



Application for Works Approval Amendment

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

Works Approval Number	W6499/2021/1
Works Approval Holder	Covalent Lithium Pty Ltd
ACN	623 090 139
File Number	DER2020/000568, INS-0002412, APP-0033883
Premises	Covalent Lithium Hydroxide Refinery 15 Mason Road KWINANA BEACH, WA 6167 Legal description – Lot 15 on Deposited 74883 As defined by Figure 1 in Schedule 1 of the Works Approval
Date of Report	22 April 2026
Proposed Decision	Revised works approval granted

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an officer delegated under section 20 of the *Environmental Protection Act 1986* (WA)

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1. Decision summary

Works approval W6499/2021/1 (W6499) is held by Covalent Lithium Pty Ltd (works approval holder, Covalent) for the lithium hydroxide refinery on Mason Rd, Kwinana (the premises).

The delegated officer has determined to grant amendments to works approval W6499/2021/1. This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the premises. As a result of this assessment, revised works approval W6499/2021/1 has been granted.

This report documents the amendments made according to sections 59 and 59(B) of the *Environmental Protection Act 1986* (EP Act).

The decision report for the existing works approval will remain on the department's website for future reference and will act as a record of the department's decision-making.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment 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 23 February 2026, the works approval holder submitted an application to the department to amend works approval W6499/2021/1 (W6499) under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are proposed:

- increase the height of the off-gas calciner stacks for trains 1 and 2 as follows:
 - SK1 from 46 metres above ground level (mabgl) to 97.5 mabgl;
 - SK4 from 45.7 mabgl to 97.2 mabgl.
- extend the total environmental commissioning period from 90 to 180 calendar days in aggregate;
- undertake additional stack air emission monitoring events during environmental commissioning;
- increase monitoring requirements during time-limited operations (TLO);
- include additional air emission sampling parameters;
- introduce a new condition requiring an ambient odour survey program; and
- extend the works approval expiry date from 30/08/2026 to 31/12/2027 to accommodate proposed changes.

This amendment is for changes to categories 31 and 44 activities. No changes to the existing assessed production capacities have been requested.

2.3 Background

Covalent commenced construction of trains 1 and 2 at the Kwinana Lithium Refinery in August 2021. Since then, train 1 has operated under environmental commissioning, during which the department has received a range of community complaints, specifically; 52 odour, three smoke, and four fume complaints, from occupants in Kwinana, Kwinana Beach, and Naval Base. These complaints have highlighted issues of loss of amenity and reported health concerns. Train 2 is

anticipated to begin environmental commissioning in 2026. The delegated officer notes that a portion of the complaints have not been definitively linked to Covalent's operations.

In response to these issues, the department has undertaken site visits and worked with Covalent, prompting a comprehensive operational review. Through this process, Covalent identified that increasing the height of the calciner stacks for both trains represents an effective engineering solution to significantly reduce ground-level air emissions. Covalent has completed the engineering studies required for this amendment and, pending approval, will commence construction of stack extensions.

Covalent intends to continue commissioning activities for the refinery while construction of the stack extensions proceeds. Regular monitoring of stack emissions and odour field assessments will be undertaken, utilising conservative modelling to ensure that potential impacts are evaluated. Covalent have considered additional operational and engineering solutions that are under consideration for technical and commercial feasibility, with all options designed to complement the proposed stack height increase, should further improvements be needed in the future.

2.4 Proposed application changes

2.4.1 Stack height increases

Covalent is seeking an amendment Condition 1 Table 10, Condition 12 Table 4, Conditions 13 and 24 Table 5 to increase the heights of the off-gas calciners for train 1 (SK1) and train 2 (SK4) and for improvements to plume rise and buoyancy through increasing velocity and temperature. The proposed stack design improvements focus on increasing plume rise and buoyancy to improve dispersion and reduce ground level impacts. Specifically, Covalent propose to:

- increase in stack height:
 - train 1 (SK1): from approximately 46 m to 97.5 mabgl;
 - train 2 (SK4): from approximately 45.7 m to 97.2 mabgl;
- increase in plume exit velocity:
 - stack exhaust gas velocity is proposed to increase from approximately 21 m/s (existing) to 95 m/s for both stacks SK1 and SK4 through a cone;
- increase in exhaust gas temperature:
 - stack exhaust temperature is proposed to increase to 200°C for both stacks.

Together, the increased height, higher exit velocity and higher exhaust temperature are intended to increase effective plume height, improve plume buoyancy and dispersion, and reduce the frequency and intensity of ground-level odour impacts.

2.4.2 Environmental commissioning changes

Covalent is seeking several amendments to the environmental commissioning arrangements, as outlined below.

