description of amendment(s) sought:

Table 1 provides an overview of the proposed amendments which more accurately reflect updated hydrogeological modelling predictions. The Development Envelope for the Mine and associated infrastructure is to be reduced by 1,330 ha from 8,295 ha to 6,965 ha. The proposed clearing associated with this area has also been reduced by 760 ha. There is also a reduction in clearing within the Infrastructure Corridor Development Envelope. There is an addition of a pipeline corridor Development Envelope (2,430 ha) with clearing of up to 47 ha of vegetation. Excess water is proposed to be discharged via a managed aquifer recharge (MAR) reinjection borefield and/or pipeline to Lake Annean (Pipeline corridor).

Table 1: proposed changes from the original proposal

Element	Original Proposal	s.43a (Amended Proposal)
Mine, Beneficiation and Associated Infrastructure	Clearing of no more than 2,700 ha of native vegetation within the 8,295 ha Mine Development Envelope	Clearing of no more than <u>1,940 ha</u> of native vegetation within the <u>6,965 ha</u> Mine Development Envelope.

Element	Original Proposal	s.43a (Amended Proposal)
Meekatharra-Sandstone Rd Diversion	Clearing of no more than 6 ha of native vegetation within the 15 ha Diversion Development Envelope	Removed.
Access Road and Infrastructure Corridor	Clearing of no more than 1,100 ha of native vegetation within the 2,625 ha Infrastructure Corridor Development Envelope.	Clearing of no more than <u>670 ha</u> of native vegetation within the 2,625 ha Infrastructure Corridor Development Envelope.
Pipeline corridor	-	<u>Clearing of no more than 47 ha of native vegetation within the 2,430 ha Pipeline Corridor Development Envelope.</u>
Open Pits	The open pits cover a combined maximum surface area 350 ha within the Open Pits Disturbance Footprint.	<u>The maximum depth of the open pits is 250 mAHD.</u>
Groundwater Abstraction	Groundwater abstraction of no more than 3 GL/a.	Groundwater drawdown as a result of implementing the proposal: <u>Groundwater drawdown (groundwater depth compared to baseline groundwater level prior to commencing groundwater abstraction) does not extend:</u> <ul style="list-style-type: none"> • <u>beyond 10 m of groundwater drawdown;</u> and • <u>outside of the High Groundwater Impact Zone.</u> <u>Outside of the Partial Groundwater Impact Zone, groundwater drawdown remains less than 2 m.</u>
Reinjection to groundwater	-	<u>Reinjection of up to 4.4 GL/a water to the deep aquifer within the boundary of the reinjection borefield. Salinity of the reinjected water may range from brackish to hypersaline.</u>
Discharge of excess water to Lake Annean		<u>Discharge of up to 2.6 GL/a of water to Lake Annean via pipeline. Salinity of discharged water may range from brackish to hypersaline.</u>
Ore production rate	-	<u>Up to 1.0 up to 2.2 million tonnes per annum.</u>
Beneficiation Waste	Disposal of no more than 920,000 tpa of iron-sinks rejects (tailings	Disposal of no more than 920,000 tpa of <u>tailings solids</u> into the Integrated Waste Landform tailings cells.

Element	Original Proposal	s.43a (Amended Proposal)
	solids) into the Integrated Waste Landform tailings cells.	

Decision:

Amendments to proposal as set out in attachment 1 is approved subject to additional functions. Refer to notice under s40(2)(a).

Environmental factors relevant to amendment(s):

- Inland Waters values: dewatering and re-injection of excess water via MAR and/or discharge to Lake Annean.
- Flora and Vegetation: clearing of vegetation and priority flora.
- Terrestrial Fauna: clearing of fauna habitat.
- Subterranean Fauna: dewatering and location of re-injection of excess water.

Summary of likely changes to environmental impacts from proposed amendment

The proposed amendments more accurately reflect updated hydrogeological modelling predictions. Key changes to the groundwater model include updated hydraulic conductivity, increased percentage of rainfall recharging the groundwater, and interflow through shallow soil profiles which results in increased recharge compared to the previous model. Excess water is proposed to be reinjected to the deep aquifer within the boundary of the MAR reinjection borefield and/or discharged via pipeline to Lake Annean.

