Decision Report

Application for Works Approval

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

Works Approval Number	W6915/2024/1
Applicant	CSBP Limited
ACN	008 668 371
File number	DER2024/000131
Premises	CSBP Limited KWINANA BEACH, WA 6167 Part of Lot 20 on Diagram 78086, Volume 1918 / Folio 244 and Part of Lot 18 on Plan 17311, Volume 2058 / Folio 310 As defined by the premises map attached to the issued works approval.
Date of report	30 September 2024
Decision	Works approval granted

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MANAGER, PROCESS 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 the proposed increase in production capacity of nitric acid, ammonium nitrate and ammonium nitrate emulsion through upgrades to existing infrastructure at the licensed (L6107/1967/17) CSBP Limited chemical and fertiliser production facility in Kwinana Beach. As a result of this assessment, works approval W6915/2024/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this decision report, the Department of Water and Environmental Regulation (the department; DWER) has considered and given due regard to its regulatory framework and relevant policy documents which are available at DWER Regulatory documents | Western Australian Government (www.wa.gov.au).

2.2 Application summary and overview of premises

CSBP Limited (CSBP; the applicant) is a subsidiary company of Wesfarmers Chemicals, Energy & Fertilisers (WesCEF) and holds a licence (L6107/1967/17) for the CSBP Kwinana integrated chemicals and fertiliser manufacturing facility located at Part of Lot 20 on Diagram 78086 and Part of Lot 18 on Plan 17311 (the premises), in Kwinana Beach.

On 21 February 2024, the applicant submitted an application for a licence amendment to the department under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act) for its debottlenecking project and associated increase in production capacity. Due to the scale of the proposed works, it was determined to process the application as a works approval under section 54 of the EP Act.

In April 2023, works approval W6778/2023/1 was granted authorising an upgrade to the Selective Catalytic Reactor (SCR) at Nitric Acid Ammonium Nitrate (NAAN) Plant 3 (NAAN3). The applicant now proposes to undertake similar works relating to tertiary abatement and the construction and installation of debottlenecking infrastructure at NAAN1 and NAAN2, thus increasing nitric acid and ammonium nitrate production. The applicant also proposes to increase ammonium nitrate emulsion (ANE) production through an increase in operation hours at the ANE Plant. Details of the components of the application are summarised in Table 1.

Table 1: Components of works approval application

	Proposed works	Details of proposed works relevant to Part V of the EP Act	Anticipated outcome of proposed works
1.	Installation of new tertiary catalyst reactors at NAAN1 and NAAN2	To manage the emissions to air from the increased production from proposed bottlenecking works (see below), the applicant proposes to install a new tertiary catalyst reactor that replaces the existing SCRs in NAAN2 and NAAN3. The SCRs treat tail gas from the NAAN Plants prior to its discharge to air via a stack to reduce the emission of N_2O to the atmosphere. The new tertiary catalyst reactors are anticipated to increase the N_2O abatement from 85% to 95%. The proposed works involve the replacement of internal baskets within the SCR with the new tertiary abatement catalyst. This will be implemented in stages with one NAAN Plant completed at a time. The staged implementation is to align with plant shutdown periods.	Emissions abatement to compliment the debottlenecking works that will result in a decrease in N_2O and NOx.

	Proposed works	Details of proposed works relevant to Part V of the EP Act	Anticipated outcome of proposed works
2.	Debottlenecking works at NAAN1, NAAN2 and NAAN3	Following the implementation of the above air emission tertiary abatement works, the applicant proposes that debottlenecking of the NAAN Plants will be carried out to enable production increase. The proposed debottlenecking project incorporates an upgrade of the existing air compressor and expander units with associated piping, air intake cooling and other efficiency upgrade modifications. Of particular relevance to this application, due to its potential as an additional noise source, is the proposed installation of a new chilled water (created by vapour absorption machine (VAM)) system and cooling tower unit at each NAAN Plant. This will supply chilled water to the top section of the absorber that provides cooling duties to increase nitric acid production and precool the inlet air to the air compressor for each of the NAAN Plants.	Increased nitric acid (NA) and ammonium nitrate (AN) production (819 t NA per day per plant). This will increase the chemical manufacturing (category 31) capacity from 3,712,000 to 4,070,800 tpa.
3.	Works to support increased operation hours at the ANE Plant	The applicant proposes to increase ANE production by increasing operation hours from day-shift only to a 24-hour operation. It is anticipated this will enable the manufacture of up to 262,800 tpa of emulsion product, including alternative formulations to meet market demand. Works and infrastructure associated with increased operation include new storage tanks, load-out station, extension of the existing bunded concrete hardstand and the addition/modification of pumps, pipework and process control system to integrate the new reagent and product storage tanks.	Increased ANE production. This will increase the chemical blending (category 75) capacity from 100,000 to 262,800 tpa.
4.	Construction and installation of additional load-out, receival and storage facilities	The applicant proposes to expand its nitric acid load-out infrastructure and enable the acceptance of third-party ammonium nitrate solutions (ANSol) for use in chemical manufacturing processes. Works and infrastructure associated with this includes the addition of storage tanks and associated pumps and hardstands, a new vehicle loading station and a new ANSol receiving station.	Improved efficiency and storage buffering capacity, enabling greater decoupling of nitric acid and ammonia nitrate processes.
5.	Works associated with ammonia storage flare connection to ammonia plant flare	Fugitive ammonia emissions from the Ammonia Storage Tanks are combusted through a flare on top of Ammonia Storage Tank 2. When maintenance of the Ammonia Storage Flare (ASF) occurs there is an increased risk of venting unburnt ammonia to the atmosphere. This risk is currently managed with operational controls and diversion of small ammonia releases into a water tank while the flare is under maintenance. The ammonia plant flares fugitive process gas through a separate ammonia plant flare (APF), only during upset conditions. The applicant proposes to connect the ASF to the APF system so that the ASF feed (purge gas from the ammonia storage tanks) can be diverted to the APF for short periods, allowing isolation of the ASF system for maintenance and inspection.	Mitigate risk of fugitive ammonia emissions to atmosphere during ASF maintenance.

