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	W3088/2025/1
Applicant	Australian Gold Reagents Pty Ltd
ACN	009 140 121
File number	INS-0003088 | APP-0030704
Premises	Australian Gold Reagents Lot 20 Kwinana Beach Road KWINANA BEACH WA 6167 Legal description - Part of Lot 20 on Diagram 78086 Certificate of Title Volume 1918 Folio 222 As indicated by the maps in Schedule 1
Date of report	04 March 2026
Proposed Decision	Works approval granted

Michael Greenslade
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MANAGER, HEAVY INDUSTRIES

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

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1. Decision summary

This decision report documents the assessment of potential risks to the environment and public health from emissions and discharges associated with Stage 2 expansion works at the premises. As a result of this assessment, works approval W3088/2025/1 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 Background

Australian Gold Reagents Pty Ltd (AGR; the applicant) holds licence L6110/1990/13 for the Kwinana Sodium Cyanide Manufacturing Facility (SCMF) located at Part of Lot 20 on Diagram 78086 (the premises), Kwinana Beach.

The premises is located within the CSBP Kwinana Industrial Complex (KIC) in the Kwinana Industrial Area (KIA) and consists of two sodium cyanide (NaCN) plants (SCP1 and SCP2). These plants produce a ~40% weight/weight (w/w) liquid NaCN which is diluted prior to dispatch or fed to the sodium cyanide solids (SCS) plant for the manufacture of NaCN briquettes. Under the existing licence (L6110/1990/13), SCP1 and SCP2 are authorised to produce a combined output of 91,000 tonnes per annum (tpa) of pure (100%) NaCN, and the SCS plant is authorised to produce 45,000 tpa of NaCN briquettes (>97% NaCN). The total assessed production capacity of the licence is currently 136,000 tpa under category 31: Chemical manufacturing.

On 3 July 2024, a works approval (W6952/2024/1) was granted for the Stage 1 expansion project which involves debottlenecking of existing infrastructure resulting in an increase in sodium cyanide (NaCN) production capacity. The Stage 1 expansion project includes modification of existing infrastructure and the construction and installation of new infrastructure to debottleneck the manufacturing process at SCP1 and the SCS, thus increasing NaCN production up to a combined total of 170,000 tpa.

2.3 Application summary

On 28 August 2025, the applicant submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act) for additional expansion works (Stage 2).

The Stage 2 expansion works will involve the following:

- debottlenecking of existing SCP2 infrastructure (similar to Stage 1 works previously authorised under works approval W6952/2024/1 for SCP1) to enable an increase in total liquid NaCN production capacity from 110,000 tpa to 150,000 tpa;
- replacing the existing Maxitherm incinerator with a new higher capacity, three-stage John Zink thermal oxidiser (TO3);
- removing the existing start-up vents as start-up waste gas will be directed to the incinerators for destruction; and
- installation of a new NaCN storage tank (TK-04) to assist in managing additional product manufactured as a result of plant upgrades.

As a result of the expansion works, the total NaCN production will increase from 170,000 tpa to 210,000 tpa as summarised in Table 1.

Table 1: Production of NaCN authorised under relevant Part V approvals (tpa)

Relevant instrument	Liquid NaCN	Solid NaCN	Total NaCN
Existing operations: Licence L6110/1990/13	91,000	45,000	136,000
Stage 1 works: Works Approval W6952/2024/1	110,000	60,000	170,000
Stage 2 works (this application): Works Approval W3088/2025/1	150,000	60,000 (no change)	210,000

2.3.1 Debottlenecking

The proposed debottlenecking works are the same as those undertaken for Stage 1 and as described in Works Approval W6952/2024/1. These include:

- Modification to the natural gas and ammonia filters and removal of the mixed gas filter;
- Replacement of main air blowers;
- Elevation of the steam drum and waste gas stack by 6m;
- Modifications to the reactor for positive pressure; and
- Upgrades to the absorber tower including optimisation of the absorber tower packing.

Figure 1 shows the location of key equipment within SCP2 subject to modification. Works approval W6952/2024/1 can be referred to for a full description of the proposed debottlenecking works.

2.3.2 TO3

Under normal conditions waste gas from the liquid sodium cyanide plants flows to an incinerator for the destruction of hydrogen cyanide (HCN). There are currently two incinerators operating at the premises; a John Zink incinerator and a Maxitherm incinerator. Waste gases can be directed to either incinerator through a common header.

Ammonia sludge, a by-product of the sodium cyanide plant from the vaporisation of liquid ammonia, is also directed to the incinerator for combustion together was waste gas. The ammonia sludge comprises 70% ammonia (NH_3) and 30% water with traces of oil.

The applicant proposes to replace the existing Maxitherm incinerator with a new John Zink incinerator (TO3). The existing interconnecting crossover line between SCP1 and SCP2 will continue to allow waste gas to be directed to either the existing John Zink incinerator or TO3 even after the Maxitherm incinerator has been decommissioned.

TO3 will provide a higher capacity for waste gas treatment (60,000Nm^3/hr) as well as improved incinerator reliability, resulting in less shutdowns and waste gas venting. It will also result in a reduction in greenhouse gas emissions from the premises by avoiding the formation of N_2O (nitrous oxides) which is currently produced by the Maxitherm incinerator. The existing John Zink incinerator will also undergo refurbishment works authorised under Works Approval W6952/2024/1.

TO3 design features include:

- a horizontal NOxIDIZER chamber for reduction of emissions of NOx (oxides of nitrogen) comprising of a three-stage combustion process (reduction stage, quench stage and re-oxidisation stage);
- selective non-catalytic reduction (SNCR) technology which utilises ammonia for the reduction of emissions of NOx during start-up.
- low NOx burners;
- feed gas knock-out (KO) drum to remove entrained droplets in the waste gas feed stream;
- reoxidation fan, maintaining the required chemistry to minimise NOx formation;
- combustion air fan, providing air to the combustion process; and
- burner management system, providing safety and control functions.

Waste gas will be discharged to atmosphere via a 31.7m high stack fitted with a Continuous Emissions Monitoring System (CEMS) for continuous monitoring of NOx emissions. Stack testing of other waste gases (HCN and NH_3) will occur on a quarterly basis.

The applicant has indicated that waste heat recovery may be installed in the future to enable harvesting of waste heat for steam production and power generation through a new turbine alternator (expected to produce between 8-11MW of electrical power). This proposal is not within scope of this current application.

2.3.3 Commissioning

New and existing equipment will be commissioned and tested in a staged approach to ensure limited interruptions to operations as TO3 is brought online and upgrades to the existing John Zink (JZ) incinerator are completed prior to decommissioning of the Maxitherm. The commissioning approach and expected timeframes are outlined below:

Table 2: Stages for commissioning and testing of new and existing incinerators.

Stage of commissioning		Timeframe
1.	**Commissioning and testing of TO.** TO3 will be subject to comprehensive testing to verify functionality and performance.	Installation completed October 2026. Commissioning November 2026 – February 2027
2.	**Refurbishment of the existing JZ incinerator.** The JZ incinerator will be taken offline for maintenance works. During this period, waste gas will be directed to TO3 and the existing Maxitherm incinerator to maintain waste gas treatment capacity. These works are captured under Works Approval W6952/2024/1.	Approximately 6 months duration (March 2027 – September 2027).
3.	**The JZ incinerator will be reinstated** and operated with TO3 to verify combined system performance.	September 2027 – November 2027
4.	The **Maxitherm incinerator will be decommissioned** once stable and reliable operation of both TO3 and the JZ incinerator has been demonstrate.	December 2027