Extension to the environmental commissioning period

Covalent proposes to extend the environmental commissioning period from 90 days to 180 calendar days (in aggregate). This extension is required to verify the performance of the revised calciner stack design, including the increased stack height, exit velocity and exhaust temperature, and to address known data gaps identified during earlier commissioning activities.

The revised stack configuration represents a material change to dispersion characteristics. An extended commissioning period is therefore necessary to allow sufficient operational time to:

- capture a representative range of meteorological conditions;

- observe air emissions and odour behaviour under different process states to allow adjustments; and
- reduce uncertainties identified in the air dispersion modelling assumptions.

This amendment includes consequential changes to Condition 15, Table 5 in W6499.

Additional stack air emission monitoring during environmental commissioning

Covalent proposes to undertake additional stack air emission monitoring beyond that already completed (two to five sample events), particularly following implementation of the revised stack heights, exit velocities and temperatures.

Expanded monitoring during environmental commissioning will include:

- Three additional sampling events for each stack (SK1 and SK4) to address uncertainties identified in earlier testing, including variability associated with feedstock type and operating conditions.
- Sampling of existing parameters, including:
 - total suspended particulates (TSP);
 - particulate matter less than 10 microns (PM10);
 - nitrogen oxides (NO_x); and
 - flow rate.
- Sampling of additional parameters, including:
 - sulphur dioxide (SO₂);
 - volatile organic compounds (VOCs);
 - acid gases (hydrogen chloride and hydrogen fluoride); and
 - arsenic.
- Odour sampling on two occasions during the extended commissioning period.

These measures are intended to ensure sufficient data is available to confirm air quality and odour performance under the revised stack configuration. In particular, the additional monitoring will:

- confirm that the increased stack height and exit velocity materially reduce odour impacts;
- verify that emission rates used in the dispersion modelling remain representative following the stack upgrades; and
- support regulatory confidence that the revised configuration performs as predicted.

The additional monitoring will also provide improved characterisation of emissions under Float/DMS blended feedstock operations, during which the highest odour, total organic carbon (TOC) and VOC concentrations have previously been observed.

Purpose of the proposed commissioning changes

Taken together, the proposed amendments to environmental commissioning are intended to:

- address uncertainties identified in earlier testing;
- validate the effectiveness of the revised stack design in reducing odour impacts;
- provide sufficient data to support transition from commissioning to standard operations; and
- reduce the likelihood of future odour complaints by confirming performance under realistic operating conditions.

2.4.3 Time limited operations changes

For time-limited operations, the proposed changes include enhanced monitoring requirements to Schedule 3 Table 11.

Covalent proposes to increase air emission monitoring during time-limited operations from two to three sampling events with sampling undertaken during normal operating conditions. Covalent considers that sampling within normal operating conditions will better characterise potential impacts during steady state or normal transitional plant operations.

The proposed monitoring will include the additional air emission parameters identified for environmental commissioning, except for odour monitoring.

The intent of these changes is to provide greater regulatory confidence that air emissions remain acceptable during periods when plant operation may vary from steady-state conditions.

2.4.4 Field based odour verification

Covalent proposes a new works approval condition requiring a field-based ambient odour survey program, to be implemented in alignment with the stack sampling undertaken during environmental commissioning and time-limited operations.

The program will involve the deployment of structured field odour surveys in the surrounding area once the revised stack height, exit velocity and exhaust temperature modifications have been implemented.

The primary purpose of the odour surveys is to confirm the intensity and character of odour in the surrounding environment and to determine whether odour impacts have changed when compared with conditions prior to the stack design improvements. This will allow verification that the revised stack configuration is performing as predicted and that odour impacts remain acceptable.

The surveys will be undertaken during environmental commissioning and/or the early operational phases following implementation of the stack modifications. Where practicable, survey timing will be coordinated with commissioning and time-limited operations stack sampling events to enable correlation between stack emissions, operational conditions and observed odour. Covalent commits to continuing its established and ongoing liaison with neighbouring properties to investigate any observed odour at their premises.

Data collected through the odour survey program is intended to meet the information requirements of the Odour Emissions Guideline (DWER, 2019) and to support ongoing risk assessment in accordance with the Risk Assessments Guideline (DWER, 2020). Covalent considers, the proposed odour survey program to be a practical verification measure to complement dispersion modelling and confirm that odour impacts remain low and acceptable in practice.