The premises relates to the categories and assessed capacity under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in works approval W6915/2024/1. The infrastructure and equipment relating to the premises category and any associated activities which the department has considered in line with *Guideline: Risk Assessments* (DWER 2020) are outlined in works approval W6915/2024/1.

3. Legislative context

3.1 Part IV of the EP Act

CSBP holds Ministerial Statement 689 (MS 689) and Ministerial Statement 875 (MS 875) associated with the Kwinana Ammonium Nitrate Production Facility expansion project. An amendment to MS 875 regarding phase 2 of the debottlenecking project was referred to the Environmental Protection Authority (EPA) under section 45C (s.45C) of the EP Act and granted in March 2024. MS 875 Condition 1 requires the proponent to implement the proposal as documented and described in schedule 1.

The key changes to the proposal approved under s.45C as outlined in schedule 1 include:

- debottlenecking at the three NAAN Plants;
- installation of tertiary N_2O abatement technology at NAAN1 and NAAN2;
- increasing ANE production capacity;
- increasing storage at the ANE Plant;
- construction of additional nitric acid and ANSol storage and load-out infrastructure and acceptance infrastructure for third-party ANSol;
- removal of storage capacity from the proposal elements;
- increasing water inputs;
- reduced NOx emissions; and
- clarification that power generation extent applies to each generator.

The delegated officer considers that the proposed works are consistent with the proposal that was assessed by the EPA and subsequently approved under MS 875. The applicant is required to comply with the greenhouse gas abatement conditions outlined in condition 5 of MS 875.

3.2 Rights in Water and Irrigation Act 1914 (RIWI Act)

Water for the industrial operations of the premises is sourced from the Kwinana Water Reclamation Plant (KWRP), groundwater and supplemented by scheme water. CSBP holds the following groundwater extraction licences granted by DWER under the Rights in Water and Irrigation (RIWI) Act 1914:

- Licence to take water GWL100798 (Superficial); 2,100,000 kL pa; and
- Licence to take water GWL100799 (Yarragadee); 2,500,000 kL pa.

As a result of the proposed debottlenecking works, operation of the twin water-cooling towers will require an additional 0.65 GL/annum (1,780 kL/day) of water. According to the application, the additional water requirements will be sourced within existing groundwater allocations, additional KWRP and supplemented by scheme water, if required.

3.3 Contaminated Sites Act 2003 (CS Act)

Lot 20 is classified under the *Contaminated Sites Act 2003* (CS Act) as 'possibly contaminated – investigation required'. A detailed site investigation (DSI) completed in 2020 listed the nature of the contamination as nitrogen, arsenic and hydrocarbons present in soil and groundwater, and noted the presence of co-mingled plumes related to both primary and secondary on and off-site sources. Therefore, there are several areas of the premises which require management to mitigate residual risks via a Contaminated Site Management Plan (CSMP). A Contaminated Sites Auditor is engaged for the site and has endorsed the finalised version of the CSMP.

The NAAN2 and NAAN3 infrastructure, including the proposed NAAN3 chiller unit infrastructure lies within the delineated arsenic plume management area identified in the CSMP. The chiller unit (chiller unit and cooling towers) require excavation to a depth of approximately 1.5 m below ground level for the establishment of footing and plinths. According to the applicant, excavation would need to exceed 2.5 m to encounter groundwater. Therefore, the principal concern when interacting with contaminated

soils is the exposure risk to workers and the subsequent management of the soil, rather than contamination of groundwater. The applicant has proposed that controls will be applied in accordance with the CSMP, as contaminated soil may be exposed during the works.

4. Air emissions

4.1 Air emissions profile

Emissions to air from the three NAAN plant stacks are primarily NOx and N_2O. Under normal operation and prior to debottlenecking, the average hourly NOx concentration is typically around 0.1 g/m^3 (per NAAN plant); below the licence limit of 0.41 g/m^3 per plant during operation (L6107/1967/17, condition A2(c)). There have been no exceedances of the start-up limit of 2.0 g/m3 NOx per plant (L6107/1967/17, condition A3(c)) in the last eight annual reporting periods.

The proposed abatement works include the addition of a tertiary catalyst reactor containing an iron zeolite catalyst (or a catalyst of similar performance), which will be installed in place of the existing SCR. The waste gas will contact the tertiary catalyst in the presence of ammonia and natural gas as a reducing agent, reducing NOx and N2O emissions to atmosphere from NAAN1 and NAAN2. NAAN3 already has approval (MS 875 and W6778) to implement similar tertiary abatement measures, which will be implemented during the next major plant shutdown period and is also anticipated to realise a reduction in NOx and N2O emissions.

There will be a minor addition of carbon monoxide (CO) and methane (CH_4) emissions associated with the tertiary abatement due to the introduction of the natural gas. No change to ammonia emissions from the NAAN plants are expected. Tertiary abatement will be installed prior to increasing production. The current and projected emissions associated with the expansion and debottlenecking are presented in Table 2.