Table 2: Amendments and changes to environmental impacts

Amendment sought	Changes to environmental impacts
Change in the development envelope: <ul style="list-style-type: none"> • 10,935 ha to 12,020 (increase of 1,085 ha [10%]) And disturbance footprint: <ul style="list-style-type: none"> • 3,806 ha to 2,657 ha (decrease of 1,149 ha [30%]) 	<p>Likely decreased impacts to:</p> <ul style="list-style-type: none"> - The area (ha) of vegetation to be cleared <p>Likely increased impacts to:</p> <ul style="list-style-type: none"> - Minor increase in potential impact to one additional Priority Four species within the mine development envelope. - Minor increase in area of potentially significant vegetation communities within development envelopes. The maximum potential increase of disturbance to locally significant vegetation types is 320 ha, which is approximately 12% increase compared to the original proposal. <p>Unknown impacts to the following aspects:</p> <ul style="list-style-type: none"> • A total of 47 ha of native vegetation and potential habitat is proposed to be cleared.

Amendment sought	Changes to environmental impacts
	<p>The EPA considers proposed changes do not alter the key environmental factors likely to be impacted by the original proposal. These changes to potential environmental impacts (including the Pipeline Corridor Development Envelope) will be considered further during the assessment.</p>
<p>Water Abstraction</p> <ul style="list-style-type: none"> Change from volume to reference to groundwater impact zones. 	<p>The extent of groundwater drawdown will be less than what was previously predicted for the original proposal.</p> <p>Likely decreased impacts to:</p> <ul style="list-style-type: none"> There will be a reduction in the extent and depth of groundwater drawdown, resulting in decreased area within complete, high and partial groundwater impact zones. There will be a decrease in impact on stygofauna habitat due to a decrease in extent of predicted groundwater drawdown. There will be a decrease in impacts to Priority Ecological Community Nowthanna Hill Calcrete. <p>No change in impact</p> <ul style="list-style-type: none"> No significant change to impact on troglofauna habitat. <p>The EPA advises that the potential impacts, and the pathways for those impacts, to each of the identified environmental factors remain unchanged.</p> <p>The EPA considers proposed changes do not alter the key environmental factors likely to be impacted by the original proposal. These impacts will be considered during the assessment.</p> <p>Not likely to increase potential for the proposal to be inconsistent with the EPA environmental factor objectives for Subterranean Fauna and Inland Waters.</p>
<p>Disposal of excess water</p> <ul style="list-style-type: none"> Reinjection of up to 4.4 GL/a water to the deep aquifer within the boundary of the reinjection Borefield and/or 	<p>The groundwater modelling undertaken to support the original proposal predicted dewater volume to be maximum of 3 GL/a. The dewater was to be used on site and the original proposal does not include any management of excess dewater.</p> <p>Due to the predicted higher volume of dewater, there will be excess dewater that cannot be used by the operations. The excess dewater is proposed to be either reinjected to the deep saline aquifer within the amended development envelope and/or discharged via pipeline to Lake Annean.</p>

Amendment sought	Changes to environmental impacts
<ul style="list-style-type: none"> Discharge of up to 2.6 GL/a via pipeline to Lake Annean <p>Therefore, a potential combined disposal of excess water of up to 7GL/a.</p>	<p>Likely increased impacts to:</p> <p><u>Reinjection to Deep Aquifer</u></p> <ul style="list-style-type: none"> The reinjection Borefield will be in the Hope Palaeodrainage main channel. Groundwater investigations to date indicate that the deep aquifer where the reinjection to occur is saline. The reinjection of brackish to hypersaline excess water into the deep aquifer is not anticipated to have a significant impact on the receiving environment. Further, modelled reinjection scenarios indicated that high salinity water propagated laterally within the deep aquifer, with limited vertical exchange within the lower portion of the lacustrine clay facies. High salinity water is not expected to invade the shallow aquifer under the increased pressure of reinjection to the deep aquifer. (Umwelt 2022). <p><u>Lake Annean</u></p> <ul style="list-style-type: none"> Lake Annean and its habitat are known to support some migratory birds. Groundwater data for Lake Annean indicates that it is a hypersaline system with recorded salinity levels ranging from 150,000 mg/L and 170,000 mg/L (PSM 2022). There may be discharge of up to 2.6 GL excess hypersaline to brackish water into lake. <p>The EPA considers proposed changes do not alter the key environmental factors (Inland Waters, Subterranean Fauna and Terrestrial Fauna) likely to be impacted by the original proposal. These impacts will be considered during the assessment.</p>

Summary of consultation

Table 1.1 of the s. 43A application provides a summary of the consultation between the proponent and EPA Services.

