



Application for Works Approval

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

Works Approval Number W6931/2024/1

Applicant BP Refinery (Kwinana) Pty Ltd

ACN 008 689 763

File number DWER2024/000143

Premises BP Refinery Kwinana
1 Mason Road, Kwinana Beach WA 6167

Legal description
Lot 18 on Deposited Plan 17311
Certificate of Title Volume 2058 Folio 310
As defined by the premises maps attached to the issued works approval

Date of report 5 December 2024

Decision Works approval granted

Alana Kidd
Manager, Green Energy

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 during the H2 Kwinana Renewable Hydrogen Project construction and operation at the premises. As a result of this assessment, works approval W6931/2024/1 has been granted.

2. Scope of assessment

2.1 Regulatory framework

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

2.2 Application summary and overview of premises

On 2 April 2024, BP Refinery (Kwinana) Pty Ltd (the applicant, BP Kwinana), submitted an application for a works approval to the department under section 54 of the *Environmental Protection Act 1986* (EP Act).

The application is to undertake construction works relating to the H2 Kwinana Renewable Hydrogen Project (H2K, H2 Kwinana), a renewable hydrogen production facility located at the BP Kwinana Energy Hub (KEH), 1 Mason Road, Kwinana Beach (the premises, BP Kwinana Refinery). The premises relates to Category 31, chemical manufacturing, and assessed production capacity of 17,520 tonnes (48 tonnes per day) under Schedule 1 of the *Environmental Protection Regulations 1987* (EP Regulations) which are defined in Works Approval W6931/2024/1.

The proposed construction and time limited operations associated with the Works Approval application will occur within the existing prescribed premises (BP Kwinana Refinery) that operates under existing licence L5938/1967/12 for categories 61, 73, 81, and 87 under Schedule 1 of the EP Regulations. The premises is approximately 5 km northwest of Kwinana Town centre and approximately 35 km southwest of Perth CBD.

The H2K facilities will produce hydrogen gas via electrolysis of water. Hydrogen would be stored in a hydrogen storage facility on the premises before being transported to industrial consumers within the Kwinana Industrial Area (KIA) for energy supplementation. 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 W6931/2024/1.

2.3 Construction and operational aspects

2.3.1 Construction

Construction will occur over 21 months. Key infrastructure and equipment to be constructed includes:

- Electrolyser package including;
 - Six electrolyser modules utilising Low Pressure Proton Exchange Membrane (LP MEM);
 - Transformers and rectifiers;
 - H2 and O2 separators; and

- Ultra pure water storage tank.
- Water treatment package with reverse osmosis electro de-ionisation.
- Process effluent pit.
- two five stage reciprocating compressors.
- Purification and drying unit (PDU).
- High pressure hydrogen compression and storage including 14 pressure vessels and 8 tonnes of total storage.
- Emergency diesel generator limited to emergency lighting and uninterruptable power supply backup.
- Hydrogen vent stack.
- Oxygen vent stack.
- Liquid Nitrogen package.
- Cooling Water system and HVAC.
- Ancillary pumps and pipes.
- 33kV and 11kV substations.
- Transformer yard.
- Concrete hardstands and bunding.

Expected emissions from construction include:

- Earthworks and vehicle/machinery movements (dust, noise); and
- Dewatering for building footings if required (groundwater discharge to land).

The construction phase will include mechanical completion checks and hydrotesting with water. Hydrotest water will be disposed of at the existing KEH wastewater treatment plant or at an offsite facility. The applicant's submitted Environmental Management Plan includes controls and mitigations that will be followed during the construction phase. (see Table 4 for further details).

2.3.2 Time limited operations

The commissioning of the facility is expected to take 12 months, where hydrogen will be generated and gradually increased to design rates during the last six months. For a further six months of operating the plant at design rates, the applicant has consequently requested time limited operations for a total of 18 months.

Commissioning will include nitrogen leak testing, introduction of process fluids, starting, operating and optimising the process. During time limited operations the applicant will monitor wastewater streams, conduct a validation noise survey and optimise infrastructure operations to meet performance specification from vendors. As time limited operations occur simultaneously with commissioning activities, the controls and mitigation measures remain the same for both activities as detailed by the H2K Project Environmental Management Plan.