Table 2: NAAN3 existing emissions and predicted emissions with tertiary catalyst reactor

Aspect	Units	Current	Expanded production	Expanded production with tertiary abatement	Comments
N_2O	ppm	142	190	25	Increase in N_2O with increased production, but ultimately a decrease in emissions due to tertiary abatement.
NOx		50	50	20	Stack emissions are expected to reduce to 20 ppm (manufacturer guarantee) but likely to be about 5 ppm during optimum tertiary abatement.
NH_3		<5	<5	<5	No change.
CO		0	0	150	Increase due to natural gas addition as reducing agent.
CH_4		0	0	150	

4.2 Applicant's air emissions assessment

The applicant conducted a screening analysis as per the draft DWER Guideline Air Emissions (draft guideline; DWER 2019), to predict a CO screening concentration (SC) to compare with an air quality guideline value (AGV) screening tolerance, which represents likely insignificant impacts assuming worst case conditions. The analysis, which was presented to the EPA in the s.45C amendment, confirmed that the introduction of CO emissions was insignificant, and so it will not be further assessed for this application. Methane was considered by the EPA (Ministerial Statement 875 and 689) as a greenhouse gas (GHG) and is regulated under Part IV of the EP Act. Although there will be an increase

in methane emissions, there will be a significantly larger decrease in N_2O emissions, the predominant GHG emission from the premises, resulting in an overall decrease in the premises GHG emissions. The change to the premises GHG emissions associated with tertiary abatement was considered for the s 45C amendment so will not be assessed or regulated as part of this works approval application.

Assessment of the impact of NOx emissions on air quality has previously been undertaken by the department for the grant of EP Act Part V works approval and licence for the premises, as well by the EPA under Part IV of the EP Act, and has been determined to be acceptable subject to the conditions within the existing licence relating to air emissions. As NOx emissions are anticipated to decrease as a result of the proposed addition of tertiary catalyst reactors, modelling of NOx emissions was not undertaken for the application.

5. Environmental noise assessment

The applicant engaged SLR Consulting Australia (SLR) to undertake an environmental noise assessment of the debottlenecking works at the three NAAN Plants. As the proposed project involves changes to existing equipment that affects noise emissions, a comparative sound power level assessment calculation was undertaken with existing and proposed modified/new equipment based on manufacturer information. For the acoustic modelling, the CONCAWE prediction methodology was utilised within SoundPLAN. The assessment has been provided with the application (SLR, 2024), which details the predicted change in noise levels at the residential areas surrounding the Kwinana Industrial Area (KIA) and an assessment of noise impacts against applicable noise limits from the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations).

5.1 Construction

Construction noise has not been considered in the environmental noise assessment. Construction noise associated with the NAAN plants will be of limited duration and completed one plant at a time. Some construction works will be undertaken pre-shutdown (e.g. chiller unit infrastructure) while upgrading/replacing components will require plant shutdown. Therefore, the applicant anticipates that general noise levels will be lower during the shutdown period as the plants will have reduced operations.

In the application, the applicant states that the ANE plant is not a major contributor of noise at the premises, and so an increase in operation hours will likely be absorbed within the existing noise profile. The noise levels generated from activities associated with the increasing of a hardstand area, installation of tanks and piping/tie-in infrastructure will be of short duration with minimal noise emissions. These works will be undertaken during the day.

5.2 Operation

The applicant anticipates that the main source of noise emissions associated with the proposed works will the operation of the three NAAN plants.

A comparative calculation of ‘worst case’ propagated sound from the NAAN location to Medina for the existing and proposed cumulative sound power of the three NAAN plants was undertaken. The calculation shows that the proposal is expected to result in a net 1.1 dB decrease in combined NAAN plant noise emissions at the most affected residential receptors at Medina residential area. This reduction in noise emission is associated with the proposed upgrade of the tail gas attenuator and improved lagging of compressor pipework, the latter affecting mainly higher frequency noise emissions.

The typical received noise level at Medina is therefore estimated to reduce from LA10 27 to 26 dB for the combined NAAN plants following the proposed debottlenecking project. The potential reduction in noise emissions under ‘worst case’ night conditions at Medina residential area is around 0.5 dB, which is considered insignificant.

The existing predicted noise levels at the premises are compliant with the night-time LA10 ‘assigned

level' at all residential receptors under 'worst case' climatic propagation conditions. The predicted small reduction in site noise emissions associated with the proposed NAAN debottlenecking project will therefore also result in compliant noise emissions.

5.3 DWER findings

The acoustic assessment itself notes that "*The site acoustic model is in the process of being upgraded to a more detailed model with identifiable individual noise sources*". Therefore, there are inherent limitations to the current acoustic model.

The delegated officer considers the modelling methodology used may be too simplistic to represent the multitude of noise sources present on site and has the potential to result in large uncertainties in the predicted results. It is therefore difficult to assess the veracity of the proposed noise reductions.

However, the conclusion that cumulative operational noise emissions will comply with the Noise Regulations appeared reasonable, noting the noise controls proposed by the applicant (see Table 3).

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 premises construction and operation which have been considered in this decision report are detailed in Table 3 below. Table 3 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 3: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Civil earthworks - vehicle movements, use of equipment / machinery and subsurface construction activities	Air / windborne pathway	Nil
Noise			Construction noise associated with the NAAN plants will be of limited duration and completed one plant at a time. The replacing/upgrading of NAAN plant components will require plant shutdown, and so noise levels will be lower at these times.
Spread of existing soils contaminated with nitrogen, arsenic and hydrocarbons		Excavation works spreading soil contaminated with nitrogen, arsenic and hydrocarbons, and infiltrating into groundwater	Any soils intersected will be treated as being contaminated, until laboratory analysis has proved otherwise, and managed in accordance with the CSMP developed for the site.