As the Referral Information with additional information required (ARI) under section 40(2)(a) has not been published, the s43A application, change in the proposal can be accommodated within the ARI which will be published (2 week public comment) on the EPA website. There are no changes to decision making authorities as part of the s43a application.

Summary of consideration of amendment

The EPA has considered, if the proposal were already approved, whether the amendment would be considered a significant amendment. This has included considering the likely significance of:

- Effects of the proposed amendment on its own.
- Effects of the proposed amendment in the context of the existing referred proposal.
- Cumulative environmental impacts.
- Holistic impacts.

The EPA has considered whether it has sufficient information about the proposed amendment to be able to reasonably proceed with assessment of the amended proposal with or without performing any additional functions at this stage. The EPA has considered whether the amended proposal will still be substantially the same character as the existing referred (original) proposal.

The existing referred proposal does not include discharge of excess water to the environment. The proponent identified that water was to be imported (via pipeline) from an existing mine in the local vicinity of the proposal.

The PSM (2022) conceptual hydrogeological model and subsequent numerical groundwater flow model have been updated based on additional site hydrogeological investigation and experience with paleo-drainage systems.

The re-injection of excess water to the deep Hope Paleo-drainage may result in potential environmental impact to the receiving environment. While the modelling and assessment provide some information on the potential impacts of the proposed amendments to Subterranean Fauna, there are complexities of the paleo-drainage and potential assumptions associated with the modelling. These aspects of the proposal would be covered under the Inland Waters factor which is an existing key preliminary factor for the assessment.

The EPA notes that since the issuing of the original ARI notice (28 April 2021), Social surroundings (Aboriginal heritage) matters have arisen for the proposal. These matters are not specific to the section 43A and are part of the assessment. The EPA's review of the Referral Information with additional information:

- may identify new preliminary environmental factors and/or other environmental factors and matters; and
- will consider whether the assessment has been carried out for environmental impacts in all areas which may be affected by the proposal's implementation.

Approval - subject to additional functions

The EPA considers the amended proposal to be substantially the same character as the existing referred proposal. The EPA considers that the amendment may be a significant

amendment if the proposal were already approved. The EPA considers it cannot reasonably proceed with assessment of the amended proposal unless it performs additional functions related to the amendments.

The additional functions which the EPA has decided to perform are Notice requiring information for assessment s. 40(2) (a) (Public comment).

Attachments

- Tables 3 and 4 Amended Proposal Content Document
- Figures 1.1 to 1.4 Proposal location, Development envelope and Disturbance footprint

Appeals: Decision not appealable.



Prof. Matthew Tonts

CHAIR

Delegate of the Environmental Protection Authority

Date: 15 July 2022

References

PSM. 2022. Australian Vanadium Limited: EIA Hydrological Study. PAM42155-022R Rev 1.

Umwelt. 2022. Australian Vanadium Limited: Mining and Beneficiation Operations. Request to amend proposal during assessment under s43A of the EP Act. April 2022.

Table 3: General proposal description

Proposal title	Australian Vanadium Project – Mining and Beneficiation Operations
Proponent name	Australian Vanadium Limited
Short description	The proposal is to mine and beneficiate vanadium ore to produce an enriched vanadium-iron concentrate. The proposal includes an open pit mine, crushing, milling, flotation, and magnetic separation (beneficiation) plant, waste rock and tailings storage, and support infrastructure, located 40 km south-southeast of Meekatharra.