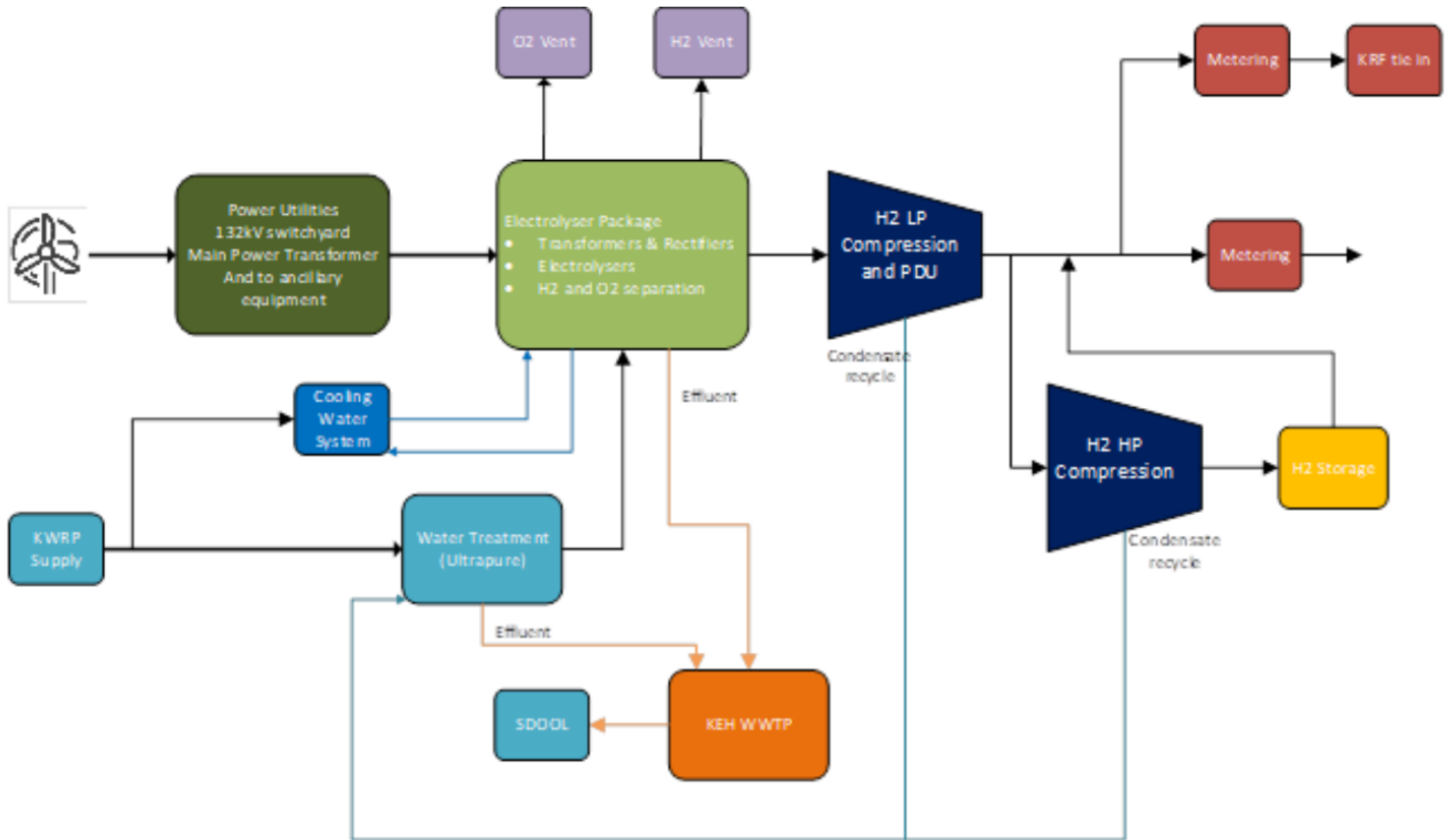


Figure 1: H2K Process flow diagram.

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2.3.3 Operational process

Existing infrastructure will be used for the H2K project including the KEH wastewater treatment plant (WWTP) and Sepia Depression Ocean outlet Landline (SDOOL), 132 kV KEH electrical transmission infrastructure, KEH Nitrogen pipeline, and KEH instrument air. A process flow diagram is depicted in Figure 1.