Emission	Sources	Potential pathways	Proposed controls
Operation			
Air emissions (NH_3, N_2O, NOx, CO, CH_4)	NAAN1 and NAAN2 debottlenecking and increased production rate	Air / windborne pathway	A tertiary catalyst reactor will be installed to reduce NAAN plant NOx and N_2O emissions. NAAN plant NOx emissions will be monitored on plant start-up to verify the emissions reductions are achieved (via existing SCR continuous emission monitoring system (CEMS) in accordance with condition A2(a) of licence L6107/1967/17). Continuous emissions monitoring of NOx from the NAAN stacks will continue to be carried out in accordance with licence L6107/1967/17.
Spent catalyst waste (containing heavy metals)		Direct discharge to land and infiltration to groundwater	The Iron Zeolite catalyst has a life expectancy of 15 years, and once it is reached the catalyst will be containerised and disposed of to a regulated landfill.
Nutrient-rich blowdown water (an increase of 100,000 kL/annum)	NAAN plant vapour absorption machine (VAM) and twin cooling towers	Discharge to marine environment via Sepia Depression Ocean Outlet Landline (SDOOL)	Collected wastewater (blowdown) is neutralised and then pumped to the nutrient stripping wetland system for further treatment before being discharged to the marine environment through the SDOOL under existing licence L6107/1967/17 condition M2(a). Sourcing additional good water quality supplies may reduce volumes needing to be managed. Nutrient concentration limits of discharged wastewater to SDOOL and Cockburn Sound are set out in Condition M5(a) of Licence L6107/1967/17. Quality of wastewater is not expected to change as a result of this amendment.
Noise		Air / windborne pathway	Upgrade of potential noise generating components, including the compressor/expander units and air intake cooling. Selection of lowest feasible noise equipment for components being replaced. Upgraded tail gas silencers on NAAN1-3 tail gas stacks. Upgraded acoustic lagging systems (acoustic insulation) on NAAN 1-3 air compressor/expander units. NAAN3 chiller unit placement is north of the plant, 9.5 m from the existing northern boundary acoustic mitigation wall. Selection of VAM technology (which has no moving parts so is free of noise and vibration) to provide chilling using steam which eliminates need for an air-cooled dump condenser (ACDC) which generates more noise. Acoustic insulation (lagging) will be installed on the chilled water supply and return line to reduce noise generated due to fluid velocities. Installation of variable speed drive for chiller unit cooling towers fans.

Emission	Sources	Potential pathways	Proposed controls
	Increased operation of the ANE plant from day-shift only to 24-hours		Nil
Potentially contaminated stormwater and chemicals (ANE, fuel, NA and ANSol storage areas)	Additional process and storage tanks, loading and receival infrastructure and processes required to support increased ANE production and acceptance of third-party ammonium nitrate solutions (ANSol)	Direct discharge to land causing contamination of soil, groundwater and Cockburn Sound	Fuel and fuel-phased tanks will be located on a sealed surface. Run tank (for process control) will be located within an existing bunded concrete-reinforced hardstand that will be extended by approximately 72 m^2. ANE tanks are stored on raised pads and in accordance with the *Code of Practice (CoP): Storage and handling of UN3375* (AEISG, 2018) (bunding not recommended). Storage tanks (except ANE tanks) have secondary containment – concrete bunding that has minimum 110% capacity of the largest tank. They will also have spillage recovery sumps and pumps and be fitted with level indicators and alarms. The chemical being loaded, tank capacity and volumes will be input in the NA and ANSol loading station control system so that loading will automatically stop when predefined quantity is loaded. Emergency stop button will be installed in the gantry for manual override by the truck driver, who must be the one to initiate and supervise the tanker filling process. ANSol receiving station will include a concrete hardstand sloped to a sump consisting of a pump with an automated flow switch that will transfer liquid spills to the existing neutralisation pit. An isolation valve will be installed to automatically close on completion of transfer.
Fugitive ammonia and process gas emissions under combined purging scenario	Potential failure of containment of the new infrastructure connecting Ammonia Storage Flare (ASF) to Ammonia Plant Flare (APF)	Direct discharge to air	Pipe will be designed to American Society for Testing and Materials (ASTM) A333 (*Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and Other Applications with Required Notch Toughness*) Grade 6, with a new isolation valve installed. Piping will be purged and leak tested with nitrogen after installation.
	Diversion of ammonia storage tank fugitive ammonia emissions from the ASF to APF during biennial maintenance of the ASF - Failure of the connection - Limitation on venting from the ammonia storage tanks vapour space caused by increased		APF has capacity to flare maximum predicted purge volume from ASF and the ammonia plant and back pressures during a combined purging scenario are 7.1 kPa (g) well below the design pressure of 300 kPa (g) for each flare. To prevent back pressure on the ASF system limiting venting from the ammonia storage tanks the following operational controls will apply when the diversion/connection is in use: - Administrative controls to manage the storage tank pressures, including ensuring all refrigeration units are available for service. - No ammonia importing to the ammonia storage tanks during combined purging.

Emission	Sources	Potential pathways	Proposed controls
	backpressure on the ASF system during maintenance		- No additional activities requiring purging to be conducted during maintenance. - There would also be consideration to delay the ammonia plant (AP2) start-up until the ASF was available. Isolation valve on the connection remains closed other than during maintenance of the ASF, is required to be opened manually and there are procedural controls to prevent accidental opening.