2.5 Air Quality Assessment

2.5.1 Air Quality and odour modelling

Air quality

An air quality and odour dispersion modelling assessment was undertaken to support the proposed calciner stack design improvements at the Covalent Lithium Hydroxide Refinery. The assessment considered emissions from the two calciner stacks only (Train 1 and Train 2) and was undertaken in isolation from other refinery emission sources, neighboring industries and background air quality contributions. Dispersion modelling was carried out using the CALMET/CALPUFF modelling suite, incorporating site-representative meteorological data for the 2019 calendar year, which was selected as being representative of longer-term regional conditions.

The modelling adopted the proposed post-improvement stack parameters for both calciners, including increased stack height, higher exit velocity and elevated exhaust temperature, which together improve plume rise and dispersion potential. Building downwash effects were incorporated into the model configuration. Emission rates for key pollutants were derived from commissioning stack testing undertaken on the train 1 calciner, with the highest measured concentration for each pollutant applied to both stacks. This approach is conservative and appropriate for a screening-level assessment of potential impacts.

Emissions were assumed to occur continuously at a constant rate over the modelled period. Abnormal operating conditions, such as plant upsets, start-ups or shutdown events, were not modelled. However, Covalent used maximum measured stack testing results to provide a conservative representation of potential emissions for the purpose of assessing the proposed stack design improvements.

Table 1: Predicted ground level concentrations for both calciner trains 1 and 2

Pollutant (averaging)	Applicable criterion	² Max predicted (Area A)	% of criterion	² Max predicted (Area C)	% of criterion
NO ₂ (1-hour)	¹ 151 µg/m ³	26.3 µg/m ³	17.4	8.3 µg/m ³	5.5
NO ₂ (annual)	¹ 28 µg/m ³	0.18 µg/m ³	0.64	0.02 µg/m ³	0.06
SO ₂ (1-hour, limit)	² 1,400 µg/m ³ (Area A EPP limit) / 700 µg/m ³ (Area C EPP limit)	157 µg/m ³	11.2 (of 1,400)	50 µg/m ³	7.1 (of 700)
SO ₂ (24-hour, standard)	² 200 µg/m ³ (Area A) / 125 µg/m ³ (Area C)	7.4 µg/m ³	2.0	2.8 µg/m ³	1.4
SO ₂ (annual, standard)	² 60 µg/m ³ (Area A) / 50 µg/m ³ (Area C)	1.1 µg/m ³	1.3	0.1 µg/m ³	0.2
Total CPM (24-hour) (PM _{2.5} proxy)	¹ 18 µg/m ³	9.7 µg/m ³	53.8	3.7 µg/m ³	20.6
Total CPM (annual) (PM _{2.5} proxy)	¹ 6 µg/m ³	1.4 µg/m ³	23.2	0.1 µg/m ³	2.1
HF (1-hour, health)	³ 60 µg/m ³	65.6 µg/m³	⁷109.4	20.8 µg/m ³	34.6
HF (24-hour, health)	³ 31 µg/m ³	3.1 µg/m ³	10.0	1.2 µg/m ³	3.8
HF (24-hour, vegetation)	⁴ 2.9 µg/m ³ (applied beyond Area A)	n/a	n/a	1.2 µg/m ³	41.1
Arsenic (1-hour)	³ 9.9 µg/m ³	0.15 µg/m ³	1.5	0.048 µg/m ³	0.5
Arsenic (24-hour)	⁴ 0.027 µg/m ³	0.0072 µg/m ³	26.6	0.0027 µg/m ³	10.2
Arsenic (annual)	⁴ 0.0027 µg/m ³	0.0010 µg/m ³	38.1	0.000091 µg/m ³	3.4
Chromium (1-hour) (assessed as Cr VI)	⁶ 0.09 µg/m ³	0.0095 µg/m ³	10.5	0.0030 µg/m ³	3.3
Chromium (annual) (assessed as Cr VI)	⁴ 0.00018 µg/m ³	0.000064 µg/m ³	35.8	0.0000057 µg/m ³	3.2
Nickel (1-hour)	⁵ 0.18 µg/m ³	0.0084 µg/m ³	4.7	0.0027 µg/m ³	1.5
Nickel (24-hour)	⁶ 0.14 µg/m ³	0.00040 µg/m ³	0.3	0.00015 µg/m ³	0.1
Nickel (annual)	⁶ 0.003 µg/m ³	0.000057 µg/m ³	1.9	0.0000051	0.2

Pollutant (averaging)	Applicable criterion	² Max predicted (Area A)	% of criterion	² Max predicted (Area C)	% of criterion
				µg/m ³	
Silicon (24-hour) <i>(silica proxy)</i>	49.2 µg/m ³	0.25 µg/m ³	2.8	0.098 µg/m ³	1.1
Silicon (annual) <i>(silica proxy)</i>	42.7 µg/m ³	0.037 µg/m ³	1.4	0.0032 µg/m ³	0.1

Notes: Red denotes exceedance.