Table 4: Proposal content elements

Proposal element	Location description /	Maximum extent, capacity or range
Physical elements		
Mine, Beneficiation and Associated Infrastructure	Figure 1.1	Clearing of no more than 1,940 ha of native vegetation within the 6,965 ha Mine Development Envelope
Access Road and Infrastructure Corridor	Figure 1.2	Clearing of no more than 670 ha of native vegetation within the 2,625 ha Infrastructure Corridor Development Envelope
Pipeline Corridor	Figure 1.3	Clearing of no more than 47 ha of native vegetation within the 2,430 ha Pipeline Corridor Development Envelope
Open Pits	Figure 1.1	The open pits cover a combined maximum surface area 350 ha within the Open Pits Disturbance Footprint. The maximum depth of the open pits is 250 mAHD.
Operational elements		
Groundwater Drawdown	Figure 1.4	Limit of groundwater drawdown (groundwater depth compared to baseline groundwater level prior to commencing groundwater abstraction) due to the proposal operations does not extend beyond: <ul style="list-style-type: none"> • More than 10 m of groundwater drawdown does not extend

Proposal element	Location description /	Maximum extent, capacity or range
		<p>outside of the High Groundwater Impact Zone</p> <ul style="list-style-type: none"> • Outside of the Partial Groundwater Impact Zone groundwater drawdown remains less than 2 m.
Reinjection to Groundwater	Figure 1.1	Reinjection of up to 4.4 GL/a water to the deep aquifer within the boundary of the reinjection borefield. Quality of the reinjected water may range from brackish to hypersaline.
Discharge of excess water to Lake Annean	Figure 1.1	Discharge of up to 2.6 GL/a of water to Lake Annean via pipeline. Quality of the discharged water may range from brackish to hypersaline.
Beneficiation Waste	Figure 1.1	Disposal of no more than 920,000 tpa of tailings solids into the Integrated Waste Landform tailings cells.
Proposal elements with greenhouse gas emissions		
Peak Annual Average:		
Scope 1	Mine Facility: 63,775 t CO ₂ e per annum	
Scope 2	Not Applicable	
Scope 3	Transport within WA and Processing Facility: 142,905 t CO ₂ e per annum	
Commissioning		
<i>Construction and commissioning will not exceed the physical and operational elements detailed above</i>		
Rehabilitation and Decommissioning		
<i>Rehabilitation and decommissioning will be undertaken in accordance with the Mine Closure Plan, which will be approved and administered by the Department of Mines, Industry Regulation and Safety.</i>		
Other elements which affect extent of effects on the environment		
Ore Production Rate	Target ore production rate during operations of 1.0-2.2 million tonnes per annum of target grade ore.	Should the ore production rate be significantly different than the target, the duration of proposal operations will vary accordingly.
Proposal time	Maximum project life	30 years, plus any periods of temporary cessation of operations, or any increase in proposal duration due to periods of low ore production volume.

Proposal element	Location description /	Maximum extent, capacity or range
	Construction and commissioning phase	2-3 years
	Operations phase	25 operational years for proposed open pits at design ore production rate. The number of operational years may increase if ore production volume per year is less than design. Operations phase excludes any unplanned periods of care and maintenance or other temporary cessation of operations
	Decommissioning phase	Estimated 2-3 years, with subsequent 10 years post-closure monitoring.