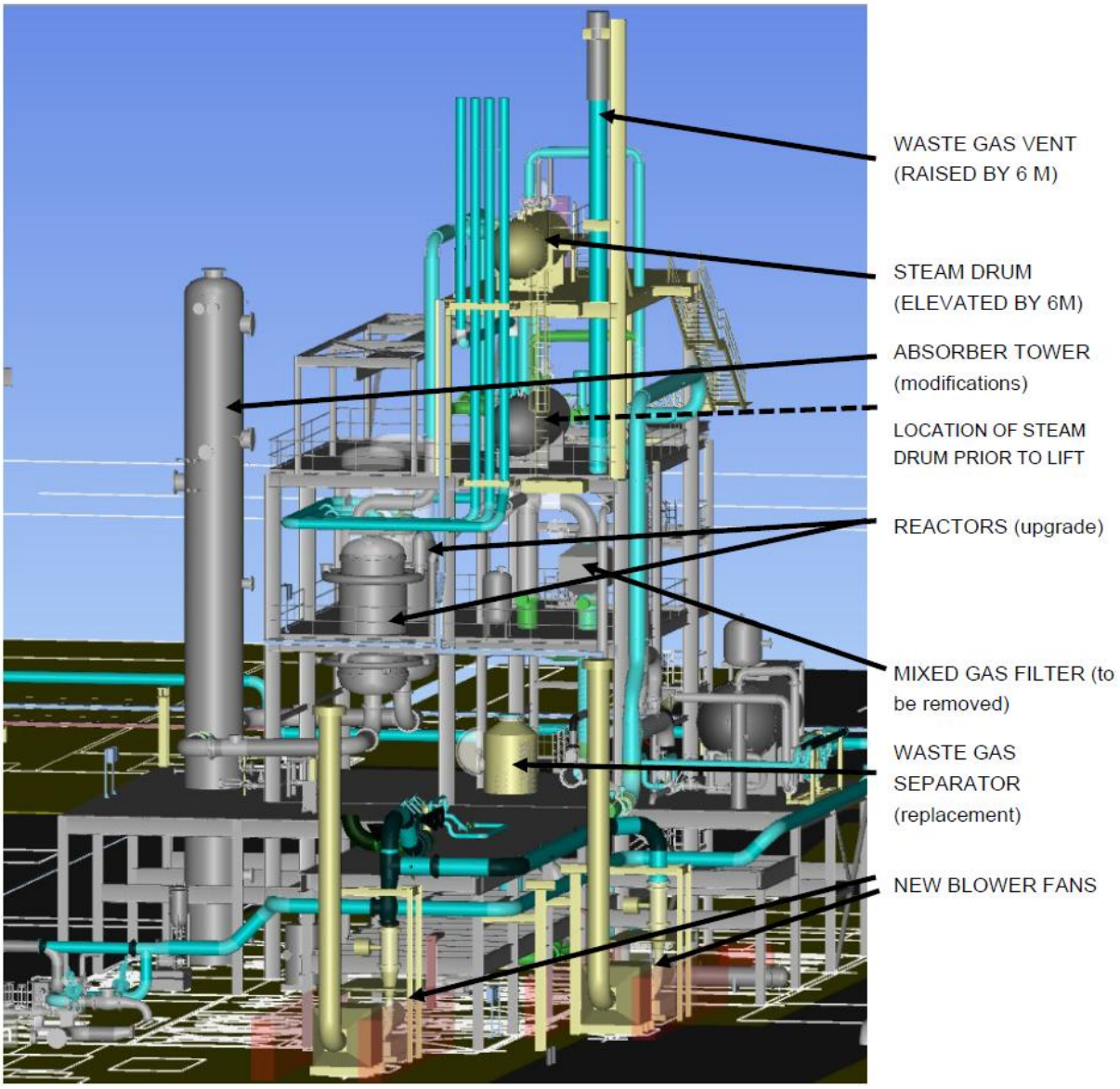

Figure 1: Location of key infrastructure associated with SCP2 debottlenecking works.

3. Legislative context

3.1 Part IV of the EP Act

3.1.1 Stage 1

The proposal to increase production through the Stage 1 works was referred to the Environmental Protection Authority (EPA) by AGR under Part IV of the EP Act. The EPA determined to assess the proposal at a level of Referral Information with additional information required under section 40(2)(a) of the EP Act. EPA Report 1725 was released on 27 June 2022. The proposed modifications were approved by the Minister for Environment subject to the conditions of Ministerial Statement (MS) 1196 (published on 23 August 2022). This supersedes the previous approval (MS 700)

In its report, the EPA noted that air emissions from the premises are currently regulated under the licence (L6110/1990/13) with conditions specifying atmospheric discharge points, emission limits and targets, monitoring and reporting requirements and emissions controls during start up and shut down events. The EPA determined that regulation of emissions to air can continue to

be managed under Part V to meet the EPA's objectives for maintaining air quality, however considered that the licence, and the Start-up and Waste Gas Venting Management Plan, should be updated to include the proposed additional avoidance and management measures relating to start-ups. These additional start-up measures were included in the amended licence granted in August 2022, which included not undertaking start-up operations when the wind conditions originate from 57-80 degrees (towards Wells Park) and allowed waste gas from each production plant to be directed to a combined header before treatment by either of the waste gas incinerators.

3.1.2 Stage 2

AGR applied under s45C of the EP Act to amend MS 1196 for the expansion of liquids production capacity from 110,000tpa to 150,000 tpa (Stage 2 works) through upgrades and debottlenecking. The application also sought to increase the solids production capacity from 60,000tpa to 105,000tpa (future works not part of this application). MS 1196 was subsequently amended on 27 August 2024 authorising these changes as well as changes to clearing provisions to facilitate the expanded disturbance footprint.

In making its determination, the EPA considered results of air quality modellings which indicates that the proposed changes are unlikely to results in exceedances of air quality criteria at sensitive receptors during normal and upset conditions.

Consistent with the outcomes relating to Stage 1 above, the EPA determined that emissions and discharges from the premises can continue to be managed under Part V of the EPA Act.

Greenhouse gas emissions

It is noted that the EPA has considered greenhouse gas (GHG) emissions in its assessment of the Stage 1 proposal; determining that GHG emissions could be limited through Condition 1 of the Ministerial Statement. In its report (Report 1725), the EPA highlighted that, should the limit be exceeded, the Minister for Environment may elect to initiate a section 46 change to the conditions to require a GHG Management Plan. The delegated officer has considered the EPA's assessment of GHG emissions and *Guidance Statement: Setting Conditions* and determined not to unnecessarily duplicate the requirements of MS 700 or reassess GHG emissions as they have already been considered through EPA assessment and conditions.

It is noted that there will be no increase in GHG emissions from the Stage 2 proposal and therefore no further consideration of GHG emissions has been made as part of this assessment.

3.2 *Dangerous Goods and Safety Act 2004*

The facility is classified as a Major Hazard Facility under the *Dangerous Goods Safety (Major Hazard Facility) Regulations 2007*. The most recent Safety Report was submitted on 6 December 2022 and approved on 13 January 2023.

In addition, the facility holds a licence under the *Dangerous Goods Safety Act* (Licence No. DGS012715) and is designed and operated in accordance with relevant approved Australian Standards.

The legislative framework provided by the *Dangerous Goods and Safety Act 2004*, and associated licensing requirements, mandate the implementation of comprehensive risk management and safety management systems. These systems address hazards such as potential exposure to toxic chemicals and gases, as well as risks arising from fire or other major incidents.

Department of Local Government, Industry Regulation and Safety (LGIRS) is considered the primary agency responsible for regulating safety risks including the storage and handling of dangerous goods.

3.3 Planning

Development application was submitted to the City of Kwinana in September 2025 and approved 5 January 2026.

4. Noise

The applicant engaged SLR Consulting Australia (SLR) to undertake an environmental noise assessment (SLR 2024) to assess the impact of changed noise emissions associated with the proposed expansion works. The assessment considered both Stage 1 and Stage 2 upgrades.

Acoustic modelling was conducted using the CONCAWE prediction methodology within the SoundPLAN software. Technical review of the modelling determined that the methodology used is appropriate. The resulting noise assessment report outlines the predicted changes in noise levels at residential areas surrounding the KIA and assesses compliance against the assigned noise levels prescribed in the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations).

The existing prominent noise sources from the plant operation are the air-cooled steam condenser fans, cooling towers, suction air blowers, the Maxitherm blower, with lessor sources associated with the operation of the solids plant, turbine alternator, switching gear, and the reverse osmosis (RO) plant.

Identified changes associated with Stage 2 of the proposed upgrade that were considered in the noise assessment are:

- Installation of two air blowers for SCP2, attenuated;
- Replacement of the Maxitherm incinerator, including associated fans and blowers, with the new TO3;
- Decommissioning the SCP2 air boost blower; and
- Decommissioning the SCP2 vacuum blowers.

The application states that in upgrading the existing SCP, low noise and noise mitigated equipment have been selected to minimise noise emissions, for example, replacing existing vacuum blowers with external sound attenuated blowers.