Expected emissions from the operating facility include:

- Vehicle/machinery movements (dust, noise);
- Facility startup, commissioning and operation (noise);
- Backup generator, vehicle, and machinery diesel combustion (emissions to air);
- Venting of oxygen, hydrogen, and nitrogen (emissions to air);
- Hydrogen compression and purification drying unit (PDU) (noise, wastewater); and
- Ultrapure water treatment (wastewater).

2.3.4 Wastewater

Water is a key requirement for electrolysis. Water will be sourced from the Kwinana Water Reclamation Plant (KWRP) operated by Water Corporation which treats wastewater to provide recycled water for industrial uses. Water would be further filtered via a reverse osmosis electro de-ionisation package on the premises. To facilitate water supply filtration, a new demineralisation water plant will be constructed. The applicant investigated the feasibility for the existing KEH demineralisation facility to be refurbished as an alternate treatment option and determined that the construction of a new demineralisation water plant was the preferred action to facilitate water supply filtration. The existing KEH demineralisation facility will be demolished.

Wastewater streams will be generated during process operation, originating from demineralisation (ultrapure reverse osmosis electro de-ionisation) and knock out drums from compression and maintenance areas. Wastewater is to be sent to the KEH WWTP operated by the applicant, including any contaminated runoff captured in collection pits. Once the wastewater effluent is sent to the KEH WWTP it would be processed and subject to the requirements of existing licence L5938/1967/12. It is noted that the KEH WWTP is already sufficiently bundled to prevent spillages and leaks. The applicant's refining operations which previously sent wastewater to the KEH WWTP are shut down, and the applicant indicates the WWTP has capacity to accept the wastewater requirements from H2 Kwinana. Wastewater quantity and quality from the H2 Kwinana project is specified in Table 1 and key parameters regulated by L5938/1967/12 is below the specified discharge limits prior to treatment.

Processed wastewater is proposed to be sent to the Sepia Depression Ocean Outfall Landline (SDOOL) operated by Water Corporation under Ministerial Statement 665. The applicant currently participates in provision of wastewater from the premises to the SDOOL of up to 3.5 ML/day. The SDOOL monitors physiochemical parameters prior to discharge to the environment including trigger values (Table 1). Wastewater stream from H2 Kwinana (prior to treatment at the KEH WWTP) is within trigger values monitored by the SDOOL.

Table 1: H2 Kwinana effluent stream and WWTP licenced limits

Parameter	Unit	H2 Kwinana Effluent stream	WWTP discharge limits to SDOOL pipeline Licenced under L5938/1967/12	SDOOL management plan operational triggers
Volume	ML/day	0.135	7.93	-
Flow rate	m ³ /hour	5.3	-	N/A ²
Temperature	Celsius	30	-	40 ²
pH	pH	6-8	-	6-9 ²
Conductivity	uS/cm	<1500	-	20,000 ²
Turbidity (max)	NTU	5	-	200 ²
Total dissolved solids (TDS)	mg/ litre	312	-	N/A ¹
Total suspended solids (TSS)	mg/ litre	<37.4	60	N/A ¹
Total chemical oxygen demand	mg/ litre	<80	100	-
Total organic carbon (TOC)	Kg/day	3.1	-	N/A ¹
Nitrates	Kg/day	3.6	200	-
Phosphates	ppm	13.8	-	N/A ¹
Silicates	ppm	12.9	-	N/A ¹

¹ ANZECC/ARMCANZ (2000) guideline trigger values for marine water

² Monitored under SDOOL Monitoring and Management Plan

2.4 Contaminated Sites

The premises is a known contaminated site managed under the *Contaminated Sites Act 2003* (CS Act) and is currently classified as 'contaminated – remediation required'. The premises contamination issues are currently being managed by the department's Contaminated Sites Branch.

The nature and extent of contamination at the site includes hydrocarbons (Light Non-Aqueous Phase Liquid and dissolved phase), metals, and Polyfluoroalkyl (PFAS) substances are present in groundwater. Pesticide and phenol compounds are present as a plume within the underlying groundwater on the site's eastern portion, and arsenic and ammonia are present as a plume within groundwater on the southern portion. Hydrocarbons and metals may be present in soils across the site and PFAS substances may be present in soils associated with the fire training facility.

Due to the site contamination, restrictions exist on the use of soil and groundwater at the premises including:

- Excavation or disturbance is restricted subject to the implementation of a suitable occupational health and safety management plan for all contaminants of concern.
- Site is restricted to industrial use only.
- Other than for analytical testing, remediation and or management of saline intrusion, the abstraction of groundwater from the Safety Bay Sands aquifer requires risk assessment and appropriate management.