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

Human receptors	Distance from prescribed activity
Bottle Shop	~ 0.6 km east of the premises boundary
Cee & See Caravan Park	~ 2.4 km south of the premises boundary
Industrial premises	Immediately adjacent to premises boundary
Medina & Calista residential area	~ 2.25 km east of the premises boundary
East Rockingham, residential area	~ 2.5 km south of the premises boundary
Environmental receptors	**Distance from prescribed activity**
Groundwater	3 m below ground level (mbgl)
Cockburn Sound (State Environmental (Cockburn Sound) Policy 2015)	Immediately adjacent to the premises to the west.
Wetlands: Resource Enhancement & conservation management categories	~ 1.25 km east of the premises boundary
Bushforever site	~ 1.25 km east of the premises boundary
Threatened and Priority Ecological Communities: a) Critically endangered (state category) b) Priority 3 (state category)	a) ~ 1.5 km south of the premises boundary b) ~ 2.25 km east of the premises boundary
Threatened / Priority Flora	~ 1 km east of the premises boundary
Threatened / Priority Fauna: a) Threatened, Endangered b) Priority	a) ~ 0.75 km east of the premises boundary b) Immediately adjacent to premises boundary to the north
Threatened – Vulnerable	~ 0.5 km south of the premises boundary

6.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and take 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 5.

Works approval W6915/2024/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 5 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 5: Risk assessment of potential emissions and discharges from the premises during construction and operation

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Reasoning
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
Construction								
Civil earthworks – vehicle movements, use of equipment / machinery and subsurface construction activities	Spread of existing soil contaminated with nitrogen, arsenic and hydrocarbons	Excavation works causing further spread of contaminated soils, potentially contaminating groundwater and the marine environment	• In situ soils • Groundwater (3 mbgl) • Cockburn Sound	Refer to Section 6.1.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 4: Contaminated site – specified actions	There are two known areas of soil contamination at the premises, with the Arsenic Management Area being within the scope of the proposed works. Excavation works in the area poses an inherent risk to the environment through the migration of soil-borne contaminants. The NAAN2 and NAAN3 infrastructure lies within the Arsenic Management Area. Excavation works for the new chiller units at each plant will be approximately 1.5 m below ground level and about 750 m^3 of soils will be handled during the entire NAAN plant expansion works. Groundwater is not expected to be intersected as it is a further 1.5 mbgl than the excavation works. The primary concern with regards to these works is the subsequent management of the contaminated soils. The applicant has proposed that any excavated soils within the delineated area will be assumed to be contaminated, with testing to be completed to verify risks and disposal of the soils; and controls will be applied in accordance with the Contaminated Sites Auditor endorsed CSMP. The delegated officer considers this appropriate in ensuring an acceptable level of risk of spreading soil contamination is maintained and has included it as a requirement in the works approval. Excavation works at the ANE plant (for storage tank plinths), which is outside of the area delineated as being contaminated, will only be up to 0.5 m depth, and are expected to be confined within the compacted limestone base below the plant. Therefore, the delegated officer is satisfied that the risk of intersecting contaminated soils remains low for these particular works.
	Noise	Air/windborne pathway causing impacts to health and amenity	• Residences 600m - 3 km to the east	Refer to Section 6.1.1	C = Minor L = Rare **Low Risk**	Y	N/A	The delegated officer considers that given the separation to off-site receptors, and the works occurring within a large operating industrial premises, noise associated with construction and installation works is unlikely to be distinguishable from that of the larger premises and impact to off-site human receptors is not reasonably foreseen.
	Dust			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 so no additional regulatory controls are required.
Operation **(including time-limited-operations operations)**								
NAAN plant debottlenecking and tertiary abatement upgrade								
NAAN1, NAAN2 and NAAN3 upgrades to increase production rate (from 3,712,000 to 4,070,800 tpa)	Air emissions (NH_3, N_2O, NOx, CO, CH_4)	Air/windborne pathway causing impacts to health and amenity	• Residences 600m - 3 km to the east	Refer to Section 6.1.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1: Infrastructure and equipment requirements **Conditions 2 and 3: Compliance reporting requirements**	Despite the increase in production as a result of the NAAN plant debottlenecking, it is expected that there will be a decrease in NOx emissions due to the upgrade of the SCR with the addition of a tertiary catalyst reactor (see Table 2). As per section 4.2, a slight increase in CO is predicted but is considered insignificant when compared with the draft Guideline: Air Emissions recommended guideline value, which is based on relevant published Commonwealth criteria. The delegated officer notes that the existing L6107/1967/17 licence authorises emissions from the NAAN plants and includes appropriate controls for this discharge, including continuous monitoring of NOx emissions (A2a), a limit for NOx emissions (A2c) and reporting of monitoring results annually (G2a) and limit exceedances (G3a) which will apply to operation of the NAAN plants once the tertiary catalyst reactor is installed and NAAN plant operation recommences. Environmental commissioning of the tertiary catalyst reactors is not required. The applicant proposes to validate predicted NOx reductions when the new tertiary catalyst reactors are operational via the CEMS NOx monitoring. The delegated officer notes this information will be available to the department in the subsequent annual environmental report submission as a requirement of the licence, or under s.90 of the EP Act this information may be requested by a department inspector if required. As such, the department will be able to verify the predicted levels of abatement. Additional reporting requirements relating to the validation are therefore not required in the works approval.
	Solid waste - spent catalysts (heavy metals)	Direct discharge to land and infiltration causing contamination of soil, groundwater and the marine environment	• Groundwater (3 mbgl) • Cockburn Sound	Refer to Section 6.1.1	C = Minor L = Rare **Low Risk**	Y	N/A	The delegated officer notes that the applicant indicated that the life expectancy for the catalyst is 15 years and that it will be disposed of to a regulated landfill once completed. The applicant should refer to s.53 of the EP Act to determine whether any authorisations will be required in the future when undertaking replacement/disposal of the catalyst.