Predicted noise levels from the proposed plant expansions are expected to comply with the requirements of the Noise Regulations at all noise-sensitive premises during all hours. The upgrades are anticipated to result in a slight reduction in overall noise emissions, primarily due to the replacement of existing vacuum blowers with attenuated positive-pressure blowers (Stages 1 and 2) and the decommissioning of the Maxitherm incinerator (Stage 2).

5. Air quality

5.1 Emissions profile

Key gaseous compounds emission relating to the proposed works are:

- NH_3 and HCN from process gas from SCP1 and SCP2; and
- NOx from the incineration of process gas.

5.1.1 Normal operations

Under normal operating conditions, process gas from the liquid cyanide plants is directed to waste gas incinerators before being discharged to the atmosphere. The current licence specifies a NO_x emission limit of 5 g/s for 95% of operating time. Recognising that short-term exceedances may occur during upset conditions, such as plant trips or temporary throughput

reductions for process safety, the licence allows a higher limit of 12 g/s for up to 5% of the time (see Table 3).

No exceedances of these limits have been reported between 2021 and 2025. The application states that continuous monitoring data indicates that NO_x emissions from SCP1 and SCP2 typically average around 3 g/s, with compliance with the 95% operating limit (5 g/s) achieved more than 99% of the time.

The applicant has requested amendments to the licence limits to accommodate changes to the NOx emissions profile which reflect vendor guarantees of the new TO3 plant. Proposed limits, representing combined emissions from both incinerators, are outlined in Table 3. The applicant anticipates that emissions will be below these levels.

Although higher NO_x emissions are expected due to increased production, an overall net increase in NO_x emissions in the Kwinana airshed is not expected due to the reductions in emissions at nearby facilities (e.g. additional NO_x abatement implanted at the neighbouring CSBP plant and the nearby Alcoa premises entering care and maintenance).

Table 3: Proposed NOx limits compared to limits of existing licence (L6110/1990/13).

Parameter	Current limit (JZ and Maxitherm)	Expected emissions (TO3)	Proposed limit (JZ and TO3)
NOx (95% of the time)	5 g/s	10 g/s	15g /s
NOx (5% of the time)	12 g/s	24 g/s	36 g/s

Note: Combined total NOx emissions rate from both incinerators during normal operations (note: these licence limits do not apply during start-up operations, particularly in relation to the JZ incinerator).

Slight increases in emissions of NH_3 and HCN are also expected under normal operating conditions with proposed revised limits provided in Table 4.

Table 4: Proposed limits for NH_3 and HCN compared to limits of existing licence (L6110/1990/13)

Parameter	JZ and Maxitherm		TO3	
	Current limit	Current target	Proposed limit	Proposed target
NH_3	N/A	0.6 g/s	N/A	1.2 g/s
HCN	0.3 g/s	0.21 g/s	0.5 g/s	0.42 g/s

Minor fugitive emissions can also occur during routine operations when vessels and process equipment are vented prior to maintenance. These activities are managed in accordance with established industry procedures to minimise gas release and prevent potential occupational health and environmental impacts. Fixed gas monitors will be installed within SCP2 to continuously monitor for HCN, methane (CH_4) and NH_3.

5.1.2 Start-up

Emissions during the start-up of SCP1 or SCP2 are currently vented through dedicated “start-up stacks” (also known as vent stacks) located downstream of the reactor and upstream of the absorber column. Start-up emissions include HCN and NH_3. Only one liquid plant undergoes start-up at any given time.

To ensure adequate dispersion of start-up emissions, and minimise potential impacts at sensitive receptors, the licence restricts start-up activities under certain meteorological

conditions.

As part of the proposed upgrade, an absorber bypass will be installed that conveys start-up gases to the incineration units for destruction. SCP1 start-up gases will be processed through the existing John Zink incinerator, while SCP2 will use the new TO3 incinerator and associated stack. This is expected to significantly improve emissions management during start-ups by eliminating direct venting of HCN and NH_3 during normal start-ups. As a result of this upgrade both SCP1 and SCP2 "start-up stacks" will be decommissioned.

In the event of an incinerator trip during start-up, waste gases will be discharged via the existing shut-down stack ("waste gas stack") in accordance with Condition 1(b) of the Licence. The frequency of start-up events is not expected to change as a result of the proposed Stage 2 modifications.

5.1.3 Waste gas venting

Waste gas venting occurs when SCP1 and SCP2 are operating but the incinerators are offline. Planned shut-downs of the incinerators are normally scheduled to occur when the plant is shut down, however, there are instances when incinerators become unavailable, such as during emergency maintenance or an incinerator trip. In these situations, scrubbed gases downstream of the absorber are released to the atmosphere via the "shutdown stack" (waste gas stack/vent).

The recent installation of a combined header system enables emissions from either plant to be redirected to the remaining operating incinerator. When venting takes place, production throughput is automatically reduced by 30–50% to match the capacity of the incinerator that remains online. Venting only occurs during the transition of waste gas to the running incinerator and continues whilst waste gas production exceeds the capacity of the incinerator; typically lasting 10 minutes.

Emissions from the incinerators during these events are expected to comply with the limits specified in Table 3, which provide allowances for upset conditions (<5% of the operating time).

5.1.4 Shut-down & Plant trips

During a plant shutdown (planned or trip), the reactor gases downstream of the mixer through to reactor, absorber column and shutdown stack are purged with nitrogen gas. The process takes eight minutes and the emissions timeframes during the purge is two to three minutes.

The emissions profile during shutdown or plant trip events are not expected to be impacted by the proposed Stage 2 works and will remain unchanged.

5.2 Air quality modelling

The applicant commissioned MRP Technical Consulting to undertake air quality modelling (MRP 2025) to evaluate potential impacts on sensitive receptors from the proposed works. The assessment modelled predicted concentrations of NOx, HCN and NH_3 under normal operating conditions, start-up, waste gas venting, and shutdown or plant trip scenarios, and compared these results against relevant air quality criteria (Table 5). The cumulative impacts of emissions were assessed at receptors where ambient data is available. Modelling considers short-term, mid-term and annual averages for each of the modelled pollutants.

Table 5: Ambient air quality criteria.

Parameter	Averaging period	Criteria (µg/m³)	Reference
NOx	1 hour	151	NEPC 2021
	Annual	28	DWER 2019
HCN	1 hour	200	DWER 2019
	24 hour	9.2	ATSDR 2019
	Annual	0.73	DWER 2019
NH_3	1 hour	330	DWER 2019
	Annual	70	DWER 2019

5.2.1 Normal operations

As a conservative approach, modelling assumes that the plant is operating at the maximum proposed licence limits specified in Table 3.

Despite increased emissions, the modelling suggests that ground levels concentrations (GLC) for all pollutants are below the relevant guidelines at all modelled receptors under normal operating conditions (i.e. with proposed upgrades implemented).

5.2.2 Start-up conditions

Start-up emissions were modelled at maximum emission rates (Table 3), with gases routed through the associated incinerator (John Zink for SCP1 and TO3 for SCP2). In line with the existing operating strategy, air quality modelling considered scenarios where only one liquid cyanide plant undergoes start-up at a time. The other liquid plant and solids plant were assumed to operate under normal conditions at the existing and proposed licence limits. Modelling also assumes that a second solids plant is operating, which is subject of a future proposal and outside the scope of this application, increasing the conservative nature of the model results.

Predicted concentrations of HCN and NH_3 during start-up were well below their respective ambient guideline values (AGVs) at all sensitive receptors, with maximum levels representing approximately 32% of the HCN AGV and 53% of the NH_3 AGV. This contrasts with previous start-up scenarios, where venting led to exceedances requiring the restriction of start-ups under certain meteorological conditions.

For NOx, exceedances of the one-hour AGV were predicted under worst-case meteorological conditions; however, these scenarios assume continuous start-up emissions which do not reflect actual start-up events. Start-ups typically last less than one hour and only occur at night in accordance with existing licence restrictions.

The assessment considered the probability of an exceedance occurring to determine the actual risk of exceedances impacting sensitive receptors. Assuming nine startups each year (based on historical data) that occur for a one hour duration, the probability of an exceedance of NOx exceeding the AGV at the nearest sensitive receptor (Wells Park) is considered to be extremely low (less than 0.002%).

