Government of Western Australia
Department of Water and Environmental Regulation

Decision Report

Application for Works Approval

Part V Division 3 of the *Environmental Protection Act 1986*

Works Approval Number	W6925/2024/1
Applicant	Develop Global Limited
ACN	122 180 205
File number	DER2024/000133
Premises	Pioneer Dome Lithium Project Part Mining Tenements M15/1896, L15/473 Higginsville, WA 6443 As defined by the premises map attached to the issued works approval
Date of report	4 October 2024
Decision	Works approval granted

Kang Tam
Digitally signed by Kang Tam
Date: 2024.10.04 11:40:12 +08'00'

A/MANAGER, RESOURCE INDUSTRIES
INDUSTRY REGULATION (STATEWIDE DELIVERY)
an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

Table of Contents

1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges during the construction and operation of the premises. As a result of this assessment, works approval W6925/2024/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary and overview of premises

On 26 March 2024, Develop Global Limited (the applicant) applied to DWER for a works approval under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is to undertake construction of an ore crushing plant (Category 5 – Processing of ore), construction of mine dewatering infrastructure and equipment (Category 6 – Mine dewatering), and the construction of a putrescible landfill (Category 64 – Class II or III putrescible landfill site) at the Pioneer Dome Lithium Project (the premises). The premises is approximately 25.8 km south of Widgiemooltha and 44 km north west of Norseman.

The following categories and design capacities have been applied for:

- Category 5 Processing of ore, design capacity of 1.5 million tonnes per annual (Mtpa) period;
- Category 6 Mine dewatering, design capacity of 300,000 tonnes per annual period; and
- Category 64 Class II putrescible landfill, design capacity of 1000 tonnes per annual period,

under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations), which are defined in works approval W6925/2024/1. The infrastructure and equipment relating to the premises categories and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020b) are outlined in works approval W6925/2024/1.

Once construction works, compliance certification and DWER sign-off has been completed, the operational aspects from the works approval may be transitioned onto a licence. The transition from works approval to a licence will be progressed via a separate licence application. During this transition period, time-limited operations is authorised under the works approval.

2.2.1 Overview of the premises

The premises will be mined for lithium (spodumene) ore at two deposits; Cade deposit and Davy deposit. The site has not previously been mined and currently the only existing infrastructure are three water exploration bores. The applicant estimates about a 7-year mine life at a steady rate of 1.5 Mtpa, totalling 11.2 Mt at 1.2% Li2O ore over the life of mine.

Spodumene ore is hosted in pegmatite veins, of which these veins are thin and ‘dip steeply’ to the east. The ore will be accessed from relatively shallow pit depths; 62 m for Cade Pit and 57 m for Davy Pit. Then, to allow for resource drilling and potential mining from underground, the applicant proposes to construct exploratory declines to a depth of 170 m for Cade Pit and 140 m for Davy Pit. Both ore deposits sit below the water table of 35 meters below ground level (mbgl) (300 mAHD) in high yielding fractured rock aquifers. Dewatering is requiring for safe

access for operations and exploration.

The applicant proposes to mine in two stages as follows:

- Stage 1: Open pit mining of two deposits, two waste rock landforms (WRL), a run-of-mine (ROM) pad, crushing/screening facilities and stockpiles, site access and interior haul roads, and haulage to a third party for processing and export. Estimated maximum production rate of 1.5 million tonnes per annum of (Mtpa). About 100 staff will be accommodated at existing offsite facilities. Completing stage 1 is the establishment of exploration declines within the two mine pits for investigation of resources at depth.
- Stage 2: Underground mine and potential extensions to onsite ore processing.

Currently, the applicant is applying for stage 1 only. Stage 2 may be applied for at a later date either as a works approval amendment or through a new works approval.

Bulk fuel will be stored at the premises, however, the total amount of fuel proposed to be stored is 600 cubic meters (m^3), which is below the 1000 m^3 threshold for Category 73 - bulk fuel, under Schedule 1 of the *EP Act*.

The site office will be serviced by a maximum 20 m^3 wastewater treatment plant and treated waste water will be discharged via a leach drain. This is below the threshold of more than 20 but less than 100 m^3 per day for Category 85 - Sewage facility, under Schedule 1 of the *EP Act*.

2.2.2 Overview of crushing and screening activities (Category 5)

Raw ore from the Cade and Davy pits will be stockpiled on the ROM pad for processing by a mobile rock breaker (crushing plant). The crushing plant is designed to process up to 1.5 Mtpa of ROM ore to produce crushed ore material suitable for transport and processing offsite. ROM ore will be tipped directly from haul trucks or reclaimed from the ROM pad by a front-end loader and fed to the ROM bin. The ROM bin will be fitted with a static grizzly to allow diversion of large rocks for breakage by a mobile rock breaker.

Dust from the crushing plant will be managed by suppression from water sprays at the ROM bin and at ore transfer points. Raw water will be sourced by the processes water dams.