Any intrusive works into the soil or groundwater must follow the site's existing procedure for the "Management of soil and groundwater," developed to ensure works are carried out in a manner consistent with the CS Act. The "Management of soil and groundwater" procedure is currently under review by an external auditor and the applicant has stated that it will be provided to the department once approved. The steps to follow for works affecting soil and groundwater are:

- Determine the extent of excavation and if soil and/or groundwater is affected.
- Carry out a contamination assessment of the proposed area to understanding and preventing the distribution of any potential contaminants.
- Consult with BP remediation team and develop a work management plan that includes where and how to dispose of soil and/or groundwater.

A Detailed Site Investigation (DSI) of the premise's contamination is currently being undertaken by the applicant for provision to DWER as part of the applicant's existing requirements under the CS Act.

The delegated officer notes that a construction plan for the management of contamination risks is not currently prepared and will be prepared prior to construction, pending DSI outcomes. Contaminated soil may be treated at the site's waste management area and contaminated soil will be managed by the applicant's "Management of soil and groundwater" procedure. If soil is deemed clean and this is validated, it will be stored in the appropriate location as determined by the "Management of soil and groundwater" procedure prior to reuse on site. If soil is not clean, it will be disposed of to a suitable facility offsite. Further approvals may be required following the DSI outcomes, if the contamination cannot be managed in accordance with the CS Act.

2.5 Noise Modelling

The applicant submitted noise assessment by Acoustic Engineering Solutions (March 2024). The assessment considered noise impacts at sensitive receptors around the premises, comparing them to the levels assigned by the *Environmental Protection (Noise) Regulations 1997* (Noise Regulations). Noise for construction was considered minor and not modelled. Noise sources for construction activities consisted of reversing vehicles and general earth moving equipment operating during daytime hours. Both were considered to be consistent with existing industrial operating noises.

Primary noise sources from the operation of the H2 Kwinana project are: six electrolyser units, reciprocating and storage compressors, water treatment plant, HVAC cooling system, pumps, and transformers.

Two worst case scenarios were modelled, scenario 1 with all equipment including the Kwinana Renewable Fuels proposal and scenario 2 which comprises of scenario 1 plus the existing east flare operating at the normal flow rate.

The applicant's modelling concluded that predicted noise levels for the H2 Kwinana project during worst case meteorological conditions for sensitive receivers have a L_{A10} for nighttime at least 6.4 dB below the assigned noise criteria levels for both scenarios (see Table 2).

Table 2: Predicted worst case noise levels.

Receivers	Nighttime assigned noise levels L_{A10} in dB(A)	Predicted noise levels in dB(A)	
		Scenario 1	Scenario 2
Calista	36	28.0	28.8
Hillman	45	22.0	22.9
Hope Valley	42	33.1	34.9
Leda	35	23.8	24.5
Medina	39	31.9	32.6
North Rockingham	40	31.2	31.7
Wattleup	45	23.7	24.4

Figures 2 and 3 are noise contour maps for worst case noise impacts inside the boundary of the premises and adjoining industrial premises for scenario 2. The worst case 65 dB(A) contour is shown to be within the applicant's premises indicating that they are compliant within the assigned levels at neighbouring industrial premises.