5.2.3 Waste-gas venting

GLCs of NOx and HCN were predicted to be below the ambient guidelines for NOx and HCN. Exceedances of the 1-hour NH_3 guideline were predicted at several receptor locations, with the highest cumulative GLC at the modelled receptors being 741 µg/m³ at Wells Park (approximately 225% of the 1-hour guideline). Based on an estimated 258 hours of venting per year and occurrence of worst-case meteorological conditions, the probability of an exceedance at the nearest receptor (Wells Park) is predicted to be ≤0.0081%.

The probability analysis was based on venting data from the 2024/2025 financial year. This period was chosen by the applicant as it provides a conservative basis for the assessment given that the recorded venting hours include the extended venting associated with commissioning the new waste gas crossover.

Modelling for waste gas venting assumes both SCP1 and SCP2 are online at a reduced rate (40%) and both plants are venting to atmosphere. As a worst case scenario, the modelling also assumes that both incinerators are online and emitting waste gas to atmosphere. Previous modelling assumed a peak emission rate of 63 g/s across the entire hour under the dual incinerator trip scenario. However, noting that this peak emission rate only occurs over 10 minute period when gas is vented, the updated modelling averages this peak emission rate of the entire house (10.5 g/s).

Simultaneous trips are considered extremely rare, with only 18 hours recorded between 2018 and 2025. The replacement of the Maxitherm incinerator with TO3, which offers improved reliability, is expected to further reduce the likelihood of such an event.

5.2.4 Shutdowns

The air quality assessment determined that shutdown events would not result in exceedance of NOx, HCN or NH_3 guideline values at any of the nominated receptors.

5.3 Human Health Risk Assessment

Matisons Toxicology Solutions (Matisons) was engaged by the applicant to conduct a Human Health Risk Assessment (HHRA) evaluating whether emissions during start-up, waste gas venting, and planned shutdown or plant trip events could pose risks to human health.

Using the modelled GLCs and ambient guideline values, the HHRA determines Hazard Quotients (HQs) to determine the potential risk to human receptors. HQs of 1 or below are generally considered to present negligible risk. HQ values under 10 are regarded as acceptable, while HQ exceeding 10, require further evaluation or investigation to determine the potential for adverse effects.

Two HHRAs were considered as part of this assessment:

- a 2024 HHRA (Matisons 2024), which informed the Part IV assessment for the Stage 2 works (refer to section 3.1.2) and evaluated emissions during similar operating scenarios such as normal operations, start-up/shut-down, and waste gas venting events using dispersion modelling to calculate HQs; and
- an updated HHRA (Matisons 2025) incorporating revised HQs derived from the 2025 air quality modelling.

The 2024 HHRA determined that most HQ values were below 10; however, scenarios involving multiple vent openings during waste gas venting (i.e. dual incinerator trip) showed HQs exceeding 10 at the site boundary and at Wells Park, which typically warrants further investigation. It is noted that these HQs are based on modelling which assume a peak emission rate of 63 g/s.

The updated HHRA determined HQs for waste gas venting scenarios less than 10. As discussed in section 5.2.3, this is based on the revised emission rate which considers that peak emission rate of 63 g/s will only occur for about 10 minutes rather than the full hour assumed in the modelling.

The applicant considers such scenarios to be highly unlikely following the replacement of the Maxitherm incinerator with the TO3 unit. The updated HHRA therefore concludes that direct health impacts to the surrounding community are unlikely. On the basis of the HHRA outcomes, adverse health effects in the nearby community are not anticipated.

5.4 DWER and Department of Health assessment

Review of the air quality assessment confirmed that the modelling has been undertaken consistent with the DWER *Air Quality Modelling Guidance Notes* (DoE 2006). The delegated officer notes that modelling includes some conservative assumptions regarding emission rates, plant operations and background data indicating that results are also conservative in nature.

Advice was sought from the Department of Health (DoH) with regards to the HHRA and potential impacts of the proposal on human receptors. DoH noted that most of the committed avoidance and minimisation measures outlined in the EPA Report 1725 (summarised below) now appear to be incorporated into the Part V licence (L6110/1990/13). Previous recommendations requested that, for the proposed real-time monitoring, an associated plan be developed and implemented which specifies contaminant trigger levels and response measures. DoH was unclear whether this recommendation had been enacted.

Avoidance measures:

- Not undertaking start-up operations when the wind conditions originate from 57 to 80 degrees (towards Wells Park).

Minimisation measures:

- Reduction in the number of start-ups per year.
- Start up to only occur between sunset and sunrise.
- Continuous monitoring of wind conditions during start up.
- Plant start-up will be halted if wind conditions change and are not consistent with the Part V licence.
- Introduction of downwind real time monitoring for every plant start-up.
- A reduction in waste gas emissions from reduced venting time through interconnection of waste gas lines from both liquid plants.
- A reduction in the number of shutdowns per year, due to operational improvements in processing.

DoH reviewed the Stage 2 expansion proposal for AGR's sodium cyanide facility, including the submitted HHRA based on previous (2024) air quality monitoring data (Matisons 2024). While DoH was generally reassured by the findings of the HHRA, it emphasised the importance of proactive community engagement to address concerns, noting that persistent odour, even without health risk, can cause stress and anxiety. DoH also noted that the applicant had (at the time) not updated the HHRA to reflect 2025 monitoring and modelling data, and expected DWER to review this dataset, recommending revising the HHRA using the new data and resubmitting it for review if DWER identified any deterioration in air quality.

The applicant has since submitted an updated HHRA which presents similar findings to the previous HHRA. As discussed above, the air quality modelling used to support the HHRA was considered acceptable and as such the delegated officer determined that no further referral of the updated HHRA was required.

6. 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.

6.1 Source-pathways and receptors

6.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during construction and operation of the upgrades which have been considered in this decision report are detailed in Table 6 below. Table 6 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 6: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Vehicle movements, earthworks, etc.	Air / windborne pathway	Works associated with plant upgrade do not require significant earthworks.
Noise		Air / windborne pathway	Construction noise will primarily involve installation of equipment and is unlikely to contribute to the operational noise. Construction activities will occur during live operation and planned shutdowns. Construction noise will be managed in accordance with a Construction Management Plan submitted and approved by the City of Kwinana.
Commissioning & Operation			
Air emissions	Increased production New TO3	Air / windborne pathway	Waste gases from SCP2 are treated via incinerator prior to discharge to atmosphere. This will be via TO3 and the JZ incinerator once the Maxitherm incinerator has been decommissioned. Emissions during start-ups directed to incinerators in the first instance, unless incinerator trip occurs and then waste gas will be vented. Results in a reduction in waste gas vented to atmosphere. Only one plant will be start-up at any one time with start-up activities limited to nighttime hours. Start-up activities regulated by existing conditions of Licence L6110/1990/13 and the Sodium Cyanide Plant Start Up and Waste Gas Venting Management Plan. Emissions from the incinerator stacks are monitored in accordance with the existing Licence conditions. This required continuous monitoring of NOx via a continuous monitoring system (CEMS) and quarterly stack sampling for HCN and NH_3. The applicant proposes to continue the same monitoring (CEMS and stack testing) on TO3. Installation of new incinerator (TO3) with increased combustion capacity and enhanced reliability compared to existing Maxitherm unit reducing the number of shutdowns and vented waste gas. TO3 will feature Low NOx burners, SNCR technology, and three-stage incinerator process
Odour		Air / windborne pathway	

Emission	Sources	Potential pathways	Proposed controls
			(NOxIDIZER technology) for control of NOx.
Noise		Air / windborne pathway	Use of acoustic attenuation on specific equipment as outlined in section 4. Decommissioning of existing infrastructure (Maxitherm incinerator).
Wastewater from cooling towers (blowdown)		Overland runoff or seepage	No discharge of wastewater on the premises. Wastewater from the proposed expansion will be managed in accordance with existing site practices and upgraded water management systems (approved under Works Approval W6952/2024/1). Wastewater from the premises is directed to the neighbouring CSBP premises where it is stored in containment ponds prior to discharge to the Sepia Depression Ocean Outfall Landline (SDOOL). Discharge of wastewater from that premises is managed under conditions of Licence L6107/1967/17, which specifies discharge limits and monitoring requirements, as well as Ministerial Statement 665 (MS665). Wastewater is subject to cyanide destruction to reduce cyanide concentrations to <1mg/L prior to transfer to the CSBP wastewater management system.
Spills/leaks of environmentally hazardous material and potentially contaminated stormwater	New NacN storage tank / TO3 containment areas	Overland runoff or seepage	The new storage tank will be designed to AS 4452 – The storage and Handling of Toxic Substances and situated within a concrete bunded area for collection of spills. No direct discharge of wastewater/spills will occur. Spills/leaks and potentially contaminated rainwater are either recycled into the process (where possible) or directed to the CSPB premises via the cyanide destruction unit for disposal in accordance with Licence L6107/1967/17. Direct discharge to CSBP's containment ponds may occur where water meets specific criteria.