1. NEPC (2021)
2. Kwinana EPP (1999)
3. EPAV (2022)
4. Toxikos (2011) and (DWER 2019)
5. EPA NSW (2016) and DWER (2019)
6. DoH/Duffus J (2009) and DWER (2019)
7. A single one-hour exceedance of the health-based hydrogen fluoride criterion was predicted within Kwinana EPP Area A, which is designated for heavy industrial land use. No exceedances were predicted at residential and recreational sensitive receptors

Modelled ground-level concentrations of nitrogen dioxide, sulphur dioxide, condensable particulate matter (CPM) and the assessed metals were predicted to be below the applicable air quality criteria at all sensitive receptors and beyond the premises boundary (see Table 1). Predicted concentrations of hydrogen fluoride were also below the relevant assessment criteria across most of the modelled area. A single one-hour exceedance of the health-based hydrogen fluoride criterion was predicted within Kwinana EPP Area A, which is designated for heavy industrial land use. No exceedances were predicted at residential and recreational sensitive receptors.

Odour

Odour dispersion modelling was also undertaken using the CALPUFF model to assess potential odour impacts associated with calciner emissions. Odour emission rates were derived from stack testing undertaken in accordance with AS4323.3 (*Australian Standard-Stationary source emissions – Part 3: Determination of odour concentration by dynamic olfactometry*) and were based on the highest measured in-stack odour concentration and actual exhaust flow. To account for short-term plume fluctuations associated with tall stacks, peak-to-mean factors were applied in accordance with the New South Wales EPA Approved Methods. The adopted assessment benchmark was the conservative NSW criterion of a 99th percentile, one-second average concentration of 2 odour units.

The odour modelling predicts that odour concentrations at all nominated sensitive receptors are at or below the adopted 2 odour unit criterion (see Table 2). A small, localised area within the Kwinana Industrial Area (Area A) was predicted to slightly exceed the criterion, with modelled 99th percentile, one-second average odour concentrations of about 2.1 to 2.3 odour units. These exceedances were limited in spatial extent, occurred infrequently, and were confined to land designated for heavy industrial use. No exceedances were predicted at residential receptors or other sensitive land uses. When results were rounded in accordance with NSW EPA reporting conventions, which express odour outcomes as whole odour units, the predicted concentrations equated to 2 odour units, indicating compliance with the adopted criterion.

Overall, the modelling demonstrates a low risk of unreasonable odour impact, noting that the proposed increases in stack height and exit velocity are expected to improve plume dispersion and reduce ground-level odour impacts compared with the existing approved configuration.

Table 2: Predicted odour ground level concentrations for calciner trains 1 and 2

Receptor	Receptor description	¹ Modelled odour concentration (C99, 1-second, ou)	Criterion (ou)	Result
R1	Medina (residential)	0.4	2	Meets criterion
R2	Beeliar Regional Park	0.2	2	Meets criterion
R3	Kwinana Industrial Area – business receptor	1.2	2	Meets criterion
R4	Kwinana Industrial Area – business receptor	1.0	2	Meets criterion
R5	Kwinana Industrial Area – business receptor	1.5	2	Meets criterion
R6	Kwinana Industrial Area – business receptor	0.6	2	Meets criterion
SR1	Additional receptor – north of site	0.8	2	Meets criterion
SR2	Additional receptor – inland from Medina	0.3	2	Meets criterion
SR3	Additional receptor – south-west of site	0.5	2	Meets criterion

Note

1. Modelled odour concentrations represent the 99th percentile, 1 second average, including peak to mean factors, in accordance with the NSW EPA Approved Methods for tall stacks

2.5.2 Department review of air quality modelling

Air emissions

The department reviewed the proponent's updated air quality and odour dispersion modelling submitted in support of proposed calciner stack design changes. The review was undertaken by the Air Quality Branch (AQB) against the requirements of the *Air Quality Modelling Guidance Notes* (DoE, 2006).

The department notes that the dispersion modelling approach selected (including the choice of model), the meteorological data used and air quality assessment criteria applied were considered appropriate for the assessment. The air quality modelling was deliberately isolated to the calciner stacks as the focus of the works approval amendment. A 2021 air quality model of all on-site emissions sources and cumulative impacts was submitted in the original works approval assessment and remains valid.