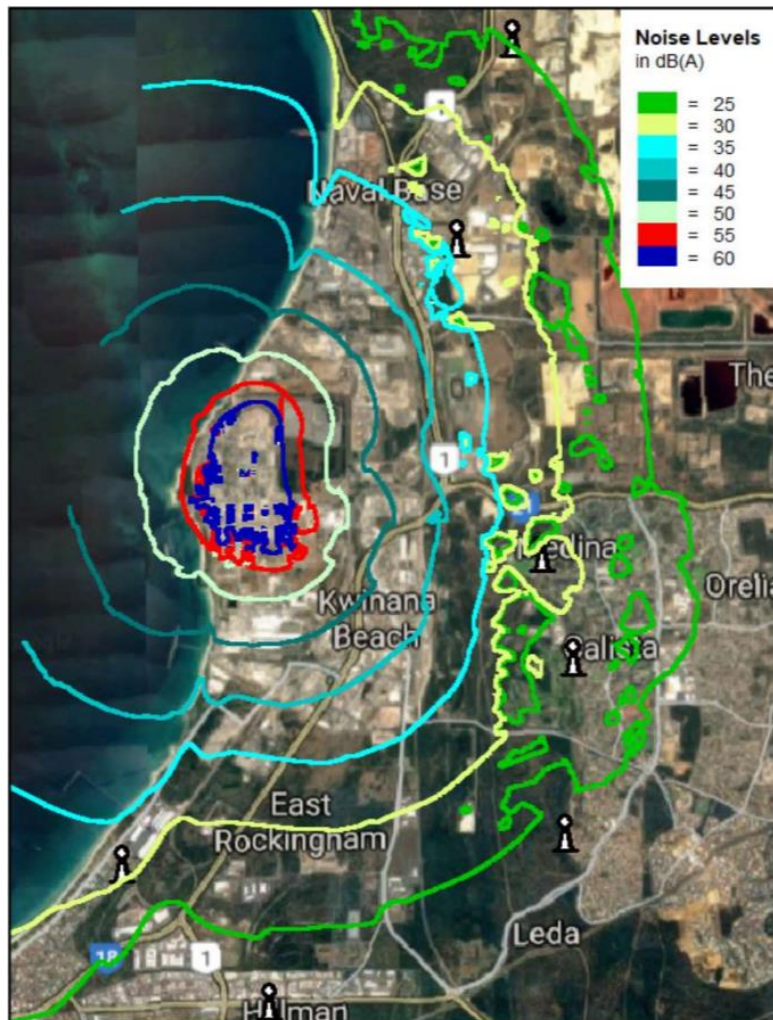


Figure 2: Worst case nighttime noise contour for scenario 2



Figure 3: Zoomed worst case nighttime noise contours for scenario 2

2.5.1 DWER findings

The delegated officer accepted that the operational noise modelling and conclusions were reliable and acceptable. The two modelled operational worst-case scenarios were reasonable and showed the operations should not result in a cumulative increase to noise.

The delegated officer on advice from Environmental Noise Branch's review of noise modelling and conclusions, noted that the noise impact assessment is reliant on the inputs of source sound power levels. Actual noise levels should be monitored and validated during time limited operations with locations within and at the boundary of the premises to verify the noise assessment and compliance with the Noise Regulations.

2.6 Air Quality

The applicant submitted an air quality technical memorandum by Ramboll Australia Pty Ltd providing additional detail and discussion on emissions of hydrogen, oxygen, and nitrogen to air.

Nitrogen, oxygen, and hydrogen are naturally occurring, inert gases in the atmosphere. These gases would be released in low quantities and intermittently for hydrogen and nitrogen as further detailed in Table 3.

Table 2: Emissions to air from H2 Kwinana

Venting stream	venting	Venting height (metres)	Venting temperature (degrees Celsius)	Venting Rate (tonnes / annum)
Hydrogen	Hydrogen will be vented to the atmosphere intermittently via the hydrogen vent. During upset conditions and maintenance events such as shutdowns.	30	60	11
Oxygen	Oxygen is produced from electrolysis and will be vented via the low-pressure oxygen vent continuously during operation.	30	40	144,540
Nitrogen	Nitrogen will be released as a purging gas during commissioning and routine operations.	30	-	2,772

2.6.1 DWER findings

The delegated officer considered the information regarding air quality emissions and advice from the department's Air Quality Branch to determine that:

- The project is not a source of SO₂ emissions and therefore the *Environmental Protection (Kwinana) (Atmospheric Wastes) Policy* is not relevant;
- Oxygen, nitrogen, and hydrogen are naturally occurring elements and are not considered a risk to air pollution in this instance;
- Hydrogen may pose safety issues if ignited and the risk of this hazard will be regulated by the Department of Energy, Mines, Industry Regulation and Safety; and
- Dust is likely to be emitted during the construction phase via earthworks and diesel-powered machinery.

3 Risk assessment

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

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

3.1 Source-pathways and receptors

3.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this decision report are detailed in Table 4 below. Table 4 also details the control measures the applicant has proposed to assist in controlling these emissions, where necessary.