6.1.2 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 7 and Figure 2 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 7: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Wells Park	1.2 km SW
Kwinana Golf Course	2.0 km E
Nearest residence (suburbs of Medina and Calista)	2.1 km E
Other sensitive premises within the above residential areas (as considered in air quality modelling)	Thomas Oval (1.9km NE) Wombat Wallow Childcare Centre (2.9 km E) Calista Primary School (3.3 km E)
Kwinana Motorplex	3 km NE
Environmental receptors	**Distance from prescribed activity**
Unidentified Threatened Ecological Community (TEC)	Intersecting southern part of premises
TEC: Tuart trees / woodlands	Within premises boundary, ~ 550 m north of proposed activity
Threatened and/or priority fauna: *Isoodon fusciventer* (Southern Brown Bandicoot/ Quenda) *Zanda latirostris* (Carnaby's Cockatoo habitat trees)	Occurring within premises boundary of Lot 20
Groundwater	~ 1.5 m AHD; about 2.5 – 3 mbgl
Resource Enhancement Wetland	1.2 km E
Cockburn Sound	1 km W

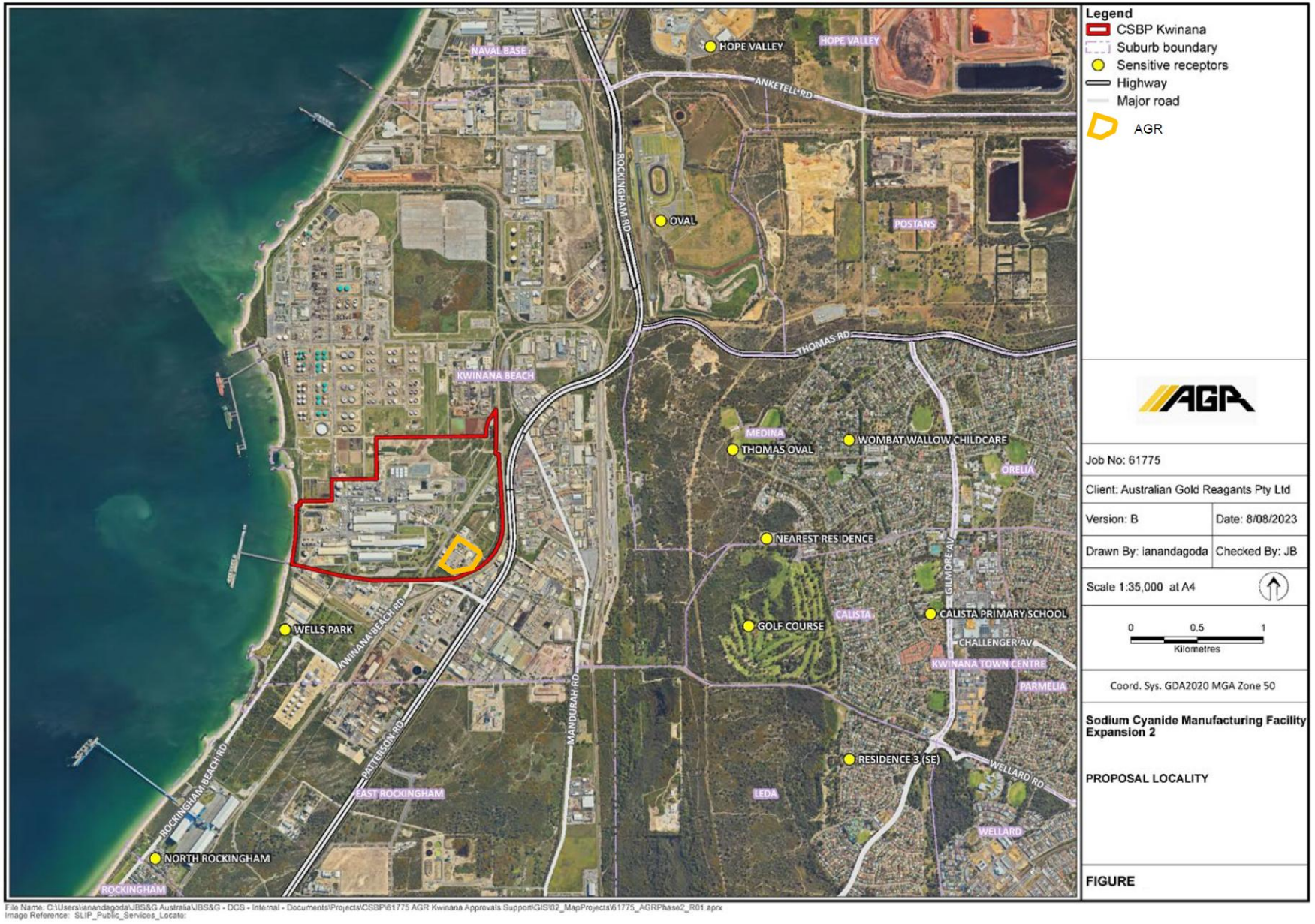

Figure 2: Distance to sensitive receptors

6.2 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 6.1. 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 6.1), 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 8.

Works approval W3088/2025/1 that accompanies this decision report authorises construction, commissioning and time-limited operations. The conditions in the issued works approval, as outlined in Table 8 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 8: 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	Justification for additional regulatory controls
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Excavations for foundations of air filters, air blowers, dump condenser, RO infrastructure including tanks, SCS switch room and condensate pump works	Dust	Air / windborne pathway causing impacts to health and amenity	Residences from 2.1 km E Well Park 1.2 km SW	Refer to Section 6.1.1	C = Minor L = Rare **Low Risk**	Y	N/A	The delegated officer notes that the proposed works will largely be undertaken within existing plant areas and do not involve extensive ground disturbing activities. Therefore, dust generation is not expected to be significant, and no additional regulatory controls are required.
	Noise			Refer to Section 6.1.1	C = Minor L = Rare **Low Risk**	Y	N/A	Construction noise is not expected to significantly impact off-site receptors considering the separation distance to these receptors and the location of the premises within an extensive industrial complex. Noise emissions occurring during construction works are managed under Noise Regulations (Regulation 13). In accordance with these regulations, a Construction Management Plan detailing measures to manage construction noise will be submitted to the City of Kwinana for assessment.
Commissioning and operation (including time-limited-operations operations)								
Increased production of NaCN (SCP2) – normal operation and upset conditions Operation of TO3 (replacing existing Maxitherm incinerator)	Emissions to air (NH_3, NOx, HCN, PM)	Air / windborne pathway causing impacts to health and amenity	Residences from 2.1 km E Well Park 1.2 km SW	Refer to Section 6.1.1	C = Moderate L = Possible **Medium Risk**	Y	Condition 1: Infrastructure requirements **<u>Condition 4: Specified actions (improvement plan)</u>** Conditions 5 - 11: Commissioning (commissioning plan, commissioning requirements including reporting.) Condition 15 – 24: Time limited operations including infrastructure controls, emission limits (TO3), monitoring and reporting.	The delegated officer considers that, while air quality modelling predicts occasional exceedances of assessment criteria at sensitive receptors, the likelihood of these exceedances occurring is low. Accordingly, the level of risk to sensitive receptors is not materially different from that identified in previous assessments and is considered acceptable. Infrastructure controls have been specified on the works approval including requirements for TO3 to meet specified design criteria (emission limits) and to install CEMS on the incinerator stack for continuous monitoring of NOx. Monitoring will be required through commissioning and time limited operations to verify the performance of the new TO3 to ensure it is achieving design. A commissioning plan will be submitted prior to commissioning outlining how emissions will be managed and monitoring through the commissioning phase. The delegated officer notes that the existing licence contains conditions for regulation air emissions from existing infrastructure including limits and/or targets for NOx, HCN and NH_3 emissions from the existing incinerators, emissions monitoring requirements and conditions relating to the start-up of plant and venting of waste gas. These conditions are considered suitable for managing emissions from the SCP2 plant upgrade. As part of the assessment, the delegated officer has also determined to include an improvement condition to ensure that previous commitments regarding air emission mitigation and the operation of the facility are progressed. These commitments were previously detailed in EPA assessment report 1725. The improvement condition will require the submission of plan detailing the implementation of any remaining minimisation measures proposed to mitigate air emission impacts to nearby receptors. In particular, the plan requires an investigation into the development of a monitoring campaign for the detection of air quality impacts downwind of the premises including specified trigger levels and management response in the event that triggers are exceeded. Detail within this plan is then intended to inform future licence amendment assessments where these minimisation controls can be conditioned.
	Odour	Air / windborne pathway causing impacts to health and amenity		Refer to Section 6.1.1	C = Minor L = Rare **Low Risk**	Y		The general odour threshold for NH_3 is approximately 5 ppm (ATSDR 2017), which is significantly higher than the ambient guideline value of 330 µg/m³ (equivalent to approximately 0.5 ppm). This indicates that the health-based AGV is more conservative than the odour detection threshold. Modelling indicates that during the short-term waste gas venting events, NH_3 GLCs may reach up to 225% above the AGV. However, the probability analysis estimates that the likelihood of an exceedance of the AGV for NH_3 is extremely low (0.0081%). While exceedances may result in NH_3 odour being detectable in some instances, it is considered unlikely to result in intense or widespread odour impacts, given the relatively high odour threshold. Start-up and venting activities are managed in accordance with the existing licence and premises Sodium Cyanide Plant Start Up and Waste Gas Venting Management Plan which includes continuous monitoring of meteorological conditions during venting events and downwind monitoring to determine downstream impacts, and response actions including community notifications if impact is considered likely.