However, the department considers that the submitted air quality modelling does not meet departmental requirements and does not provide a sufficiently robust basis to support the conclusions drawn by the proponent. Key deficiencies identified include:

- modelling was limited to two calciner stacks only, with other on-site emission sources excluded, despite these having been included in previous assessments for the same premises;
- cumulative impacts were not assessed, including background concentrations and emissions from nearby industries within the Kwinana airshed; and
- upset and non-routine operating scenarios were not modelled, with no adequate justification provided for their exclusion.

As a result, confidence in predicted ground-level concentrations, compliance conclusions, and the assessment of impacts at sensitive and occupational receptors is reduced.

Organic emissions (TOC and VOCs)

The department does not accept the proponent's justification for excluding total organic carbon (TOC) and volatile organic compounds (VOCs) from the modelling assessment. Incomplete speciation and variability in stack testing data do not remove the obligation to characterise emissions that may contribute to off-site impacts. VOCs present in calciner emissions are also expected to be present in the Condensable Particulate Matter (CPM) which was modelled as part of this assessment with criterion for PM_{2.5} used as a proxy.

Additional stack testing and characterisation of speciated TOC and VOC emissions across a representative range of operating conditions is recommended to improve confidence in emission estimates and support any future assessment or regulatory decision-making.

Hydrogen fluoride (HF) impacts

The modelling predicts a 1-hour average hydrogen fluoride concentration exceeding the adopted health-based guideline value within the Kwinana Industrial Area. This exceedance occurs despite the modelling not accounting for cumulative HF emissions from other known regional sources. Given the potential for worker exposure at neighbouring premises, the department considers this a significant issue that warrants further assessment. Regular monitoring of HF emissions from the calciner stacks is recommended to verify performance and manage the residual risk.

Odour

The odour modelling approach adopted by the proponent is not consistent with departmental requirements. The use of odour criterion modelling and interstate odour criteria is not accepted due to inherent uncertainties. The department recommends that odour be assessed in accordance with Guideline: Odour emissions (DWER, 2019), supported by appropriate qualitative and operational management tools.

Overall, the department considers that further information and assessment are required before the modelling can be relied upon to demonstrate acceptability of the proposal from an air quality and odour impact perspective.

The delegated officer considered the AQB technical review, the history and nature of odour complaints associated with the premises, and that Covalent is progressing actions intended to resolve ongoing odour issues.

On this basis, the delegated officer determined to condition the works approval holder to:

- **undertake additional stack testing and characterisation of TOC and VOC emission from the calciners.**
- **conduct monitoring of HF emissions; and**
- **undertake an odour assessment in accordance with DWER's *Guideline: Odour emissions* (DWER, 2019) (*noting that the works approval holder intends to undertake other methods concurrently*).**

Covalent should note the following advice, which may be required in the future should ongoing odour or air quality issues occur:

- undertake a revised air quality modelling assessment fully consistent with the *Air Quality Modelling Guidance Notes*, incorporating:
 - all relevant on-site emission sources;
 - cumulative impacts from nearby industries and background concentrations; and
 - upset and non-routine operating scenarios;
- develop and implement appropriate management plans to verify performance and manage residual risk of HF emissions and other TOC and VOC emissions as required.

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 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.

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 Amendment Report are detailed in Table 3 below. Table 3 also details the proposed control measures the works approval holder has proposed to assist in controlling these emissions, where necessary.

Table 3: Works approval holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Placement of stacks including vehicle movements (reversing beepers)	Air/windborne pathway	As per existing controls in works approval W6499 (Condition 4 Table 1)
Noise			No controls, <i>Environmental Protection (Noise) Regulations 1997</i> applies.
Commissioning and operations			
Odour	Processing and refining materials including transfer through the process (operation and processing of ore concentrate)	Air/windborne pathway	Field odour surveys Odour monitoring through calciner stacks. Increase in calciner stack heights. Cone on stack to increase exit velocity. Increasing temperature of exit gases via plant operating system.
Gaseous emissions (NOx, CO, SO2, acid gases) particulates and VOCs, Dust			Bag filters as per existing controls in works approval W6499. Increase in calciner monitoring and new parameters for environmental commissioning and time limited operations. Increase in calciner stack heights. Cone on stack to increase exit velocity. Increasing temperature of exit gases via plant operating system.

3.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the delegated officer has excluded employees, visitors and contractors of the works approval holder's from its

assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 4 below provides a summary of potential human and environmental receptors that may be impacted because of activities upon, or emission and discharges from the prescribed premises (*Guideline: Environmental siting* (DWER 2020)).