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Reasoning
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
	Noise	Air/windborne pathway causing impacts to health and amenity	• Residences 600m - 3 km to the east	Refer to Section 6.1.1	C = Minor L = Unlikely **Medium Risk**	Y	Condition 1: Infrastructure and equipment requirements **Conditions 2 and 3: Compliance reporting requirements** Conditions 5-9: Time limited operations	The existing predicted noise levels at the premises are compliant with the night-time LA10 'assigned level' at all residential receptors under 'worst case' climatic propagation conditions. The proposed chiller unit and twin cooling towers present an additional noise source. However, the noise impact assessment concluded that the expansion project is expected to result in a net 1.1 dB decrease in combined NAAN plant noise emissions at the most affected residential receptors (section 5). This predicted reduction in noise emissions is associated with the use of vapour absorption (VAM) technology in the chillers, an upgrade of the tail gas attenuator, variable speed drives on the cooling tower fans and improved lagging of compressor pipework, the latter affecting mainly higher frequency noise emissions. Although the delegated officer found the modelling methodology potentially too simplistic and could therefore not confidently assess the veracity of the proposed noise reductions, it is determined that as long as there is no predicted increase in noise, the risk remains acceptable. Therefore, the aforementioned infrastructure controls are considered necessary to maintain acceptable risk of noise impacting on nearby receptors, and so they have been included as infrastructure requirements in the works approval.
Vapour absorption machine (VAM) and twin cooling towers	Increased hydraulic and nutrient loading of the nutrient stripping wetland system and SDOOL from increased blowdown water (100,000 kL/annum) discharged through the SDOOL,	Discharge to marine environment	• Cockburn Sound	Refer to Section 6.1.1	C = Moderate L = Unlikely **Medium Risk**	Y	Condition 1: Infrastructure and equipment requirements **Conditions 2 and 3: Compliance reporting requirements**	The nutrient-enriched blowdown water from the cooling towers is directed to the nutrient stripping wetland system for treatment before ultimately being discharged to Cockburn Sound through the SDOOL. With the upgrade of the NAAN plants, there will be a predicted increase of 100,000 kL/annum (342 m^3 per day) of wastewater effluent from the increased cooling water blowdown. The SDOOL is operated by Water Corporation (regulated by MS 665) which allows CSBP to discharge up to 3,700 m^3 of wastewater per day. The average daily discharge to the SDOOL over the 2022/23 reporting period was 2,718 m^3. Based on this, the applicant will be able to discharge the predicted increase in wastewater to the SDOOL under the current arrangement with the Water Corporation. The delegated officer notes that the hydraulic capacity of the nutrient stripping wetland system optimally treats 3,000 m^3 per day which is slightly lower than the predicted volume with the increase in blowdown water. However, the delegated officer considers the controls already in place for the management of nutrients in the wetland system (L6107/1967/17, conditions M5 (a) and (b)) are sufficient in maintaining an acceptable level of risk to the environment, and therefore no additional operational controls will be placed on the works approval.
Increased operation hours at the ANE Plant and expansion of NA and ANSol load-out and receival infrastructure								
Increased operation from day-shift only to 24-hours	Noise	Air/windborne pathway causing impacts to health and amenity	• Residences 600m - 3 km to the east	Refer to Section 6.1.1	C = Slight L = Unlikely **Low Risk**	Y	N/A	The ANE plant which involves blending and operation of relatively small pumps is not a major contributor of noise at the premises. The delegated officer has determined that an increase in operation hours will likely be absorbed within the existing noise profile and so no controls are placed in the works approval.
Increased ANE production (from 100,000 to 262,800 tpa) – Loss of containment	Hydrocarbons, ANE and stormwater potentially contaminated with these	Direct discharge to land causing contamination of soil, groundwater and the marine environment	• In situ soils • Groundwater (3 mbgl) • Cockburn Sound	Refer to Section 6.1.1	C = Moderate L = Rare **Medium Risk**	Y	Condition 1: Infrastructure and equipment requirements **Conditions 2 and 3: Compliance reporting requirements**	The ANE plant design capacity is 30 tonnes per hour. The proposed increase in ANE production will be realised by an increase in operation hours only. Therefore, the increase in production does not present any additional point source emissions. To accommodate the increase, there will be a new run tank, three additional ANE storage tanks, a new load-out station, the repurposing of two existing fuel tanks (to fuel-phase tanks), a new fuel-phase run tank and the modification of pumps, pipework, and process control system to integrate the new reagent and product storage tanks. With the addition of new containment infrastructure comes the inherent risk of spills and overtopping impacting on the environment and/or generating contaminated stormwater. To mitigate this risk, the applicant has proposed the following controls: - The new run tank and repurposed fuel-phase tanks will be contained within existing bunded areas that has minimum 110% capacity of the largest tank; - The existing fuel-phase bunded concrete-reinforced hardstand will be extended by approximately 72 m^2 to accommodate the new fuel-phase run tank; and - The additional ANE tanks will be stored on raised pads and in accordance with the *Code of Practice (CoP): Storage and handling of UN3375* (AEISG, 2018). The delegated officer considers these controls necessary in maintaining an acceptable level of risk to the environment and has included them as regulatory controls in the works approval.
Production flexibility (including acceptance of third-party ammonium nitrate solutions (ANSol)) and loading – Loss of containment	NA, ANSol and stormwater potentially contaminated with these			Refer to Section 6.1.1	C = Moderate L = Rare **Medium Risk**	Y	Condition 1: Infrastructure and equipment requirements **Conditions 2 and 3: Compliance reporting requirements**	The applicant proposes to improve efficiency and storage buffering capacity, enabling greater decoupling of nitric acid and ammonia nitrate processes at the premises. To support this, the installation of the following new infrastructure is proposed: - 1,000 t capacity NA storage tank - 700 t capacity ANSol tank; - 1,000 t capacity ANSol receival tank; - 50 t capacity ANSol blending tank; - NA and ANSol loading station; and - ANSol receiving station. With the addition of new containment infrastructure comes the inherent risk of spills and overtopping