Dust generated from haul roads will be managed via water carts spraying freshwater. Water will be sourced from onsite freshwater storage.

Sediment laden stormwater (stormwater) will be managed by containment via bunding and windrows around the ROM pad. Along the haul roads, stormwater will be captured by sediment ponds.

2.2.3 Overview of mine dewatering activities (Category 6)

Mine water and stormwater from the Cade and Davy pits and exploration declines will be pumped to turkeys nests near the pits for settling of coarse sediment, then transferred along 2.1 km of dewatering pipelines to two processing water dams within the workshop area.

Dewatering of both pits are expected to take about five months. Up to 300,00 tonnes per annum (0.3 GL pa) of water will be abstracted at an initial rate of about 7 L/s from each pit. Then depending on how permeable the weathered bedrock is, the rate will progressively increase up to between 9.5 L/s and 15 L/s. The applicant expects that at 9.5 L/s, dewatering discharge and operational water requirements will match.

In the event that the dewatering rate exceeds 9.5 L/s, the applicant may apply to amend the works approval to discharge excess water into the Karora water supply pipeline, located 3 km south of the Cade and Davy pits. The premises currently does not have the capacity to store or utilise more than 0.3 GL of raw water prior to the mill (processing plant) being constructed.

Saline water storage

Process overview:

The applicant is requesting approval to construct two turkeys nest dams constructed near each open mine pit (Cade Pit and Davey Pit) with an additional two lined processing dams to be constructed within the northeast corner of the workshop processing area.

The turkeys nest dams will receive mine dewater and stormwater for the purposes of settling out coarse sediment. The Cade & Davy Pit dams will each occupy footprints of 50 m x 50 m (0.25 hectares ha or 2,500 m^2). They will be lined with 1.5 mm HDPE liner to prevent seepage. From here, settled water will be pumped to two processing water dams.

The processing dams are 0.63 ha (6300 m^2) and 0.45 ha (4500 m^2) providing a combined capacity of 1.4 ha (14,000 m^2). These processing dams will be lined with 1.5 mm HDPE liner to prevent seepage. In addition to the settled water from dewatering activities, the processing dams will also receive:

- Concentrated reject (brine) from a reverse osmosis plant (RO). The applicant proposes to construct a RO plant which will process less than 20 m^3 per day of water sourced from groundwater separate from mine dewater for potable purposes. Potable water will be stored in a potable water tank located within the office and workshop area.

  Given that activity does not trigger Category 85B (under Schedule 1, Part 2 of the EP Regulations) and the saline nature of the dewater, the department has determined that this will not significantly impact the water quality within the processing water dams.

- Treated water from an oil water separator. The applicant is proposing to construct a refuelling facility at the premises where an oil water separator will be installed to treat any hydrocarbon contaminated wastewater from the facility. The refuelling facility will be constructed on a concrete hardstand, with the apron enclosed by low-drive over bunds with run-off directed to a sump of which the contents is pumped to the oil water separator. Treated oily water will be discharged into the processing dams. All waste oil and recovered oily water will be removed from the premises.

The treatment quality of the oil water separator and the reverse osmosis plant are as follows:

- The oil water separator is expected to treat water with an expected influent range up to 20,000 ppm of total petroleum hydrocarbons (TPH) and reduce TPH to effluent range of 100 ppm. The residual TPH will be diluted within the processing ponds; and
- Approximately 10 ML of brine will be produced per annum.

Water from the processing dams will be pumped to relevant areas as required such as for dust suppression, washdown, (unsealed) haul roads and landfill construction activities.

Automated level sensors will manage volumes and freeboards of all dams. When a dam is at capacity, water will be pumped to another water storage dam within the dewatering network. Operational freeboards will be maintained at 300 mm to prevent overtopping. Daily inspections will be carried out on active pipelines and dams containing water and not on inactive or empty dams.

Characteristics of mine dewater

The applicant has drilled three water exploration holes (PDW01-3) between 5 and 35 m below ground level and sampled them for water quality. Analysis of groundwater samples demonstrates that the groundwater quality is near-neutral and hyper-saline. Salinity increases with depth as demonstrated by shallow bore PDW01 (44,000 mg/L total dissolved solids (TDS), compared with deeper samples of PDW02 (64,000 mg/L) and PDW03 (66,000 mg/L). The applicant expects further increases in salinity, in excess of 100,000 mg/L, at greater depth within the fresh bedrock fracture zones. The water quality is shown in Table 1 below.