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**				
								Considering this, the delegated officer determined that works approval conditions applied for the management of air quality impacts, combined with existing licence conditions and onsite management practices, are suitable for managing risks of odour.
	Noise	Air / windborne pathway causing impacts to health and amenity		Refer to Section 6.1.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1: Infrastructure requirements **Conditions 25-28: Noise validation and reporting**	As outlined in section 4, noise modelling determined that the proposed works are likely to achieve the assigned noise levels specified in the Noise Regulations. The delegated officer notes that modelled predictions are dependent on the implementation of a number of proposed noise reductions including replacement blowers equipped with silencers and enclosures. As such, infrastructure controls are included on the works approval specifying noise controls. Recognising that noise modelling is predictive and subject to uncertainty, the works approval includes conditions requiring verification monitoring to confirm model accuracy. Based on the monitoring results, the applicant is required to submit an updated noise model demonstrating compliance with the assigned levels under the Noise Regulations. Should the updated noise model indicate that the requirements of the Noise Regulations cannot be achieved, the applicant is required to identify any measures necessary to achieve compliance. Given decommissioning of the Maxitherm incinerator is key to achieving noise reductions, the delegated officer considers it most appropriate for noise validation work to occur after decommissioning is completed. This approach ensures that the updated noise model accurately reflects the current operational configuration of the premises.
	Wastewater from cooling towers (blowdown)	Overland runoff or seepage, potentially causing ecosystem disturbance or impacting surface water quality	Groundwater 2.5 mbgl Resource Enhancement Wetland 1.2 km E TEC 550 m N of activity Cockburn Sound 1 km W	Refer to Section 6.1.1	C = Moderate L = Unlikely **Medium Risk**	Y	N/A – Managed under Licence L6110/1990/1	The proposed works include infrastructure controls for the containment and management of spills, leaks and potentially contaminated stormwater (e.g. bunding, level alarms, etc.) which are specified on the works approval. No wastewater is discharged onto the premises with collected waste streams recycled through the process or directed to the neighbouring CSBP premises for further treatment and disposal via the SDOOL. The delegated officer notes that the existing licence (L6110/1990/13) includes conditions for management wastewater discharges. Further regulatory controls are applied through licence L6107/1967/17 and MS665 relating to the management and disposal of wastewater once at the CSBP premises. The delegated officer considers that the proposed infrastructure controls as part of this works approvals, and the existing operational controls under these regulatory instruments are sufficient for managing associated risks.
Increased production of NaCN (SCP2) – normal operation. (Loss of containment from additional tanks, pipes, pumps, etc.)	Spills of liquid NaCN / contaminated stormwater			Refer to Section 6.1.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1: Infrastructure requirements	

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.

7. Consultation

Table 9 provides a summary of the consultation undertaken by the department.

Table 9: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 9 October 2025	One submission received. Refer to Appendix 1.	
Local Government Authority advised of proposal on 9 October 2025	No response.	N/A
Department of Health advised of proposal 9 October 2025	Refer to section 5.4 above.	
Other Stakeholders (e.g. DLGIRS, Kwinana Industries Council) advised of proposal on 9 October 2025	No response	N/A
Applicant was provided with draft documents on 28 January 2026	Refer to Appendix 2	

8. Conclusion

Based on the assessment in this decision report, the delegated officer has determined that the proposal does not present an unacceptable risk to the environment or public health. Accordingly, a works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

The applicant's proposed controls have been assessed as generally suitable and effective for managing the identified risks associated with emissions and discharges. Key infrastructure controls have been incorporated as conditions within the works approval.

To verify the noise model predictions, noise validation monitoring has been required through conditions on the works approval. This includes undertaking on-site noise validation monitoring, with the results used to refine the noise model and provide more accurate predictions of noise contributions from the premises once the works have been implemented. Noise validation is required to be conducted following the decommissioning of the Maxitherm incinerator, as this represents a key noise reduction measure and will ensure the monitoring results most accurately reflect post-works emission levels from the premises.

Conditions have been included on the works approval authorising the commissioning of TO3. This is limited to the period of commissioning and testing of TO3 as outlined in Table 2 to verify it's performance. The applicant is required to submit a commissioning plan three (3) months prior to the commencement of commissioning TO3 outlining the proposed commissioning activities and measures in place to manage emissions during this period, including emissions associated with start-ups and upset conditions. The commissioning plan is also required to specify the proposed monitoring program for validating air emissions from TO3 during the commissioning period.

Noting that CEMS will be installed on the TO3 stack, specific conditions relating to the certification and validation of the CEMS in accordance with the CEMS Code have also been applied with requirements for reporting and submission of a quality assurance plan to ensure ongoing maintenance and calibration of CEMS.

The applicant is required to submit a licence amendment for the continued operation of TO3

following successful commissioning. The works approval authorises a period of time limited operation allowing operation through this transitional period when an application for a licence is being assessed. Refurbishment of the existing JZ incinerator can occur during this period. Noting the timeframe for decommissioning of the Maxitherm incinerator, which occurs at the completion of these refurbishments, time limited operations are authorised for a period of 12 months. This ensures that the licence amendment is able to address the removal of decommissioned infrastructure such as the Maxitherm incinerator and start-up (vent) stacks.

The delegated officer notes that the remaining Stage 2 works (debottlenecking) relate to existing infrastructure which are subject to conditions under the existing Licence (L6110/1990/13). The delegated officer considers that existing licence conditions are adequate for managing risks associated with commissioning and operation of these works and as such no specific conditions have been applied on the works approval relating to the commissioning and TLO for this infrastructure.

References

1. Agency for Toxic Substances and Disease Registry (ATSDR) 2019, *Medical Management Guidelines for Ammonia*, , available at: Ammonia | Medical Management Guidelines | Toxic Substance Portal | ATSDR
2. Department of Environment (DoE) 2006, *Air Quality Modelling Guidance Notes*, Perth Western Australia.
3. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
4. Department of Water and Environmental Regulation (DWER) 2019, *Guideline: Air Emissio*ns (Draft), Perth, Western Australia.
5. DWER 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
6. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
7. Matisons Toxicology Solutions 2024, *Addendum to Kwinana Sodium Cyanide Manufacturing Facility Upgrade Human Health Risk Assessment*.
8. Matisons Toxicology Solutions 2025, *Kwinana Sodium Cyanide Manufacturing Facility Upgrade Human Health Risk Assessment*.
9. MRP Technical Consulting Pty Ltd (MRP) 2025, *Wesfarmers Chemicals, Energy & Fertilisers, AGR Model Update and Emissions Verification Report*.
10. National Environmental Protection council (NEPC) 2021, National Environmental (Ambient Air Quality Measure) Protection
1. SLR Consulting Australia (SLR) 2024, *Sodium Cyanide Expansion Project Noise Impact Assessment: Australian Gold Reagents*.

