Application for Works Approval

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

Works Approval Number	W2874/2025/1
Applicant	Doral Fused Materials Pty Ltd
ACN	009 415 025
Application number	APP-0026362
Premises	Doral Fused Materials 1 Alumina Road EAST ROCKINGHAM WA 6168
Date of report	20 August 2025
Decision	Draft for applicant representations

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 W2874/2025/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this report, the department 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

On 12 November 2024, Doral Fused Materials Pty Ltd (the applicant) submitted an application for a works approval to undertake construction works relating to the production of cobalt sulphate and the refining of nickel at 1 Alumina Road, East Rockingham (the premises).

The premises relates to the categories and assessed design capacity under Schedule 1 of the Environmental Protection Regulations 1987 (EP Regulations) which are defined in works approval W2874/2025/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W2875/2025/1.

2.3 Overview of premises

The premises is subject to an existing licence L5908/1990/12 for mineral sands processing, metal smelting or refining and screening of material.

The proposed additions are the construction and operation of a plant to produce cobalt sulphate and the electrowinning of nickel, with an option for electrowinning of cobalt, depending on market conditions.

The feed for the plant will be mixed hydroxide and mixed sulphide precipitates, delivered to site in 1 tonne bulka bags. Bulka bags are discharged into a hopper where the feedstock is distributed to reactors. The product is then acid leached and oxidation leached in reactor vessels, prior to being filtered.

The filtrate is transferred to a series of reactors for manganese oxidation. Trace metals are removed with an anionic resin followed by a cathodic resin; cobalt and nickel are then separated by solvent extraction. The cobalt-rich organic phase is stripped with sulphuric acid and the stripped cobalt sulphate solution is precipitated by addition of isopropanol. Dried crystals are packaged in 1 tonne bulka bags and any spillage will be washed to a sump and returned to the process.

Nickel is electrowon from the nickel chloride remaining in the raffinate.

A refinery block flow diagram is shown in Figure 1.

The premises will include the installation of a lime scrubber stack to reduce the emissions of acid gases. Residues (including empty bulka bags) from processing circuit are expected to meet criteria for disposal at general waste (Class II or Class III) landfill facility.