Table 4: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	Distance from prescribed activity
Medina residential area	2.3 km east of the premises
East Rockingham residential area	4.5 km south of the premises.
Industrial business: <ul style="list-style-type: none"> • Westfarmers LPG Pty Ltd • Western Energy Pty Ltd • IPM Operation and Maintenance Kwinana Pty Ltd • Tiwest Pty Ltd • Western Aus Land 	Adjacent to premises boundary in all directions <ul style="list-style-type: none"> • 60 m from eastern edge of the premise's boundary • 70 m from eastern edge of the premise's boundary • 20 m from western and southern edge of the premise's boundary • 171 m from southern edge of the premise's boundary • 90 m from northern edge of the premise's boundary
Public facility (Kwinana Golf Club)	2.7 km from the southeastern edge of the premise's boundary
Beeliar Regional Park	5 km from the northeast of the edge of the premises boundary

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and considers 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 works approval holder 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 works approval holder'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 works approval holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 5.

The revised works approval W6499 that accompanies this Amendment Report authorises construction and time-limited operations. The conditions in the Revised Works Approval 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. lithium refinery activities. A risk assessment for the operational phase has been included in this Amendment Report, however licence conditions will not be finalised until the department assesses the licence application and adequacy of improvements.

Table 5. Risk assessment of potential emissions and discharges from the premises during construction, commissioning and operation

Risk Event					Risk rating ¹	Works approval holder's controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls/ DWER comments
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works approval holder's controls	C = consequence L = likelihood			
Construction								
Placement of stacks including vehicle movements (reversing beepers)	Dust	Air/windborne pathway causing impacts to health and amenity	Residences 2.3km southeast of Premises boundary. Industrial business adjacent to premises boundary in all directions, closest 20 m west and south	Existing dust controls in works approval. Refer to Table 3	Low level impact to amenity C = Minor The risk event may only occur in exceptional circumstances L =Rare Low Risk	Y	Condition 4	The delegated officer considered the stakeholder comments, works approval holder's controls, distance to sensitive receptors and considered the risk of dust emissions impacting receptors to be low. The delegated officer determined that the existing works approval holder's controls to be sufficient to manage the risk.
	Noise			No controls. Refer to Table 3	Low level impact to amenity C = Minor The risk event may only occur in exceptional circumstances L =Rare Low Risk	Y	No controls	The delegated officer considered the location of the premises, distance to sensitive receptors and that the <i>Environmental Protection Noise Regulation 1997</i> to be sufficient to manage the risk of excessive noise impacting receptors.
Commissioning and Time Limited Operations								
Processing and refining materials including transfer through the process (operation and processing of ore concentrate)	Odour	Air/windborne pathway causing impacts to health and amenity	Residences 2.3km southeast of Premises boundary. Industrial business adjacent to premises boundary in all directions, closest 20 m west and south	Increasing stack heights, increasing temperature and velocity of air emissions through the stack, monitoring. Refer to Table 3	Mid-level impacts to amenity. Low level or occasional medical treatment C = Moderate The risk event will probably occur in most circumstances L = Likely High Risk	N	Conditions 1, 12, 13, 17, 23, 24, 28 Condition 17 and 28	Having regard to the stakeholder comments, applicant's odour assessment and air quality modelling, the delegated officer determined that predicted odour impacts at receptors were generally acceptable. The works approval holder proposes to increase calciner stack heights, emission velocities and exhaust temperatures to improve dispersion. In considering these engineering measures, alongside odour complaints history, field-based odour survey monitoring and dispersion modelling, the delegated officer determined that the risk of odour emissions affecting the health and amenity of receptors remains high. The delegated officer considered that the proposed controls, including validation monitoring, were insufficient to manage this risk. However, it is noted that ongoing verification monitoring will provide a mechanism to confirm performance and inform any further management measures, should impacts on receptors be identified. The delegated officer determined to condition the requirements for odour monitoring during environmental commissioning and time limited operations using the department's Odour Guideline, noting that additional odour monitoring maybe run concurrently. Furthermore, the delegated officer determined that the works approval holder's controls were conditioned as they were deemed to assist in managing the emission.
	Dust			Existing bag house and filters. Refer to Table 3	Low level impact to amenity at local scale. C = Minor The risk event will probably not occur in most circumstances L = Unlikely Medium Risk	Y	Conditions 1 and 12	The delegated officer considered the works approval holder's existing controls, distance to sensitive receptors and considered the risk of dust emissions impacting receptors to be medium. The delegated officer determined that the existing works approval holder's controls to be sufficient to manage the risk.
	Gaseous emissions (NOx, CO, SO2, metals, acid gases, particulates and VOCs)			Increasing stack heights, increasing temperature and velocity of air emissions through the stack, monitoring. Refer to Table 3	Mid-level impacts to amenity. Low level or occasional medical treatment C = Moderate The risk event will probably occur in most circumstances L = Likely High Risk	N	Conditions 1, 12, 17, 23, 24 Conditions 15 and 26	Having regard to the stakeholder comments, applicant's air quality modelling and the department technical review, the delegated officer determined that predicted point source emission impacts on receptors were acceptable. The works approval holder proposes to increase calciner stack heights, emission velocities and exhaust temperatures. In considering these engineering changes, along with increased validation monitoring, fume/odour complaints history and the air emissions modelling, the delegated officer determined that the risk of gaseous emissions affecting the health and amenity of receptors remains high. The delegated officer considered that the proposed controls, including validation monitoring, were insufficient to manage this risk.