Table 1: Water quality data

Analyte	Units	PDW01_73m (28/9/23)	PDW02_73m (28/9/23)	PDW03_78m (28/9/23)
Total Dissolved Solids dried at 175-185°C	mg/L	44,000	64,000	66,000
pH	-	7.7	5.7	7.4
Conductivity @ 25 C	µS/cm	58,000	82,000	82,000
Bicarbonate Alkalinity as HCO_3	mg/L	300	5	210
Carbonate Alkalinity as CO_3		<5	<5	<5
Hydroxide Alkalinity as OH		<5	<5	<5
Total Alkalinity as $CaCO_3$		240	<5	170
Sulfate, SO4		23,000	37,000	35,000
Chloride, Cl		23,000	37,000	35,000
Calcium, Ca		540	1,300	860
Magnesium, Mg		1,500	2,500	2,300
Sodium, Na		1,2000	17,000	17,000
Potassium, K		210	270	310

The applicant states no modelling has been conducted to predict the final void water level and salinity. However, by comparison to other pits in the region, the rate of recovery for the standing water level is likely to be slow and stabilise at an elevation that is significantly lower than the regional water table. High evaporation rates will cause the salinity of the pit waters to rise. The pit will act as a groundwater sink, preventing flow of hyper-saline pit lake water into the surrounding rocks. However, it is noted that the surrounding water quality is naturally saline.

2.2.4 Overview of the inert and putrescible landfill

The applicant has applied for a class II putrescible landfill for not more than 1000 tonnes per annum (tpa).

The landfill will be located within the Cade WRL initially and then within the overburden that is deposited on the WRL. The landfill will likely be raised above the natural ground level which will prevent localised water flow from accessing the landfill. The trenches will be surrounded by windrows and bunding where appropriate, to prevent water inundation during rain events and the landfill access area will only have bunding installed to contain water, preventing runoff entering into the environment.

Waste proposed to be disposed of are as follows:

- Putrescible waste; and
- Inert waste type 1

The applicant initially applied for approval to dispose of use tyres (inert waste type 2) (up to 100 per annum) within the WRL, however they have confirmed that tyres no longer will be disposed

of within the WRL. This has therefore been removed from the scope of the assessment.

The landfill will comprise a series of trenches (one trench open at any one time) about 30 metres long, 10 metres wide and 4 metres deep. The applicant proposes to manage the facility in accordance with the *Environmental Protection (Rural Landfill) Regulations 2002*.

Until the works approval is granted, waste will be removed from the premises via licenced waste removal contractor for disposal.

2.3 Other Approvals

2.3.1 Mining Proposal

The applicant has applied for two Environmental Registrations with the Department of Energy, Mines, Industry Regulation and Safety (DEMIRS). The applicant submitted Mine Closure Plan version 3 (Reg ID: 93573) on 31 January 2021 which is under assessment and Stage 1 Open Pit Mining (Reg ID: 123643) on 20 March 2024; which is on hold, awaiting the proponent for further details. The applicant must ensure they have all relevant approvals for the Premises.

2.3.2 Native Vegetation Clearing Permit

On 22 March 2024, the applicant has applied for a clearing permit which is currently under assessment (CPS10520/1). The assessment is to clear up to 314 ha of native vegetation within a 1,440 ha portion of the premises, for the purposes of open pit mining. The applicant must ensure they have all relevant approvals for the Premises.

2.3.3 Heritage surveys

The applicant conducted heritage surveys between the 8 and 29 October 2023 at the premises in consultation with the Ngadju people. The surveys identified archaeological and ethnographic sites. The premises layout has been designed to avoid the majority of these sites. The applicant must be aware of its obligations to submit heritage survey results to the Registrar, under section 15 of the *Aboriginal Heritage Act 1972* (AHA).

3. Risk assessment

The department assesses the risks of emissions from prescribed premises and identifies the potential source, pathway and impact to receptors in accordance with the *Guideline: Risk Assessments* (DWER 2020b).

To establish a risk event there must be an emission, a receptor which may be exposed to that emission through an identified actual or likely pathway, and a potential adverse effect to the receptor from exposure to that emission.

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this decision report are detailed in Table 2 below.

Table 2 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 2: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
General			
Hydrocarbons	Hydraulic equipment failure and spills	Direct discharge & stormwater contamination	• The general provisions of the EP Act and Environmental Protection (Unauthorised Discharges) Regulations 2004 apply. • Chemicals, hydrocarbons and other environmentally hazardous materials will be stored and handled in accordance with the Dangerous Goods Safety Act 2004 and associated regulations, including use of a bunded and sealed assembly area for hazardous chemicals (containerised) prior to offsite treatment/disposal by a licenced and authorised waste contractor. • Bunding, containment and handling will be managed in accordance with the Australian Standard 1940-2004, Storage and Handling of Flammable and Combustible Liquids. • Facilities containing liquid chemical reagents (i.e., hydrocarbons and/or chemicals) will be stored within tanks in appropriately bunded facilities whereby 110% of the largest vessel is contained and 25% of the total volume is contained according to Australian Standards AS1940 and AS1692. • Self-bunded tanks will provide diesel for heavy and light vehicles. Natural gas, delivered to site via road tankers, will be stored in vacuum insulated vessels. Fuel storage facilities will include a fuel unloading system, access, lighting, and necessary safety systems. It is expected that up to 1ml of diesel may be stored onsite in self-bunded tanks. • The refuelling facility will include a concrete hardstand or HDPE-lined pads under potential spillage/drip points and a low drive-over bunded refuelling apron with runoff directed to a sump and oil water separator, will be constructed adjacent to the fuel storage. • Regular inspections of storage areas (i.e. fuel storage and refuelling areas, as well as vehicles and workshops) for