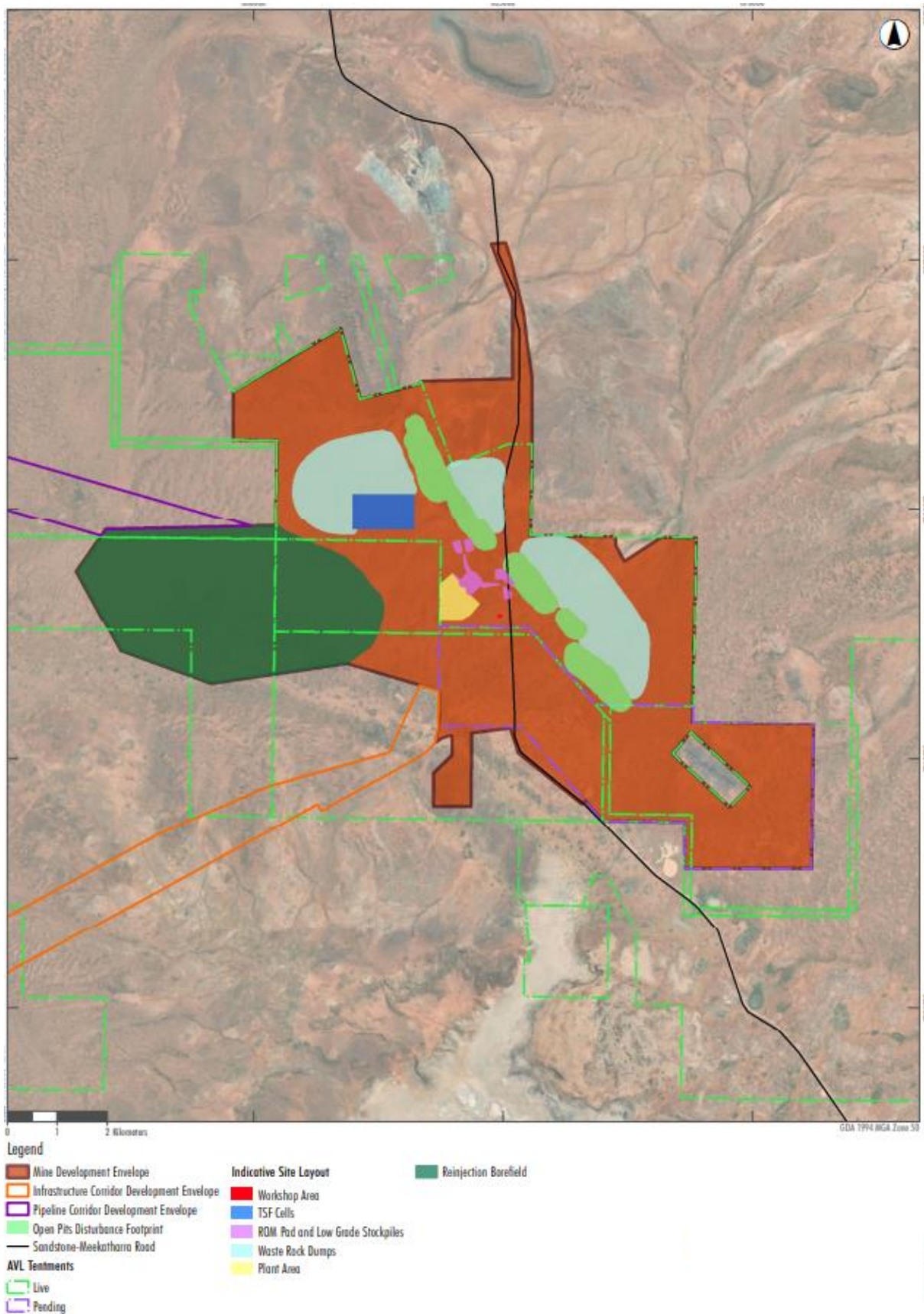


Figure 1.1 Proposed Development Envelope and Disturbance Footprint (Indicative Site Layout)