Risk events					Risk rating [1] C = consequence L = likelihood	Applicant controls sufficient?	Conditions [2] of works approval	Reasoning
Sources / activities	**Potential emission**	**Potential pathways and impact**	**Receptors**	**Applicant controls**				
								impacting on the environment and/or generating contaminated stormwater. To mitigate this risk, the new storage tanks will be within secondary containment - concrete bunding that has minimum 110% capacity of the largest tank. They will also have spillage recovery sumps and pumps and be fitted with level indicators and alarms. The NA and ANSol loading station and ANSol receiving station will each include a concrete hardstand that slopes to a stainless steel sump that consists of a pump with an automated flow switch to transfer liquids to the existing NAAN neutralisation pit. The NA and ANSol loading station will use a loading arm that has a high-level switch installed and is lowered into the tanker to stop the loading process if the tanker becomes full (as a back-up to a flow integrator). The ANSol receiving station will include an isolation valve that automatically closes on completion of transfer of the ANSol. The delegated officer considers these controls necessary in maintaining an acceptable level of risk to the environment from loss of containment, and has included them as infrastructure controls in the works approval. The NA and ANSol loading station will include a control system which will have the chemical being loaded, tank capacity and volume input via programmable logic controller (PLC) prior to loading. This will allow loading to stop automatically when the predefined volume is reached. An emergency stop button will also be installed in the gantry for manual override by the truck driver who must initiate and supervise the loading process. All NA and AN spills are pumped to the existing NAAN plant neutralisation pit before being pumped to the nutrient stripping wetland system for further treatment, before being discharged to Cockburn Sound through the SDOOL. The discharge of collected wastewater and contaminated stormwater is regulated in licence L6107/1967/17 and so no further operational conditions are required in the works approval.
Ammonia Storage Flare (ASF) connection to Ammonia Plant Flare (APF)								
Ammonia tanks ASF, Ammonia Plant APF and connection to divert fugitive ammonia during biennial maintenance of the ASF.	Ammonia and process gas emissions	Air/windborne pathway causing impacts to health and amenity	• Residences 600m - 3 km to the east	Refer to Section 6.1.1	C = Moderate L =Rare **Medium Risk**	Y	Condition 1: Infrastructure and equipment requirements **<u>Conditions 2 and 3: Compliance reporting requirements</u>** Conditions 5-9: Time limited operations	The proposed diversion of fugitive ammonia from the ASF to the APF for the duration of biennial maintenance activities is proposed to reduce the risk of venting of fugitive ammonia during maintenance events. The diversion pipeline will be constructed to relevant standards, and purged and leak tested prior to use to ensure the integrity of the infrastructure therefore these have been applied as construction controls. Operational controls have also been applied to ensure the diversion is only operated during the intended maintenance scenario. Analysis of the ASF and APF systems indicate they have appropriate design capacity and pressure to enable flaring of purge from both systems. The applicant has proposed additional operational controls to limit venting from the ammonia storage tanks when the diversion is in use as detailed in Table 3. The delegated officer considers the proposed changes will reduce the risk of venting of fugitive ammonia from the ammonia storage tanks during the biennial maintenance events and the proposed controls suitably address the risk of the ammonia or process gas venting occurring associated with the change therefore has applied appropriate operational controls based on these in the works approval.

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. **<u>Bold and underline text</u>** depicts additional regulatory controls imposed by department.

7. Consultation

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

Table 6: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website from 3/05/2024 – 24/05/2024	None received	N/A
The City of Kwinana advised of proposal on 2/05/2024	The City of Kwinana replied on 27/05/2024 with the following comments: • Ensure emergency management plans and capability are considered to mitigate additional risk at the Major Hazard Facility; • It is anticipated that all groundwater quality, contamination controls and emissions will continue to be regulated under the DWER licence; and • Acknowledgment that the applicant has stated a development application will be submitted and therefore, there are no further planning requirements at this time.	CSBP is a Major Hazard Facility as regulated by DEMIRS under the *Dangerous Goods Safety Act 2004.* Therefore, the update of associated emergency management plans and capabilities are not within the scope of this works approval assessment. The delegated officer has considered the likely emissions and discharges of the proposal in this assessment and stipulated controls in the regulatory instrument where appropriate.
Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal on 2/05/2024	DEMIRS replied on 9/05/2024 advising that the manufacturing and storage capacity increases sought in the proposal remain within the status quo of process precursors and finished products at the site. In due course, to adopt the changes as approved by DWER, CSBP will be required to undertake a Dangerous Goods Licence amendment and notification of significant change to their approved Safety Report.	N/A
Kwinana Industries Council (KIC) advised of proposal on 2/05/2024	None received	N/A
Applicant was provided with draft documents on 25/07/2024	• Applicant replied on 19/08/2024 providing the information requested in the draft documents. • Applicant included the intent to construct a new ANSol receiving station and provided the details required in order for it to be adequately assessed. • Applicant advised that a revised development application was lodged to the City of Kwinana on 15/08/2024, and that no concerns were raised at the pre-referral meeting.	• The information provided has been incorporated in the final documents. • ANSol receiving station construction and operation has been considered and included in the decision report and works approval. • The delegated officer understands that a development application for the proposal is being assessed by the City of Kwinana, and that no concerns were raised in the pre-referral meeting.