Emission	Sources	Potential pathways	Proposed controls
			leaking hydrocarbon bunds, pipes, drums or containers; • Spill kits will be located at strategic locations throughout the Project area and employees trained in their use; and • Spills will be cleaned up and contaminated soils will either be remediated or removed from site by a licenced third party. Incident investigation will be undertaken as required to determine the cause of environmentally harmful spills/leaks and control measures identified to prevent future incidents. As required, spills will be reported to the relevant authorities.
Construction			
Dust	Construction vehicle activities	Air/windborne pathway	• Dust suppression (via water cart) will be implemented; • Implement vehicle speed restrictions; and • Laydown and hardstand areas will be compacted.
	Construction of: • Crushing plant; • Class II putrescible landfill; • Two Turkeys Nests; and • Two processing water dams.		
Operation			
Category 5: Crushing plant			
Dust	Heavy haulage and light vehicle activities	Air/windborne pathway	• Dust suppression (via water cart) will be implemented; and • Speed limit of 60 km/h imposed on site roads; and • Vehicle traffic confined to defined roads and tracks.
	Operation of static grizzly and crushing circuit		• Dust suppression sprays will be installed at the primary crusher ROM bin; and • The crushing circuit will include water sprays to reduce dust at the ore

Emission	Sources	Potential pathways	Proposed controls
			transfer points at the crusher discharge. • Main conveyor with dust covers;
	Stockpiling activities on ROM		• Dust suppression (water cart) will be implemented.
Stormwater contamination (sediment) and seepage	Operation of static grizzly and crushing circuit / Stockpiling activities on ROM		• Storm water runoff will be contained within the ROM and workshop areas by means of bunding and windrows; and • Sediment traps or sumps will be constructed in strategic locations where water may have a tendency to pool or break away from bunds and containment structures.
Category 6: Mine dewatering			
Hyper-saline dewater	Failure of dewatering pipelines	Direct discharge to land	• Overland pipes will be installed within bunds with catchment sumps constructed at low elevation points as required to provide containment capacity in the case of a pipeline leak. • Isolation valves will be installed at appropriate intervals along pipelines. • Active pipelines will be inspected daily. Inspections will not be undertaken when facilities are not containing water and not active. • Spills will be cleaned up and contaminated soils will either be remediated or removed from site by a licenced third party. Incident investigation will be undertaken as required to determine the cause of environmentally harmful spills/leaks and control measures identified to prevent future incidents. As required, spills will be reported to the relevant authorities.
	Seepage from base of water storage dams and settling pond/dam	Direct discharge to land	• HDPE lined turkeys nest dams will be constructed near each open pit (Cade Pit and Davey Pit) with an additional two lined processing dams to be constructed within the workshop processing area.
	Overtopping of water storage dams and settling pond/dam	Direct discharge from overtopping of the receiving	• Dam volumes will be managed by automated level sensors and pumping capacity to either relocate water to alternative holding facilities within the

Emission	Sources	Potential pathways	Proposed controls
		dam	dewatering network; and • Freeboard will be maintained by automated level sensors and pump arrangements to manage water levels within the set parameters to maintain freeboard and prevent an uncontrolled spill or discharge of water.
	Use of mine dewater for dust suppression	Direct discharge to land / overspray onto vegetation	• Saline and hyper-saline water will only be used for dust suppression on haul roads, work areas, mine areas and waste facilities; and • Dribble bars instead of water sprays will be used on connecting haul roads for dust suppression where overspray may pose a risk to vegetation nearby road edges.
Category: 64 Putrescible Landfill and tyre storage			
Dust	Unloading of waste material onto the landfill / covering of waste	Air/windborne pathway	• Dust suppression (water cart) will be implemented.
Windblown waste	Disposal of class II waste into landfill	Air/windborne pathway	• Landfill waste will be covered monthly with crushed oxide overburden (waste); • Windblown rubbish will be managed by minimising open trench space by directing users to a specific access point of the waste trench to dispose waste; • Waste will be compacted where possible, covered with crushed waste on a regular basis to prevent windblown rubbish; • The facility will be inspected weekly to ensure trenches are safe, feral animal issues are managed and windblown rubbish is collected; and • The landfill will be inspected no less than once a week when operational and once a month during suspended, non-active or care in maintenance operations, unless the landfill is covered and considered not in use.
Leachate contaminated stormwater		Surface water runoff	• The landfill on the WRL will have appropriate windrows and bunds installed around the landfill trench to prevent water inundation into the