Risk Event					Risk rating ¹ C = consequence L = likelihood	Works approval holder's controls sufficient?	Conditions ² of works approval	Justification for additional regulatory controls/ DWER comments
Source/Activities	Potential emission	Potential pathways and impact	Receptors	Works approval holder's controls				
								<p>The delegated officer determined to condition the requirements for gaseous monitoring during environmental commissioning and time limited operations including further speciation of TOCs and VOCs and HF.</p> <p>Furthermore, the delegated officer determined that the works approval holder's controls were conditioned as they were deemed to assist in managing the emission.</p> <p>It is noted that ongoing verification monitoring will provide a mechanism to confirm performance and inform any further management measures, should impacts on receptors be identified.</p>

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

Note 2: Proposed Works Approval Holder's controls are depicted by standard text. **Bold and underline text** depicts additional regulatory controls imposed by department.

4. Discussion

The proposed amendments primarily relate to air emission management and are intended to address ongoing odour complaints reported during environmental commissioning. These amendments include increased calciner stack heights for trains 1 and 2, revised environmental commissioning, enhanced monitoring during commissioning and time-limited operations, a field-based odour verification program, and an extension of the works approval expiry date.

In assessing the proposed amendments, the delegated officer considered the potential risks to the environment and public health, with particular focus on air quality and odour impacts. The department reviewed the proponent’s updated air quality and odour dispersion modelling, with advice provided by the Air Quality Branch (AQB).

The department considers that the air quality modelling, as submitted, does not fully meet departmental requirements, as it was limited in scope and did not include all on-site emission sources, cumulative impacts or upset and non-routine operating scenarios. These limitations reduce confidence in the conclusions drawn from the modelling, particularly in relation to cumulative and worst-case impacts.

Odour modelling was undertaken by the proponent outside the department’s odour guideline framework and was therefore not formally assessed. Notwithstanding this, the modelling indicates that the proposed increase in stack heights is likely to improve dispersion characteristics. Based on this, and acknowledging the limitations of the assessment, the department considers that the proposed engineering upgrades are not expected to worsen existing air quality or odour impacts, and may assist in reducing off-site odour risk.

The delegated officer also considered that any residual performance risk associated with the modified stack configuration appropriately rests with Covalent. Should air quality or odour impacts arise following implementation of the increased stack heights, it would be up to Covalent to demonstrate that emissions are being effectively dispersed. Where this cannot be demonstrated, Covalent may be required to investigate and implement alternative or additional emission controls or mitigation measures.

The proposed extensions to the commissioning framework, together with enhanced monitoring and verification requirements, are expected to improve regulatory confidence by enabling the performance of the revised stack configuration to be assessed across a range of operating conditions, including during commissioning and time-limited operations.

Based on this assessment, the delegated officer has determined that, subject to appropriate conditions relating to monitoring, odour assessment and verification of performance, the proposed amendments do not pose an unacceptable risk to the environment or public health and has decided to grant a revised works approval, subject to appropriate conditions.

5. Consultation

Table 6 provides a summary of the consultation undertaken by the department.

Table 6: Consultation

Consultation method	Comments received	Department response
Neighbouring industry was advised of proposal on 6 March 2026	Neighbouring industry replied on 25 March 2026. Overall support is provided for the proposed amendments. This includes support for the increased stack heights, extension of the commissioning period, continuation of time-limited	The delegated officer notes these comments and considers the construction will be managed under existing controls and EP (Noise) Regulations, noting that no complaints have been received to date for construction. Furthermore,

	operations, the proposed emissions monitoring program, and the ambient odour surveys. It is requested that construction-phase dust, noise and working hour controls be communicated ahead of works, and that monitoring and sampling results, including any exceedances, be shared with stakeholders within agreed timeframes.	the regulatory framework under the EP Act focuses on reporting to the department as the regulator. While the department supports transparency, it does not have the power to require a works approval holder to provide monitoring data directly to third parties. Decisions about sharing information outside the statutory reporting arrangements therefore sit with Covalent and their stakeholder engagement.
Works approval holder was provided with draft amendment on 14 April 2026	The applicant provided comments on 20 April 2026. See Appendix 1	See Appendix 1

6. Conclusion

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

6.1 Summary of amendments

Table 7 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the revised works approval as part of the amendment process.