Appendix 1: Summary of stakeholder comments

Submitter	Summary of stakeholder comment	Department's response
Public submission	Noise: 1. The acoustic model assumes a uniform ground-cover and does not incorporate the complex topography of the KIA, nor the presence of the railway line and major arterial roads that can reflect or amplify sound. 2. While the report focuses on operational noise, the construction phase will involve heavy earth-moving equipment, pile-driving, and concrete work. It was raised that these activities may impact nearby residences for short periods and no mitigation plan (e.g., acoustic enclosures, restricted working hours) is described. 3. The KIA hosts multiple industrial facilities, each contributing to the ambient soundscape. The additive effect of several sources operating simultaneously can push the overall noise environment beyond the regulatory threshold, even if each individual source complies.	1. The department undertook a technical review of the submitted noise modelling and determined that methodologies and assumptions used are appropriate. 2. Requirements for the development of a Construction Noise Management Plan are provided within the Noise Regulations. A Construction Management Plan addressing noise emissions during construction will be submitted to the City of Kwinana for approval. 3. Cumulative noise levels are regulated through the Noise Regulations under regulation 7(1)(a), which requires that the noise emissions from a premises must not significantly contribute to an exceedance of the assigned level. In accordance with regulation 7(2), an emission is taken not to significantly contribute if it is at least 5 dB below the assigned level. It is acknowledged that despite these requirements cumulative noise emissions from several premises may, at times, result in combined noise levels higher than the assigned levels. In the case of the proposed Stage 2 works, results of modelling that indicate the requirements of the Noise Regulations regarding cumulative noise would be met.
	Air quality: 1. The modelling predicts exceedance of the 1-hour guideline for NH_3 (330 µg/m³) at Wellard Road. Although the applicant argues that dual-incinerator trips are rare, the historical record shows 258 h of waste-gas venting in the 2024/25 financial year, with 122 h attributed to unplanned venting. Even a modest increase in vent-frequency could raise community exposure substantially. 2. NH_3 is treated in the model as a well-mixed pollutant but ignores the possibility of localised "odour plumes" that can be perceived at concentrations well below the health guideline. 3. The submitter indicates that there are flaws with the probability estimates of start-up and waste gas venting scenarios and recommends that year-long exposure assumptions are replaced with stochastic simulations that reflect realistic start-up and vent durations, meteorological windows and observed frequency of dual-incinerator trips. 4. While the TO3 limits are generous, the model treats the Maxitherm-to-TO3	1. As discussed in section 5.2.3, the modelling assumed 258 hours of venting as a conservative estimate derived from 2024/2025 venting data which captured commissioning activities associated with commissioning of the interconnection line. The frequency of waste gas venting is not expected to change as a result of this proposal with the likelihood of dual incinerators trips expected to reduce due to higher reliability of the new TO3 incinerator. Sections 5.3 and 6.2 discuss the potential for impact to human receptors based on results of a HHRA. 2. The risk of odour impact has been considered in the assessment (refer to section 6) and determined to be low noting the conservative nature of the air quality modelling and high odour threshold for ammonia. 3. The proponent has assessed start-up and waste gas venting scenarios by modelling these upset conditions as continuous year-long operations. This approach is intentionally conservative, ensuring that potential impacts are not underestimated. In addition, the proponent has provided probability estimates of exceedances to support the assessment (refer to section 5.2).

Submitter	Summary of stakeholder comment	Department's response
	transition as a worst-case scenario, assuming the TO3 operates at its maximum permitted NO_x output. However, the NO_x limit for the TO3 is expressed as a mass flow rate rather than a concentration, and the conversion to ground-level concentrations depends heavily on stack temperature, plume rise and atmospheric stability. It was raised by the submitter that the cooler temperate of the new incinerator (TO3) may reduce plume buoyance resulting in increased ground level concentrations under stable nocturnal conditions. The submitter claims that this has not been considered in the modelling and recommends that further sensitivity analysis is undertaken to analyse varying stack temperature, exit velocity and atmospheric stability 5. The submitter claims that the conservative approach applied to the cumulative assessment (whereby the model assumes all outside industrial sources operate simultaneously) inflates background emissions and potentially masks incremental contributions from the proposed expansion. Furthermore, it claims that the model does not account for possible future reductions from neighbouring sources such as the scheduled shutdown of the Alcoa refinery and that the effect of these opposing cumulative exposure trends is unclear. 6. The submitter requested continuous NH_3 analysers at the most affected receptors (Wells Park, Wellard Road, Thomas Oval) with data made publicly available. Triggers for automatic shutdown should also be included. 7. Although noted that SNCR technology is proposed, it was requested that the feasibility of additional controls are investigated including low NOx burners or tertiary after-treatment especially during start-up when fuel-rich combustion is likely. 8. It was raised that the HHRA does not explicitly address acute, short-duration spikes that are characteristic of venting events. The HQ calculation used in the HHRA uses chronic exposure guidance values (e.g., annual guideline for NH_3 of 70 µg/m³). Acute exposure to NH_3 can cause respiratory irritation at concentrations as low as 20 µg m^{-3} for sensitive individuals. It was recommended that the chronic HHRA be supplemented with an acute risk assessment that evaluates peak NH_3 and HCN concentrations over 10-minute intervals, using the short-term exposure limits (NO_2 151 µg/m³ 1-hour, NH_3 330 µg/m³ 1-hour). 9. Residents are simultaneously exposed to NO_2, NH_3, and trace HCN. While each pollutant individually falls below its respective guideline, synergistic irritation effects are documented in epidemiological studies of industrial	This is considered to be an appropriate method for evaluating such scenarios and aligns with the requirements outlined in the *Air Quality Modelling Guidance Notes* (DoE 2006). Therefore, further stochastic simulations are not considered necessary, as the current approach provides a conservative estimate of the ambient air quality concentration associated with these events. 4. The proponent has modelled the new incinerator (TO3) using the lower stack temperature, and therefore the predicted GLCs reflect the potential effects of reduced plume buoyancy under cooler operating conditions. Consequently, the modelling has accounted for the scenario raised. 5. All modelling assessments are required to meet the requirements of the *Air Quality Modelling Guidance Notes* (DoE 2006). As stated above, the modelling approach used in this assessment is generally acceptable and aligns with the guidance notes. The approach adopted in the cumulative assessment, which assumes that all external industrial sources operate simultaneously, results in conservative predictions of GLCs, including the incremental contributions from the proposed expansion. The delegated officer considers this as a conservative approach. Regarding the submitter's comment about the model not accounting for possible future reductions from neighbouring sources, the delegated officer considers any future reductions in emissions from neighbouring sources would lead to lower cumulative GLCs, thereby reinforcing the conservative nature of the current modelling approach. 6. The works approval includes conditions requiring the applicant to investigate the development of a monitoring campaign at sensitive receptor locations. The plan is required to provide details of the proposed monitoring program as well as trigger levels for contaminants with response action if exceeded. Furthermore, the plan shall consider advice provided by DWER and DoH. Implementation of the plan will be addressed through the licence. 7. TO3 includes a number of design features targeted a minimising the formation of NOx during the combustion process. These include: • Low Nox burners; • SNCR technology; and • NOxIDIZER technology which. The applicant also proposes to install an absorber by-pass line directing