Emission	Sources	Potential pathways	Proposed controls
			trench during rain events; and • Bunding will also be placed around the landfill access area to contain water within the landfill access area to prevent runoff away from the landfill access area into the environment.
		Infiltration	• The landfill will be located on the Cade WRL and is expected to be raised above the natural ground level which will protect and prevent localised water flow from accessing the landfill.
Smoke	Class II waste into landfill and inert waste of type 2 (tyres)	Air/windborne	• Site induction will include information on the prevention and management of fires; • Firefighting equipment will be located on site and in all mine vehicles and personnel will be trained in fire response; • The applicant prefers to remove heavy vehicle tyres from site by a licenced waste contractor; • Only tyres which cannot be recycled or returned may be buried; • Landfill waste will be covered monthly with crushed oxide overburden (waste); • Waste will be compacted where possible, covered with crushed waste on a regular basis; • The landfill will be inspected no less than once a week when operational and once a month during suspended, non-active or care in maintenance operations, unless the landfill is covered and considered not in use; and • Heavy and light vehicle tyres when disposed of will be in accordance with Environmental Protection Regulations 1987 – REG14 disposal of tyres permitted means.

3.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020b), the Delegated Officer has excluded the applicant's employees, visitors, and contractors from its assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 3 below provides a summary of potential human and environmental receptors that may be impacted as a result of activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental Siting* (DWER 2020a)).

Table 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
-	*No human receptors within 10 km.*
Environmental receptors	**Distance from prescribed activity**
Aboriginal and other heritage sites	About 9.4 km west of the mining tenement, 12.9 km west of Davy Pit, 13.8 km west of the processing plant, and 14.6 km west of the landfill. Numerous archaeological and ethnographical sites have been identified within the premises boundary to avoid.

Fauna of conservation significance	There are 7 terrestrial vertebrate fauna species of conservation significance assessed for their likelihood to be present within the premises boundary. Of these 2 are possible, 3 unlikely and 2 would not occur.
	4 are threatened and 2 migratory or otherwise protected species.
	• Possible at the premises:
	  ○ *Falco hypoleucos* (grey falcon) – vulnerable under the EPBC and BC Acts; and
	  ○ *Leipoa ocellata* (Malleefowl) – vulnerable under the EPBC and BC Acts and as Fauna That Is Rare Or Is Likely To Become Extinct in Western Australia (DCCEEW, 2021).
	• Occurs regionally but unlikely to occur at the premises.
	  ○ *Dasyurus geoffroii* – chuditch – Vulnerable under the EPBC Act.
	A EPBC report also shows the following listed migratory species likelihood to occur within the premises / in the regional area:
	• The species or species habitat may occur in the premises area:
	  ○ *Actitis hypoleucos* - common sandpiper - migratory wetland species; and
	  ○ *Calidris melanotos* – Pectoral Sandpiper.
	• The species or species habitat are likely to occur at the premises:
	  ○ *Calidris acuminata* – Sharp-tailed Sandpiper.

Fauna habitat	There are 4 fauna habitats within the premises boundary suitable for the grey falcon and malleefowl above as follows:
	• Suitable habitat for grey falcon and Malleefowl:
	  ○ Eucalyptus woodland on clay-loam plain
	• Suitable habitat for Malleefowl:
	  ○ Eucalyptus low mallee woodland on granite outcrop
	  ○ Eucalyptus woodland on rocky hillslope
	  ○ Acacia shrubland on sandy clay loam plain.
	Habitats suitable for Malleefowl completely overlaps with the premises boundary, while habitat suitable for the grey falcon overlaps the majority of the premises.

Native vegetation	All the which overlap the premises retain >96% of their pre-European extent. The main vegetation association is the Binneringe (8, 128, 522 and 1413) with the following vegetation groups: • Eucalyptus open woodland; • Eucalyptus Malee woodland; and • Acacia shrubland. The development area of the premises mostly sits within the Eucalyptus woodland on clay-loam plain. The vegetation condition within the premises has been determined to be very good to good.
Flora of conservation significance	There are 48 flora of conservation significance assessed for their likelihood to be present within the survey area (premises boundary). Of these, one has been previously recorded, 10 are possible and 37 are unlikely. The previously recorded species is as follows: • Priority 3 – *Eremophila acutifolia* – Within the premises boundary. The Priority 3 species *Eremophila acutifolia* was recorded within eight quadrats of the premises boundary. The quadrats are in relation to infrastructure at the premises as follows: • Two quadrats are about 1 km south east of the processing ponds; • Two quadrats are about 2.4 and 2.5 km south west and west of the Davy Pit turkeys nest dam; • One quadrat is about 1.8 km north west; • One quadrat is about 0.9 km north east of the Davy Pit turkeys nest and north west of the Cade turkeys nest dam. The remaining two quadrats are about 1.5 to 2 km east of the Premises boundary; 3km north east of the Cade turkeys nest dam.
Surface water	Multiple minor ephemeral drainage lines intersect the premises, generally they flow north in response to rainwater events. They converge to a single creek which flows between Davy pit (about 350 m southeast from the turkeys nest), the processing plant area (about 410 m northwest) and the Cade Pit turkeys nest (about 700 m west).