8. Decisions

Based on the assessment in this report, the delegated officer has determined the proposal does not pose an unacceptable risk of impacts to the environment or public health. Applicant proposed controls were generally found to be reasonable and appropriate to manage the assessed risk of emissions and discharges.

The determination to grant the works approval is based on the following:

Ground excavating works

To mitigate the risk of spreading existing soils contaminated with hydrocarbons, nitrogen and arsenic, the applicant has proposed that any excavated soils will be treated as though they are contaminated (unless laboratory analysis shows they are uncontaminated) by applying the controls within the Contaminated Site Management Plan (CSMP) developed for the premises which has been endorsed by a Contaminated Sites auditor. The delegated officer considered this appropriate and has included is as a condition in the works approval.

NAAN plant debottlenecking works and increased NA and AN production

The proposed increased production capacity of the NAAN plants as a result of debottlenecking works has the potential to increase the risk of air, noise and contaminated water emissions impacting on nearby receptors. The delegated officer has determined that the controls proposed by the applicant are adequate in mitigating much of the risk, and so they have been included as regulatory requirements in the works approval. They include:

- Installation of tertiary catalyst reactors, resulting in a decrease in NOx emissions when compared with current operations;
- Upgrades to existing plant components for noise attenuation (such as tail gas silencers, acoustic insulation, steam injectors, compressor/ expander units; and precooler and air filtration units); and
- Installation of Vapour Absorption Machine (VAM) technology in the chillers to replace the need for noisier air-cooled dump condensers (ACDC).

In addition, conditions in existing licence L6107/1967/17 regarding air emissions and discharges to the marine environment will apply to the NAAN plants once operation recommences. The department will also be able to verify the predicted levels of air emission abatement resulting from the NAAN plant upgrades, as the CEMS monitoring of NOx will be available in the annual environmental report required by the licence, or by request under s.90 of the EP Act.

Increase in ANE production and expansion of NA and ANSol load-out and receival infrastructure

The proposed increase in ANE production will be realised by an increase in operation hours only. Therefore, the increase in production does not present any additional point source emissions. The risk to the environment from this part of the proposal and of the NA and ANSol infrastructure expansion is limited to the loss of containment of increased amounts of hydrocarbons, ANE, NA, ANSol and stormwater potentially contaminated with these. The controls proposed by the applicant are considered necessary in mitigating this risk and so they have been included as regulatory requirements in the works approval. They include:

- All tanks (except ANE tanks) must be installed on concrete-reinforced hardstands with secondary containment bunding that has capacity to hold 110% of the largest tank, and spillage recovery sumps and pumps;
- Containment of ANE will meet applicable standards;
- Tanks will be fitted with level indicators and alarms; and
- ANSol receiving station will be installed with an isolation valve that automatically closes upon completion of transfer, and a sump which pumps spills to the existing neutralisation pit.

Ammonia Storage Flare (ASF) and Ammonia Plant Flare (APF) connection

The delegated officer considers the diversion of fugitive ammonia from the ASF to the APF will reduce the risk of venting from the ammonia storage tanks during the biennial maintenance. The risk associated with this part of the proposal is suitably addressed in the following proposed controls which have been included in the works approval:

- Connection piping is designed to applicable standards and leak tested;
- New isolation valve will be installed and only opened during maintenance of the ASF; and
- Other operational controls limiting importing of ammonia during maintenance and combined venting (of ASF and APF) to avoid risk of back pressure on the ASF system limiting venting from the ammonia storage tanks.

9. Conclusion

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

An amendment to existing licence L6107/1967/17 will be required following the completion of the works to include:

- increased production capacity of categories 31 (chemical manufacturing) and 75 (chemical blending or mixing not causing discharge); and
- diversion of ammonia emissions from the ASF to the APF during maintenance of the ASF.

References

1. American Society for Testing and Materials (ASTM) A333/A333M-18, *Standard Specification for Seamless and Welded Steel Pipe for Low-Temperature Service and Other Applications with Required Notch Toughness, a*s amended from time to time.
2. Australian Explosives Industry and Safety *Group* (AEISG) 2018, *Code of Practice (CoP): Storage and handling of UN3375.*
3. CSBP Limited (CSBP) 2023, *Contaminated Site Management Plan*, Perth, Western Australia.
4. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
5. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
6. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
7. Environmental Protection Authority (EPA) 2005, *Ministerial Statement 689* (MS689) Ammonium Nitrate Production Facility Expansion, Kwinana.
8. Environmental Protection Authority (EPA) 2011, *Ministerial Statement 875* (MS 875) Ammonium Nitrate Production Expansion Project, Kwinana.
9. SLR Consulting Australia (SLR) 2024, *CSBP Kwinana NAAN Debottlenecking Environmental Noise Assessment,* Perth, Western Australia