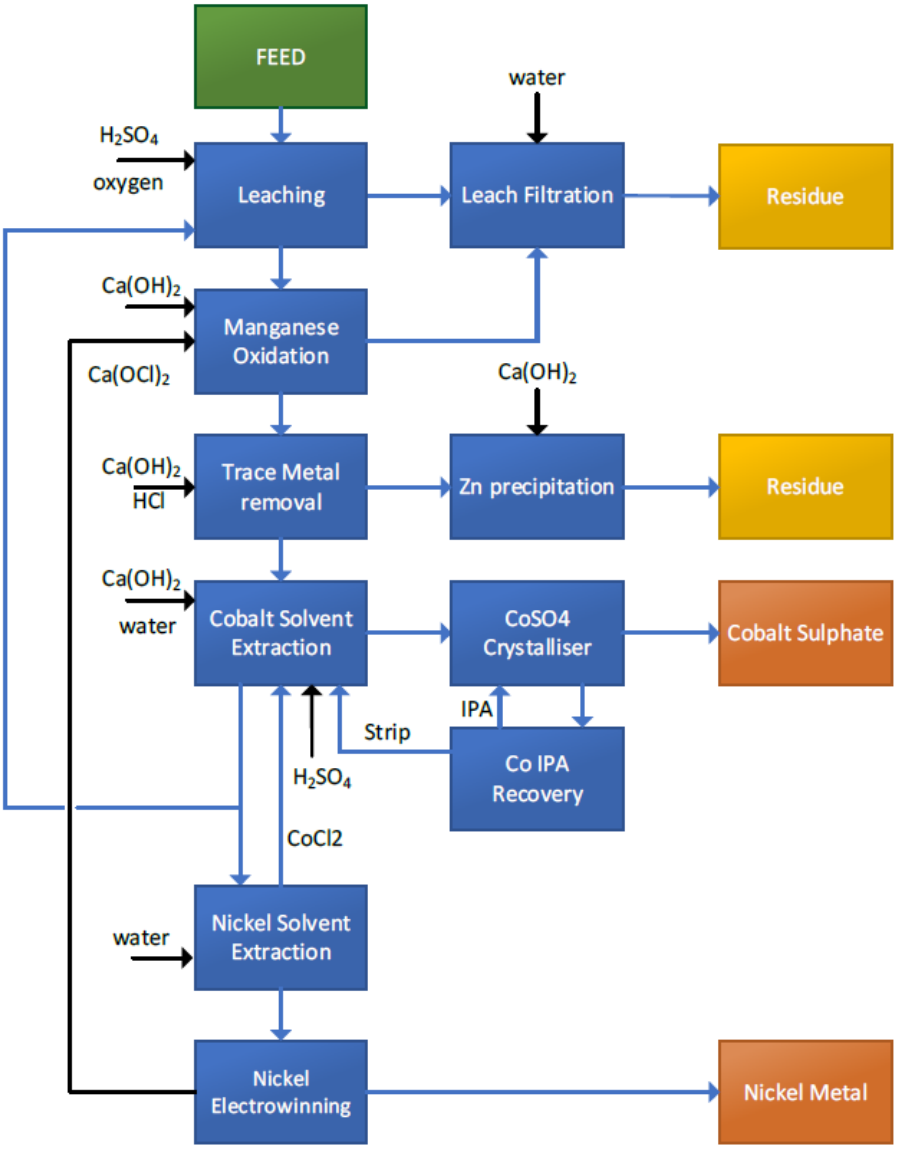

Figure 1: Block flow diagram

3. Emissions modelling

3.1 Air emissions

3.1.1 Modelling of emissions to air

An air quality emissions assessment was submitted with the application and after discussion a revised *Works Approval Air Quality Emissions Impact Assessment of Proposed Cobalt-Nickel* was submitted to DWER on 3 July 2025.

Meteorological configurations were generated using Calmet and Ground Level Concentrations (GLC) were modelled using Calpuff dispersion model. Local commercial premises; Bunnings, Mazda, Hyundai and Mitsubishi were included in the sensitive receptor assessment. The nearest residential receptor was at West Cee and Sea Caravan Park.

The predicted peak ground level concentration of various emissions from the whole premises are shown in Table 1.

Table 1: Predicted peak ground level concentrations of emissions

Substance	Averaging Period	Ambient exposure limit, µg/m³	Premises Boundary		Industrial Receptors		Sensitive Receptors	
			Peak at ground level µg/m³	Percent of guideline	Peak at ground level µg/m³	Percent of guideline	Peak at ground level µg/m³	Percent of guideline
TSP	24 hour	90	6.46	7.17	4.96	5.51	0.65	0.72
PM_{10}	24 hour	50	6.46	12.93	4.97	9.94	0.66	1.32
	Annual	25	0.79	3.15	0.47	1.88	0.04	0.16
$PM_{2.5}$	24 hour	20	6.46	32.28	4.97	24.85	0.66	3.28
	Annual	7	0.79	11.26	0.47	6.71	0.04	0.57
SO_2	1 hour	215	1.08	0.50	1.00	0.46	0.75	0.35
	24 hour	57	0.82	1.43	0.42	0.74	0.13	0.23
	Annual	52	0.10	0.20	0.04	0.08	0.01	0.01
NOx	1 hour	164	10.69	6.52	9.90	6.04	7.47	4.56
	Annual	28	1.04	3.67	0.40	1.43	0.07	0.26
CO	15 minutes	100,000	6.90	0.01	6.39	0.01	4.83	0.00
	1 hour	30,000	5.23	0.02	4.84	0.02	3.66	0.01
	8 hour	10,000	4.75	0.05	3.54	0.04	1.44	0.01
NH_3	1 hour	330	13.05	4.09	12.50	3.79	9.45	2.86
HCl	1 hour	140	12.27	8.76	9.28	6.63	2.76	1.97

All key pollutant maximum mass emission rates were predicted to have ground level concentrations well below the ambient air exposure guidelines. Cumulative values were also considered and found to comply except for PM_{10} and $PM_{2.5}$ where the combined airshed already has exceedance of the air quality limits but the premises contribution are well below the ambient guidelines.

3.1.2 DWER technical review

The department reviewed the modelling and found that in general the revised air quality assessment meets the requirements of its *Air Quality Modelling Guidance Notes*.

It is noted the proponent did not include cobalt, nickel and other metal emissions in the assessment. The internal review recommended the applicant confirm that metals are not an emission of concern.

4. Consultation

The application was referred to relevant public authorities and advertised for public comment on the department's website during February 2025.

The City of Rockingham and the Kwinana Industrial Council did not provide a response, nor were any public submissions received, within the timeframe specified.

5. 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 2020).

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.