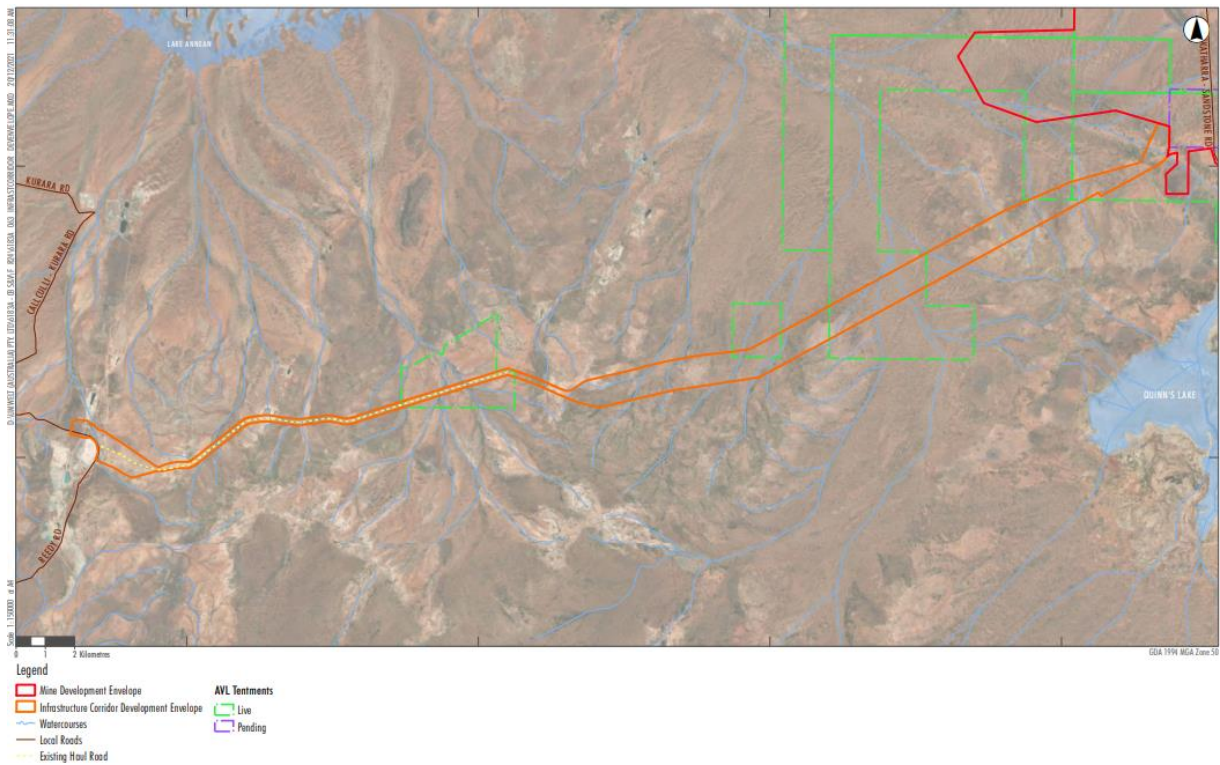


Figure 1.2 Infrastructure Corridor Development Envelope

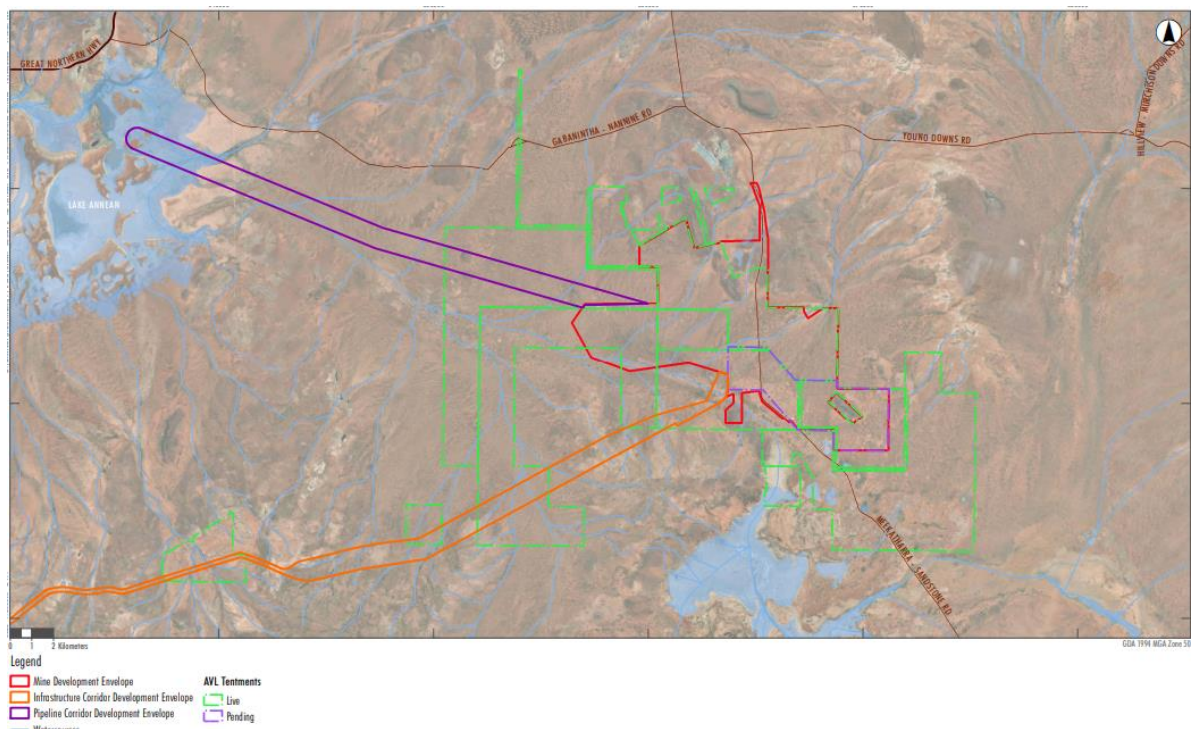