Groundwater	The Premises is location upon the northern margin of Pioneer Dome, which has intruded mafic and ultramafic volcanic rocks, and clastic metasedimentary rocks, within the western margin of the Norsemen-Wiluna greenstone belt. The applicant has identified “significant mineralised pegmatite veins… at the Heller, Davy and Cade deposits. The deposits transition from being predominantly hosted in mafic rock in the west, to being predominantly hosted in metasediment in the east. The Cade pegmatite appears to have smaller faults.” Three types of fractured rock aquifers are likely to exist at the Pioneer lithium deposits. These are: 1) fracture zones at the base of the weathering profile and within the top of fresh bedrock; 2) fracture zones at the pegmatite contacts; and 3) fracture zones associated with major northwest-striking structures and smaller, northwest-striking structures that link them. The proposed Cade and Davy pits will intersect and receive inflows from the weathered bedrock aquifer, which is assessed to have a permeability of about 0.25 m/d. The standing water level is about 35 m below groundwater level.

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020b) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 3.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the applicant has proposed mitigation measures/controls (as detailed in Section 3.1), these have been considered when determining the final risk rating. Where the delegated officer considers the applicant's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the applicant's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

Works approval W6925/2024/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 4 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. Category 5, 6 and 64 activities. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses the licence application.

Table 4: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
General activities								
Hydraulic equipment failure and spills	Hydrocarbons	*Pathway:* Direct discharge *Impacts:* Contamination of soil / rootzone and Surface water lines and groundwater	Fauna habitat Native vegetation Surface water	Refer to section 3.1.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	N/A *Environmental Protection (Unauthorised discharge) Regulations 2004* apply
Construction								
Movement of heavy vehicles along haul roads Construction of ROM pad Installation of crushing and screening plant Construction of saline water storage dams and installation of dewatering pipelines and associated dewatering infrastructure Construction of surface water management infrastructure Construction of landfill	Dust	*Pathway:* Air/windborne *Impacts:* Smothering of vegetation	Fauna habitat Native vegetation containing flora of conservation significance Surface water	Refer to section 3.1.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	N/A

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Time-limited Operations								
Category 5: Crushing Plant								
Heavy haulage and light vehicle activities Operation of static grizzly and crushing circuit Stockpiling activities on ROM	Dust	*Pathway:* Air/windborne *Impacts:* Smothering of vegetation & reduction	Fauna habitat Native vegetation with flora of conservation significance Surface water	Refer to section 3.1.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1	Condition 1 – Installation of dust suppression measures.
	Stormwater laden contamination	*Pathways*: Surface water runoff and infiltration *Impact:* Contamination of ephemeral Surface water lines, vegetation death, groundwater	Aboriginal and other heritage sites Fauna habitat Native vegetation with flora of conservation significance Surface water	Refer to section 3.1.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1	Condition 1 – Requirement to construct bunding around the ROM to contain stormwater.
Category 6: Mine Dewatering								
Pipeline failure (leaks and bursts)	Hyper-saline dewater	*Pathway:* Direct discharge over land from pipeline failure *Impact:* Impact to heritage sites; vegetation death	Aboriginal and other heritage sites Fauna habitat Native vegetation	Refer to section 3.1.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1 and 6	Condition 1 – Installation of flow containment measures. Condition 6 – Implementation of daily inspections of active pipelines for integrity.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
			with flora of conservation significance Surface water					
Seepage of saline water storage (turkeys nest and process dams)		*Pathway:* Seepage / percolation *Impact:* Impact to heritage sites; vegetation death	Aboriginal and other heritage sites Fauna habitat Native vegetation Surface water	Refer to section 3.1.1	C = Slight L = Unlikely **Low Risk**	Y	Condition 1 and 6	Condition 1 - Installation of 1.5 mm HDPE liner Condition 6 - Operational requirements imposed including; maintenance of sensors and visual inspection.
Overtopping of saline water storage (turkeys nest and process dams)		*Pathway:* Direct discharge to land *Impact:* Impact to heritage sites; vegetation death	Aboriginal and other heritage sites Fauna habitat Native vegetation Surface water	Refer to section 3.1.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1 and 6	Condition 1 -Installation of automated level sensors and pumping capacity to transfer water to another saline water storage dam on the network. Condition 6 - Operational requirements imposed including a standard freeboard of 300 mm; maintenance of sensors and visual inspection.
Use of mine dewater for dust suppression		*Pathway:* Direct discharge to land / overspray onto vegetation *Impact:* Vegetation stress/death	Fauna habitat Native vegetation Flora of conservation significance Surface water	Refer to section 3.1.1	C = Minor L = Unlikely **Medium Risk**	N	Condition 6 and **7**	Condition 6 – specifies that water from the process dams can be used for dust suppression activities. **Condition 7** – DWER imposes water used for suppression is to be applied in a manner that does not impact native vegetation or the environment.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Category: 64 Putrescible Landfill								
Unloading of waste material onto the landfill and tyre storage / covering of waste	Dust	*Pathway:* Air/windborne *Impacts:* Smothering of vegetation & reduction of air quality	Fauna habitat Native vegetation	Refer to section 3.1.1	C = Slight L = Unlikely **Low Risk**	Y	Condition 6	Category 6 - Implementation of dust suppression as an operational control.
Disposal of class II waste into landfill	Windblown waste	*Pathways:* Air / windborne *Impact:* Smothering of vegetation, reduced amenity, ecosystem disturbance with the attraction of native and feral animals	Aboriginal and other heritage sites Fauna of conservation significance Fauna habitat Native vegetation Surface water	Refer to section 3.1.1	C = Slight L = Unlikely **Low Risk**	Y	Condition 1 and 6	Condition 6 – Cover requirements and inspections
	Leachate contaminated stormwater	*Pathways*: Over land surface water run-off *Impact:* Contamination of surface water lines, reduction of vegetation health or death	Aboriginal and other heritage sites Fauna habitat Native vegetation Flora of conservation significance Surface water	Refer to section 3.1.1	C = Minor L = Unlikely **Medium Risk**	N	Condition **1** and 6	Condition 1 – Landfill trench and access area surrounded by bunding and windrows. **Landfill located outside of PAF encapsulation cell within WRL**. Condition 6 – Cover requirements
		Pathways: Infiltration through soil *Impact:* Contamination of groundwater	Groundwater	Refer to section 3.1.1	C = Slight L = Unlikely **Low Risk**	Y	Condition 1	Condition 1 – Landfill located above ground level within the Cade WRL