5.1 Source-pathways and receptors

5.1.1 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
Construction			
Dust	Clearing of vegetation, site preparation works and construction of buildings. Vehicle movements	Air / windborne pathway	Surface stabilisation in locations where dust emissions are likely to occur. Traffic speed restriction on site. Use of water sprays Watering roadways or preparing roadway with coarse gravel or other road coverings such as asphalt or concrete During site clearing all vehicles shall ensure that they Arlean on entry and exit of the site.
Noise	Machinery used during clearing and construction.	Air / windborne pathway	Construction work will be undertaken in standard hours. Equipment will meet relevant noise attenuation requirements.
Operation			
Noise	Compressors, vacuum pump and other processing equipment	Air / windborne pathway	Equipment noise attenuation (covers)
Acid Gas	Leaching and treatment of product with acids	Air / windborne pathway	Lime scrubber Existing site emission limits.
Fugitive dust	Handling of feedstock, reagents and product.	Air / windborne pathway	During operations, material handling will occur within the shed in designated loading/unloading bays. Feedstock bags will be opened within an enclosed hopper connected to the lime scrubber. Filling of product bags will be within a sealed chute connected to the lime scrubber. Leach residue/filter cake collected in the skip bin will have 5 – 10% moisture (moist).

Emission	Sources	Potential pathways	Proposed controls
Odour	Reagent storage and reactor vessels	Air / windborne pathway	Reagent storage to be sealed and connected to lime scrubber Reactor vessels connected to lime scrubber. Carbon filter scrubber on solvent extraction area.
Stormwater and surface water	Off roof and yard stormwater coming into contact with leaks or spills	Direct discharge	Feedstock will be delivered to site in sealed shipping containers and placed onto hardstand area. Acid and Lime stored within bunded area. Other reagents stored within the hardstand area and on suitable portable pallet bunds. Spill kits located within the operating area. Hardstand area will direct stormwater to existing sumps within the Premise boundary. Materials loading and unloading to only occur within the shed, with appropriate cleanup procedures implemented. The processing plant is bunded internally, with any spills directed to sumps and back into the processing circuit. No discharge of stormwater off site.

5.1.2 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), 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 2020)).

Table 3: Sensitive human and environmental receptors

Human receptors	**Distance from prescribed activity**
Cee and See Caravan Park	1,000 Metres west boundary to boundary
Residential houses	1,080 metres West boundary to boundary 3.7 Kilometres East
Environmental receptors	**Distance from prescribed activity**
Native vegetation	Project is within an ESA but no vegetation associated with the ESA is present.
Fauna	660 metres south southwest
Underlying groundwater (non-potable purposes)	Brackish groundwater 2 to 4 metres below the surface
TECs/PECs	<1 km to Sedgelands in holocence dune swales of the Swan coastal plain. TEC SCP19.
Cultural receptors	**Distance from activity / prescribed premises**
Aboriginal heritage site	9.1 Km North

5.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and takes into account potential source-pathway and receptor linkages as identified in Section 5.1. 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 5.1), 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 W2874/2025/1 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 amendment is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises. 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, commissioning and operation

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Reasoning
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Clearing and construction of plant and buildings	Dust	**Pathway:** Air/windborne pathway **Impact:** Health and amenity	1000 south southwest metres to caravan park	Refer to Section 3.1	C = Minor L = Unlikely **Low Risk**	Y	Condition 1	The applicants controls, the industrial nature of the site and surrounds, and the distance to sensitive receptors mean that construction activity is unlikely to interfere with the health or amenity of people not on the site. Construction work will be subject to the provisions of the *Environmental Protection (Noise) Regulations 1997*
	Noise			Refer to Section 3.1	C = Minor L = Unlikely **Low Risk**	Y		
Commissioning and Operation **(including time-limited-operations operations)**								
Operation of cobalt and nickel refining facility	Dust	Air / windborne pathway causing impacts to health and amenity	1000 south southwest metres to caravan park Commercial premises (Bunnings) 850 metres southwest	Refer to Section 3.1	C = Minor L = Unlikely **Low Risk**	Y	Condition 1	Activities apart from vehicle movements will be conducted inside an enclosed building. The feed area where dry materials are handled has a recirculation water disc and donut scrubber to capture dust. Bag unloading on the feed hopper, bag compactor chute and the swirl hopper will be connected to this unit. Outside areas for vehicle movements will be paved.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Reasoning
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
	Noise	Air / windborne pathway causing impacts to health and amenity		Refer to Section 3.1	C = Minor L = Unlikely **Low Risk**	Y		Process takes place inside an enclosed structure and separation distance to sensitive receptors is large.
	Acid Gas emissions (HCl) Co and Ni emissions	Air / windborne pathway causing impacts to health and amenity	1000 south southwest metres to caravan park Commercial premises (Bunnings) 850 metres southwest	Refer to Section 3.1	C = Minor L = Unlikely **Low Risk**	Y	Conditions 1, 6, 7, 12 and **13**	There is a lime scrubber to neutralise acid gases. Modelling has predicted that ground level concentrations of acid gases will be well below guideline values. Once off monitoring for Co and Ni is considered necessary to confirm there are no impacts from these emissions.
	Stormwater affected by leaks and spills	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality	Adjacent council infrastructure and groundwater 2 to 4 metres depth.	Refer to Section 3.1	C = Minor L = Unlikely **Low Risk**	Y	Condition 1	There is no discharge of stormwater off site. Chemicals stored within permanent and portable bunds. The processing plant is bunded internally. Spill kits are located around the site. Feedstock will be delivered to site in sealed shipping containers and placed onto hardstand area The Delegated Officer considers it unlikely that significant spills or seepage of chemicals will occur.