Figure 1.3 Pipeline Corridor Development Envelope

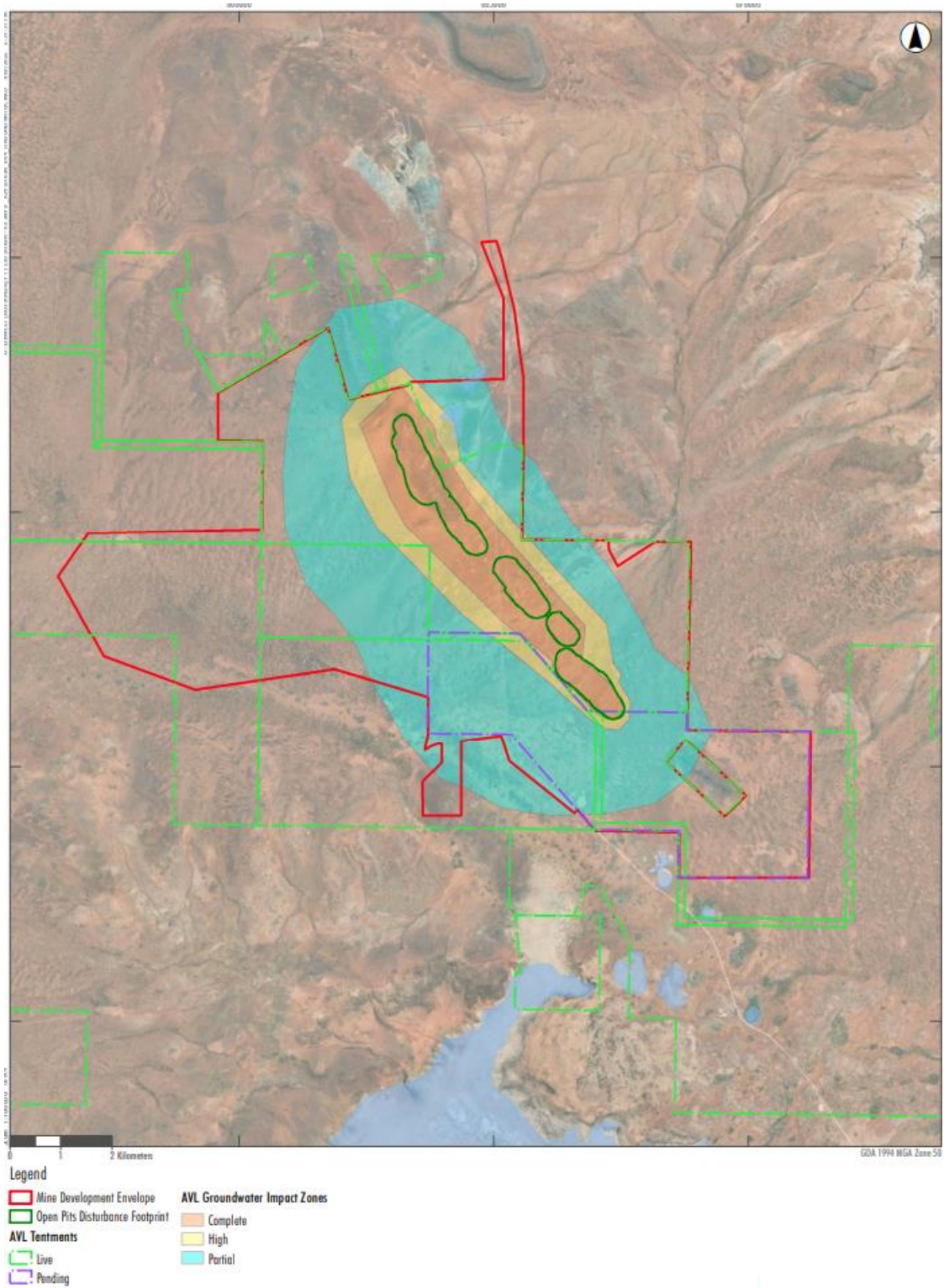


Figure 1.4 Groundwater Impact Zones