Table 4: Proposed applicant controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Construction machinery, vehicle movements, earthworks etc.	Air / windborne pathway	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> • Area of disturbance to be kept to the minimum practicable. • Location of construction entirely within bp Kwinana Energy Hub, away from community receptors. • Dust suppression via water cart to potential dust sources including unsealed roads, work areas and soil stockpiles. <p>Speed limits as per current site requirements.</p> <p>Materials with potential to emit dust transported via tarped haul trucks.</p> <p>Wind monitoring and control in place if required, to reduce dust emissions.</p> <p>Daily visual dust monitoring.</p> <p>Construction to be limited to occurring during daytime business hours, where possible.</p> <p>Short term of construction period.</p> <p>Complaints register to be maintained and managed throughout construction.</p>
Noise and vibration	Construction machinery, vehicle movements, earthworks, temporary power generation.	Air / windborne pathway	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> • Construction will occur during daytime business hours, where possible. • Maintenance of equipment to avoid unnecessary noise and vibration. • Advise industry neighbors of construction periods and any noise generating activities. • Out of hours work to be carried out in accordance with an approved noise management plan approved by City of Kwinana as per Noise Regulations 1997. <p>Complaints register managed and maintained throughout construction.</p> <p>Located within Kwinana Industrial Area and noise emissions are likely masked by existing operations and industrial neighbors.</p>

Emission	Sources	Potential pathways	Proposed controls
Leachate	Movement and disturbance of contaminated soils,	Seepage to soil and groundwater	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> • Existing BP waste permitting system to track wastes from source and location on and off site. • Screens and ground sheets to prevent spray contamination of soil. • Waste hierarchy will be used for disposal options, exploring reuse recycle options before landfill. • Adherence to the "Management of groundwater and soil" procedure. <p>Site audits and inspections.</p> <p>Monitoring of existing prescribed premises wells for TPH, Benzene, Toluene, Ethyl Benzene and Xylene, total BTEX, Arsenic, Barium, Beryllium, Cadmium, Chromium, Total Chromium (VI), Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Vanadium, Zinc, Total N, N-TKN, N-NO₃ + NO₂, P-PO₄, Total P monitoring of groundwater in accordance with L5938/1967/12.</p> <p>Contaminated soils managed within existing BP Contaminated Soils Procedure to ensure that it is tracked and managed as part per the CS Act requirements.</p>

Emission	Sources	Potential pathways	Proposed controls
Hydrocarbon spills	equipment/machinery leaks, refueling spills	Soil	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> • Maintenance of mobile machinery to ensure hydraulic lines and engine sumps intact and without evidence of leaks. • Construction spill response procedures and spill kits within construction areas • Use of screens and ground sheets to prevent spray contamination. • Mechanical completion activities and punch listing to occur at the end of construction prior to handover to operations to ensure no leaks when water or process fluid is introduced. <p>Vehicle inspection upon arrival at site. Pre-start inspections (daily). Internal site audits and inspections (weekly). Hydrocarbon spill kits must be present and provided as part of emergency response in regard to a spill event. Routine vehicle maintenance.</p>
Gaseous	Diesel combustion of vehicles, machinery and generators.	Air / windborne	Routine vehicle and machinery maintenance.
Dewatering effluent	Dewatering (surficial aquifer).	Discharge to ground	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> • dewatering licence and controls are required for any ground disturbance greater than 2m -4m (approximate depth of the water table) to prevent any groundwater impacts. <p>Contaminated groundwater to be managed and disposed in accordance with BP contaminated soil and groundwater procedures, including:</p> <ul style="list-style-type: none"> • completing a contamination assessment to DWER's regulatory standards of the soil and groundwater that may be mobilized. • prevent distribution of potential contaminants to environmental receptors.

Emission	Sources	Potential pathways	Proposed controls
			<ul style="list-style-type: none"> provide data if waste disposal is required. development of a management plan to DWER regulatory standard. <p>Construction spill response procedures and provision of spill kits within the construction area. Applicant holds current abstraction licence (GWL60605(6)) for the premises under section 5C of the RiWI Act for 486,000 KL for watering and processing purposes. Any dewatering activities may require an approval prior.</p>
Construction waste	Windblown waste from construction activities and equipment packaging. Scrap metal, concrete, pallets.	Windborne, soil	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> Waste segregated appropriately using different waste receptacles and using additional bins if required. Exploring existing reuse and recycle options for waste streams. bp waste permitting system currently in place on site maintains records and regulates waste movements on site. Construction Waste Management plan to be developed by contractors.
Operation			
Noise	Startup, and operation (i.e. compressors, cooling towers, pumps, electrolysers, instrument air, substations), vehicular movements.	Air / windborne pathway	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> Conduct noise measurement survey during TLO. Adherence to Noise Regulations. Operation of units within the optimal operating envelope. Annual review of noise complaints within Part V licence Annual Compliance Audit. <p>Complaints register of premises is active. Noise emitting infrastructure located within an industrial area.</p>
Dust	Vehicular movements.	Air / windborne pathway	<p>Wind monitoring. Daily visual dust inspections. Complaints register managed and maintained</p>