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the *Guideline: Risk Assessments* (DWER 2020b).

Note 2: Proposed applicant controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

Works Approval: W6925/2024/1

4. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 10 June 2024	On 18 June 2024, Dennis Marinovich from CTS Tyre Recycling expressed concerns about the applicant burying 'non-recyclable' tyres at the premises, when his company have capacity to buy the tyres and recycle them.	On 24 of July 2024, the department replied to Dennis Marinovich from CTS Tyre Recycling advising them to contact the applicant as the department does not facilitate these interactions.
Shire of Coolgardie advised of proposal on 26 July 2024	No comment received.	N/A
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal 26 July 2024	Refer to Appendix 1	Refer to Appendix 1
Department of Planning, Land and Heritage (DPLH) advised of proposal on 26 July 2024	Refer to Appendix 1	Refer to Appendix 1
Ngadju Native Title Aboriginal Corporation advised of proposal on 13 August 2024	No comment received.	N/A
Applicant was provided with draft documents on 30 September 2024.	The applicant provided the information requested by the department.	Information provided included in the Decision Report and works approval.

5. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020a, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020b, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Department of Climate Change, Energy, the Environment and Water 2021, *National recovery plan for Malleefowl (Leipoa ocellata)*, Canberra, Australian Capital Territory.
5. DEVELOP 2024, *Works Approval Application*, West Leederville, Western Australia, 6901.

Appendix 1: Summary of stakeholder's comments on application

Consultation method	Comments received	Department's response
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal 26 July 2024	On 7 August 2024, DEMIRS provided the following response: In response to the request for comment regarding an application from Develop Global Limited for a works approval under Division 3 Part V of the Environmental Protection Act 1986 at the Pioneer Dome Lithium Project within Mining Tenements M15/1896, L15/473, Higginsville. In relation to; Category 5 – Processing of Ore Category 6 – Mine dewatering and Category 64 – Class II putrescible landfill and inert landfill (for inert waste type I & type 2 (tyres). The Mining Proposal (MP) application is currently "on hold" pending further information from the proponent, specifically around mine closure planning and grant of tenure (L15/473). Please see comments below regarding containment infrastructure and discharges in relation to the MP. <u>Category 64 – Class II putrescible landfill & inert landfill (for inert waste type 1 and type 2 tyres)</u> The Cade Waste Rock Landform (WRL) will have a PAF encapsulation cell, tyre disposal is not permitted within this PAF cell. DEMIRS recommends tyre disposal is restricted to the Davy WRL which does not have a PAF encapsulation cell. <u>Category 6 – Mine Dewatering</u> Dewatering of the Cade and Davy pits is modelled to progressively increase from 7 to 15 L/s which appears to align with initial water supply requirements of 0.3 GL/a (9.5L/s) for mining, the indicative plan in the event the site encounters excess dewater is to utilise the water supply pipeline form Chalice Pit to Higginsville which runs 3 km south of the Cade and Davy deposits with the approval of Karora Resources. Approval from Karora Resources to utilise the pipeline from Chalice Pit has not been confirmed, in the event that the site has excess dewater without the option of the pipeline to Higginsville where is the water going to be contained, the MP has provision for two water storage dams indicated as saline water/process liquor to be established within the process and workshop facility area.	DWER notes that the MP application is on hold. The applicant initially applied for approval to dispose of use tyres (up to 100 per annum) within the Cade WRL, however they have since confirmed that tyres no longer will be disposed of within the WRL. This has therefore not been included within the scope of the works approval. If the applicant wishes to dispose of tyres within the WRL in the future a separate approval will need to be applied for. Section 2.3.1 reminds the applicant they have all relevant approvals for the Premises.