Table 7: Summary of works approval amendments

Condition no.	Proposed amendments
Front page	Change of works approval expiry date.
Works approval history	Addition of the amendment and Environmental Online application column.
Condition 12 Table 4	Addition of operating requirements for calciner stack cones and plant operating system. Increase of environmental commissioning duration. cone
Condition 13 Table 5	Change to discharge point heights for calciner stacks SK1 and SK4
Condition 17 and 28 Table 8	Addition of field odour survey conditions for environmental commissioning and time limited operations.
Conditions 18, 20, 33	Update of reference numbers.
Definitions	Inclusion of new definitions.
Schedule 2 Table 10	Update of installation requirements for stack heights for SK1 and SK4 and cones.
Schedule 3 Table 11	Update of air emission monitoring including new parameters, and changes to environmental commissioning and time limited operations sample events.

References

1. Covalent Lithium Pty Ltd, 2026, *Works Approval W6499/2021/1 Application and supporting document*, Perth Western Australia.
2. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
3. Department of Water and Environmental Regulation (DWER) 2019, *Air Emissions Guideline- Draft for external consultation October 2029*, Perth Western Australia.
4. DWER 2019, *DWER's Guideline: Odour emissions*, Perth, Western Australia.
5. DWER 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
6. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
7. DWER 2025, Amendment Report W6499/2021/1 - *Covalent Lithium Pty Ltd*, issued 8 April 2025, Perth, Western Australia.
8. Department of Health (DoH) and Duffus J, 2009, *Assessment of the potential for health problems associated with the export of sulfidic nickel concentrate through the Port of Esperance*, Perth, Western Australia.
9. Department of Environmental and Conservation (EPA) NSW 2016, *Approved methods for the modelling and assessment of air pollutants in New South Wales*, Sydney. New South Wales.
10. Environmental Technologies & Analytics (ETA), 2026, *Covalent Lithium Hydroxide Refinery- Air quality and Odour Assessment of Calciner Emissions for Stach design Improvements*, Perth, Western Australia.
11. EPAV 2022, *Guideline for Assessing and Minimising Air Pollution in Victoria (for air pollution managers and specialists)*, EPA Victoria, Melbourne Victoria.
12. National Environment Protection Council (NEPM) (1998). *National Environment Protection (Ambient Air Quality) Measure 1998*, Adelaide, South Australia.
13. Toxikos 2010, *Air quality guideline values for selected substances – prepared for the Department of Environment and Conservation*, Perth Western Australia

Appendix 1: Summary of works approval holder's comments on risk assessment and draft conditions

Condition	Summary of works approval holder's comment	Department's response
Section 2.3 Background	Covalent requests that the department acknowledge that complaints received by the department were during commissioning, they have not been definitively linked to the Covalent operations.	The delegated officer notes this request and recognises that some complaints have not been linked to a source and has updated this within the section.
Section 2.4.3 Time limited operations changes	Covalent have indicated that there are no changes proposed to Table 5 in the works approval, other than an amendment to the discharge point height. An increase in TLO monitoring is included in Table 11. Covalent is not specifically targeting non-normal operating conditions and has requested that the second paragraph be revised to remove references to non-normal operating conditions.	The delegated officer has updated the references to normal operating conditions.
Section 2.4.4 Field based odour verification	Covalent has requested that the following text is added " <i>Covalent commits to continuing its established and ongoing liaison with neighbouring properties to investigate any observed odour at their premises.</i> "	The delegated officer has added this comment.
Section 2.5.1 Air quality and odour modelling	Covalent requested to add foot note regarding 109.4 HF exceedance.	The delegated officer has added this comment.
Section 2.5.2 Department review of air quality modelling	<p>Covalent notes the air quality modelling was deliberately isolated to the calciner stacks as the focus of the works approval amendment. A 2021 air quality model of all on-site emissions sources and cumulative impacts was submitted in the original works approval assessment and remains valid.</p> <p>Covalent acknowledges DWER advice that a revised air quality modelling assessment may be required. Covalent considers this would be an update of the 2021 model with the taller calciner stacks and additional POPC.</p> <p>VOCs present in calciner emissions are also expected to be present in the Condensable Particulate Matter (CPM) which was modelled as part of this assessment with criterion for PM2.5 used as a proxy.</p>	The delegated officer notes this.