Submitter	Summary of stakeholder comment	Department's response
	precincts. The HHRA treats each contaminant independently, potentially underestimating combined health impacts. It was recommended that a weighted irritation index be applied (e.g., the European Union's Integrated Exposure-Response framework) to assess combined effects of NO_2, NH_3, and HCN on the respiratory tract. 10. The assessment assumes a static population that spends 100 % of its time outdoors at the receptor location. This is a conservative exposure assumption for chronic risk but does not capture vulnerable sub-populations (children, elderly, asthmatics) who may spend more time outdoors during school or recreation. It was recommended that a baseline health survey of the surrounding neighbourhoods be established (particularly schools and childcare centres) and a longitudinal monitoring programme to detect any uptick in respiratory complaints after the expansion becomes operational.	waste gas to the incinerators during start-up events and reducing the amount of waste gas vented directly to atmosphere. Conditions have been applied on the works approval requiring the implementation of these specified controls in addition to set emission limits. NOx emissions from TO3 will also be continuously monitored via a CEMS to verify system performance and confirm that emissions remain within modelled parameters. 8. Short term impacts were considered in the air quality modelling, and subsequent HHRA, through the application of the 1-hour ambient guideline for NOx, HCN and NH_3 (151ug/m^3, 9.2 ug/m^3 and of 330ug/m^3 respectively). 9/10 The methodology used to develop the HHRA has been reviewed by the DoH and deemed appropriate for assessing risks to human health. The delegated officer notes that the air quality modelling undertaken to inform the HHRA adopts conservative assumptions regarding emission rates, operational scenarios and background concentrations, and is therefore considered appropriate for assessing potential impacts (refer to Section 5.2). The EPA has previously considered potential human health risks associated with emissions from the premises as part of its Stage 1 and Stage 2 assessments (EPA Report 1725), concluding that, with the implementation of identified avoidance and minimisation measures, human health impacts are not expected to be unacceptable and can continue to be effectively managed under Part V of the EP Act. To address the remaining recommendations arising from the EPA assessment and DoH advice, the works approval includes a requirement to investigate the development of monitoring campaign, including contaminant trigger levels and associated response actions. When considered alongside the existing monitoring requirements under the current licence, additional monitoring imposed through this works approval, these measures are considered sufficient for managing identified risks.
	Odour: Ammonia venting episodes have historically generated odour complaints. The HHRA acknowledges that odour may be detectable during dual-incinerator trips, but no formal odour-impact study is presented. Community perception of risk can be as consequential as measured risk. The submitter requested that a quantitative odour-impact assessment be conducted (e.g., using dynamic	As discussed in section 5.2.3, likelihood of a dual incinerator trip is considered to be extremely low with this likelihood reducing further with the replacement of the Maxitherm incinerator with the new TO3 incinerator which provides improved reliability. Odour risks have been considered in section 6 and determined to be low, considering the likelihood of emissions, associated odour thresholds and emission controls.

Submitter	Summary of stakeholder comment	Department's response
	olfactometry) at the most sensitive receptors and publish the results	
	Wastewater: 1. The cyanide destruction unit is a critical control point. Any upset (e.g., loss of peroxide dosing, pH drift) could result in cyanide breakthrough. The documentation does not specify redundancy (parallel reactors) or automatic fail-safe diversion to an alternate treatment path. Installation of a parallel cyanide destruction train or a standby emergency treatment system was requested that can be activated instantly if the primary unit deviates from set-points. 2. The submitter noted that wastewater samples are taken "once per shift" for cyanide concentration. Given the potential for rapid spikes during start-up or venting, a higher frequency (e.g., continuous online cyanide sensors) would better assure compliance. Inline cyanide analysers with alarm thresholds set at 0.5 mg/L were recommended, feeding data to the plant control system and to a publicly hosted dashboard.	1. The delegated officer notes the stakeholder's concern regarding potential cyanide breakthrough in the event of process upsets within the cyanide destruction unit. The Expansion Project does not alter the applicant's existing cyanide destruction process, which operates as a batched system with each batch sampled and analysed for pH and cyanide prior to discharge to CSBP's wastewater system under the current licence requirements. In addition to batch verification, the applicant operates an online boundary analyser that provides real-time monitoring of cyanide concentration and pH, with continuous feedback to the plant control system and automated shutdown if parameters fall outside defined limits. This approach ensures that any waters that do not meet licence criteria are retained for re-treatment prior to discharge. As such, the existing operational controls are considered sufficient to manage the risk without the need for additional parallel treatment trains or emergency standby systems. 2. The delegated officer considers that the existing regulatory controls applied through the existing regulatory instruction for the premises (L6110/1990/13) and neighbouring CSBP premises which receives and disposes of contaminated wastewater (Licence L6107/1967/17 and MS665) are suitable for regulating risks associated with wastewater discharges. These include requirements for monitoring and set emission limits.
	Greenhouse gas emissions: The TO3 is advertised as reducing N_2O emissions relative to the Maxitherm unit, yet the overall CO_2-equivalent (CO_2-e) emissions are projected to stay within the licence ceiling of 97 460 t CO_2-e per year. Given Western Australia's net-zero target for 2050, any increase in fossil-fuel combustion should be scrutinised. It was requested that the applicant be required to submit a cradle-to-gate carbon inventory for the expanded plant, including upstream natural-gas extraction and downstream product transport, and to identify opportunities for renewable-energy substitution.	The delegated officer notes that the applicant proposes to maintain GHG Scope 1 and Scope 2 emissions below 100,000 CO_2-e. The delegated officer did not further consider GHG emissions as they were considered by the Environmental Protection Authority for the referred proposal (refer to section 3.1) and are beyond the current scope of the department's published risk-based regulatory framework for assessment and regulation under Part V of the EP Act.

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

Condition	Summary of applicant's comment	Department's response
Condition 1 (Table 1)	Item 6 - The applicant requested that the total volume of the cyanide storage tank be increased by 1% from 5,400m3 to 5,453m3.	The delegated officer considers the small increase acceptable noting that existing controls are suitable for managing risks associated with the chemical storage.
	Item 9 – minor changes as follows: • Reference to NOx updated to reflect NOx (as NO_2); and • Modifications to wording of condition h(ii) to align with the CEMS Code.	Accepted and conditions undated accordingly.
Condition 4 (Specified actions)	The applicant requested changes to the condition as follows "The works approval holder must, within ~~twelve~~12 months of the granting of the works approval, prepare and submit to the CEO, an improvement plan for the ongoing minimisation of impacts to air quality from operations at the premises (ALARP)."	The delegated officer has updated the condition accordingly except for reference to "ALARP" which is considered is not considered necessary for the purposes of the condition. Minimisation measures referenced in the condition are documented in EPA Report 1725.
Condition 6(e)	Requested wording change as following to align with wording of the CEMS Code: "the timeframes and procedures for the ~~commissioning, certification and verification~~ performance testing of the installed CEMS in accordance with the CEMS Code.	Accepted and conditions undated accordingly.
Condition 10	The applicant requested that the CEMS Calibration Report be submitted within 60 (rather than 30) days of successful calibration to allow sufficient time for internal review processes.	
Condition 11(c)	Change wording of the condition as follows to allow flexibility in the event of issues occurring during calibration and verification: "details of the successful calibration and verification of the installed CEMS system, as ~~conducted~~ commenced within 500 operational hours of TO3 in accordance with Phase III of the CEMS Code"	
Condition 13 (c)	Wording update to include reference to "Phase IV" similar to the CEMS Code to improve clarity.	

Condition	Summary of applicant's comment	Department's response
Condition 17 (Table 3)	The applicant queried whether emission stacks associated with the existing incinerators need to be included.	Emissions from the existing infrastructure is regulated under the conditions of licence L6110/1990/13 and therefore do not need to be included on the works approval.
Condition 18 (Table 4)	The limit included for NH_3 is not consistent with the Amendment Report which specifies this value as a target. Requested that the limit be changed to a target.	The limit for NH_3 has been removed as requested and replaced with a target applied under Condition 22 (Table 5). A target has also been included for HCN consistent with Table 4. Reporting of monitoring results against the specified target is included in Condition 24.
Condition 19	The applicant requested changes to the wording to ensure that CEMS availability requirements do not apply when the plant is not operating.	Noted and condition updated accordingly.
Condition 20	Requested removal of requirement to maintain monitoring equipment in accordance with the manufacturer's specifications to remove confusion around which specification to use.	The requirement to follow both the manufacturer's specifications and the CEMS Code reflects that each serves a different purpose. Manufacturer specifications ensure the equipment is operated and maintained in a way that supports reliable performance, while the CEMS Code sets the regulatory standards needed for high-quality compliance data. Together they help ensure the monitoring equipment can meet its intended function. Removing the reference to manufacturer specifications would reduce clarity around basic operational requirements and therefore the delegated officer has retained this requirement.
Condition 22	Requested inclusion of a note allowing use of alternative relevant US EPA or NATA accredited testing methods.	Note added. The delegated officer considers that equivalent methods determined by the US EPA or which are NATA accredited testing methods would be appropriate for use.
Condition 25 / Condition 27	The applicant requested additional time to complete these actions to ensure sufficient time to engage the noise consult and undertaken internal review processes.	The slight extension to the timeframe is considered acceptable and conditions have been updated accordingly.
Other	Various administrative and typographical errors have also been amended.	