Consultation method	Comments received	Department's response
Department of Planning, Land and Heritage (DPLH) advised of proposal on 26 July 2024	On 8 August 2024, DPLH provided the following response: A review of the Register of Places and Objects, as well as the DPLH Aboriginal Heritage Database, concludes that the subject area as described in the shapefile 'W6925 Pioneer Dome Lithium Project_GIS_Premises boundary' provided does not intersect with any known Aboriginal heritage Places or Registered Sites. Therefore, based on the current information held by DPLH, no approvals under the Aboriginal Heritage Act 1972 (AHA) are required in this instance. Please note that no Aboriginal heritage surveys have been completed over the subject land and, as such, it is unknown if there is Aboriginal cultural heritage present. Therefore, Develop Global Limited needs to be made aware of its obligations under the AHA. DPLH also advises Develop Global Limited regularly checks ACHIS should new Aboriginal Cultural Heritage be reported within the subject area. You can search ACHIS by using the following link: https://espatial.dplh.wa.gov.au/ACHIS/index.html?viewer=ACHIS.	DWER notes no heritage approvals are currently required. The applicant has conducted heritage surveys and so DWER suggests the results of the surveys are provided to DPLH. DWER reminds the applicant of their obligations under section 2.3.3.

Appendix 2: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of applicant's comment	Department's response
Decision Report		
Section 2.2.1 1. Applicant to provide missing details above.	The applicant estimates about a **7**-year mine life at a steady rate of **1.5 Mtpa**…	DWER has updated the Decision Report text to include the information provided.
Section 2.2.3 2. Applicant to provide pipeline construction details.	… then transferred along **2.1 km** of dewatering pipelines …	
Section 2.2.3 Saline water storage 3. Applicant to provide the footprint areas of each of the turkeys nest dams for the Cade and Davey pits.	The dams will occupy footprints of **50 m x 50 m (0.25 hectares ha or 2500 m^2)**. The applicant also provided the dimensions for the processing dams: **0.63ha (6300 m^2)** and **0.45 ha (4500 m^2)**.	
Section 2.2.3 The treatment quality of the oil water separator and the reverse osmosis plant are as follows: 4. Provide amount of brine production expected from the RO plant and dilution ratio of brine to dam water volume.	• The oil water separator is expected to treat water with an expected influent range up to **20,000 ppm** of total petroleum hydrocarbons (TPH) and reduce TPH to effluent range of **100 ppm**; and • Approximately **10,000 kl** of brine will be produced per annum.	DWER has updated the Decision Report text to include the information provided. Measurement of 10,000 kL converted to 10 ML.
Section 2.2.3 5. Applicant to confirm whether treated water from an oily water separator servicing the workshop and or washdown bays contribute to process water input? If so, provide the treatment quality from treated oily water and if possible, the dilution ratio in the processing dams.	Treated water will go to the processing dams. All waste oil and recovered oily water will be removed from site.	DWER has updated the Decision Report text to include the information provided. The department notes that the dilution ratio can be inferred from the information provided from questions 3 and 4 and is sufficient to inform the risk assessment.

Condition	Summary of applicant's comment	Department's response
Decision Report		
Section 2.3.3 7. Applicant to provide dates the heritage surveys were conducted.	Heritage Surveys were conducted between the **8th and 29th of October 2023**.	DWER has updated the Decision Report text to include the information provided.
Section 3.1.2 Receptors 8. Applicant to clarify what the cleared and non-cleared areas on the Archaeological surveys figure means. Have any sites been removed?	This refers to survey clearing status. A green area labelled with a status as cleared indicates the area has been heritage surveyed and does not need further surveys to be conducted to clear or approve it for access by Develop and that all identified features have been noted. Areas labelled not cleared will require further surveys or the native title holders does not want any access or further surveys to be undertaken in the area and is considered a restricted area until further clearance surveys can be obtained.	Noted.
Works Approval		
Condition 1, Table 1 (Item 2, 3, and 4) Applicant to provide construction figures.	Applicant updated Figure 1 with inserts of the turkeys nest and pipeline bunding design/arrangement. The figure now also shows the indicative location of the Cade and Davy pits and clarifies the location of the processing dams.	Table 1, Infrastructure location column text for items 2, 3 and 4 reads "As depicted in Schedule 1, Figure 1" Figure 1 updated in Schedule 1.
Schedule 1 Premises Maps Applicant to provide as designed construction figures/diagrams of items of infrastructure listed in Table 1		