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

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

6. Decision

The delegated officer has determined the proposal to construct and operate a plant to produce cobalt sulphate and the electrowinning of nickel with an option for electrowinning of cobalt does not pose an unacceptable risk of impacts to environmental or public receptors. This determination is based on:

- the industrial location of the premises;
- the applicant's controls on storage of chemicals and discharge of stormwater;
- the potential for noise emissions controlled by enclosing the process in a building;
- the feed area where dry materials are handled has a recirculation water disc and donut scrubber to capture dust;
- the revised air quality modelling based on the premises design and the technical review of the modelling; and
- sufficient separation to sensitive receptors.

The delegated officer has determined to apply regulation controls in the works approval requiring the monitoring of nickel and cobalt emissions from the stack; to confirm they are not emissions of concern.

6.1 Works approval and licence

Works Approval W2874/2025/1 that accompanies this report authorises construction of the new plant and following the submission of compliance certification reports, the provision for a time-limited operational period. The conditions in the issued works approval, as outlined in the above risk table have been determined in accordance with the *Guidance Statement: Setting Conditions* (DER 2015).

A licence amendment is required to authorise emissions associated with the ongoing operation of the new plant. A risk assessment for the operational phase has been included in this report, however licence conditions will not be finalised until the department assesses the licence amendment application. Conditions will be imposed to ensure day-to-day operations do not pose an unacceptable risk of impacts to on- and off-site receptors.

6.2 Applicant comments on draft decision

The applicant was provided with drafts of the works approval and this report on 20 August 2025. The applicant replied on 27 August 2025 and had some queries regarding the decision report and works approval which are set out in Appendix 1

7. 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) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.

Appendix 1: Summary of applicant's comments on risk assessment and draft conditions

Condition	Summary of applicant's comment	Department's response
Decision report Section 2.3 *Residues (including empty bulka bags) from processing circuit meet criteria for disposal at general waste landfill facility*	Given that no residues will be produced until the plant has been commissioned, can we safely assume that testing of residues produced during the commissioning phase can be used as evidence that the chemical and physical attributes of process wastes are consistent with general waste (Class II or Class III) landfill criteria as set out in DWER's *Landfill Waste Classification and Waste Definitions 1996 (as amended 2019*)?	The Delegated Officer advises that this approach is acceptable.
Decision report 3.1.2 It is noted the proponent did not include cobalt, nickel and other metal emissions in the assessment; the applicant is required to confirm that metals are not an emission of concern. Decision report Section 6 The delegated officer has determined to apply regulation controls in the works approval requiring the monitoring of nickel and cobalt emissions from the stack; to confirm they are not emissions of concern.	The Applicant advises that emissions of cobalt and nickel are not likely during the wet process that is used by the facility not withstanding this, a wet scrubber is in use. Table 5 in the draft works approval requires testing of off gas scrubber stack emissions for HCl, cobalt and nickel during time limited operations but no emission limit has been proposed. The applicant seeks clarification on what evidence is required by DWER to 'confirm that metals are not an emission of concern'.	Wording has been updated to clarify this was a recommendation of the internal review. The Delegated Officer notes that time limited operations includes one round of stack testing for cobalt and nickel, and these results are required to be reported to the CEO following completion of time limited operations. DWER will review these results to determine if the emissions are of concern, and to inform any future licence amendment application for the facility. The works approval holder may wish to make use of the screening test in DWER's Draft-guideline-air-emissions.pdf to demonstrate that metals are not an emission of concern, however this is not a requirement of the works approval.
Conditions 9 and 13	The applicant noted editing errors in conditions 9 and 13.	The errors have been corrected.