Emission	Sources	Potential pathways	Proposed controls
			throughout construction.
Surface water runoff	Contaminated stormwater and effluent storage, building roofs, hardstands	Seepage to soil and groundwater	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> • Stormwater from clean areas where no chemicals or oils are present will be collected and directed to ground via soakwells. • Potentially contaminated stormwater runoff to collect in pits and tested prior to disposal. Contaminated water to be disposed of via Kwinana Energy Hub Waste Water Treatment Plant (KEH WWTP). <p>Compression and maintenance drains to have knock out drums feeding to the process effluent pit.</p> <p>All process units to have hardstands and bunding.</p> <p>Bunded or hardstand and process areas to drain to oily water sewer for treatment at the WWTP.</p>
Leachate	Contaminated soils.	Seepage to groundwater	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> • Existing BP waste permitting system to track wastes from source and location on and off site. • Screens and ground sheets to prevent spray contamination of soil. • Waste hierarchy will be used for disposal options, exploring reuse recycle options before landfill. • Adherence to the 'Management of groundwater and soil' procedure. <p>Monitoring of existing premises wells for TPH, Benzene, Toluene, Ethyl Benzene and Xylene, total BTEX, Arsenic, Barium, Beryllium, Cadmium, Chromium, Total Chromium (VI), Cobalt, Copper, Lead, Manganese, Mercury, Nickel, Vanadium, Zinc, Total N, N-TKN, N-NO3 + NO2, P-PO4, Total P monitoring of groundwater in accordance with L5938/1967/12</p> <p>Contaminated soils managed within existing BP Contaminated Soils Procedure to ensure that it is tracked and managed as part per the CS Act requirements.</p>

Emission	Sources	Potential pathways	Proposed controls
			Site audits and inspections.
Wastewater discharges	Stormwater runoff storage, RO water system, compression, PDU and maintenance areas.	Sepia depression via SDOOL, and infiltration to ground	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> • Stormwater from clean areas where no chemicals or oils are present will be collected and directed to ground via soakwells. • Potentially contaminated stormwater runoff to collect in pits and tested prior to disposal. Contaminated water to be disposed of via KEH WWTP. • wastewater effluent will be monitored to ensure that its quality is as expected, and be disposed of or treated. • Existing monitoring of the WWTP will remain unchanged. Laboratory analysis of wastewater through the WWTP indicates WWTP health and performance. Final effluent samples are analysed as per the L5938/1967/12 conditions before discharge to SDOOL. <p>WWTP has capacity to take wastewater from H2K (135 kilolitres per day) under existing operational license L5938/1967/12.</p> <p>Monitoring of the WWTP as per L5938/1967/12. Wastewater from the project to be monitored via in-line analyser to ensure compliance with L5938/1967/12 prior to discharges via the SDOOL.</p> <p>Bunded or hardstand process areas to drain to oily water sewer, which is further treated by the WWTP.</p> <p>Drain systems designed to comply with BP requirements.</p>
Chemical and hydrocarbon spills	<p>chemical leaks (biocide, corrosion inhibitor) from cooling tower system and water treatment (hydrogen chloride, sodium chloride, sodium chlorite, citric acid, caustic acid, sodium bisulfate).</p> <p>Compressor and transformer lubricating oil leaks.</p>	Soil and groundwater	<p>Implementation of the Environmental Management Plan controls including:</p> <ul style="list-style-type: none"> • Bunding. • Maintenance procedures and mechanical completions process to ensure no leaks. • Operating procedures to ensure units operate within operating envelope to prevent corrosion and overpressure events. • Business planning and control system with overflow alarms and inventory

Emission	Sources	Potential pathways	Proposed controls
			management. <ul style="list-style-type: none"> • BP emergency response procedures including spill kits. • Visual operator routines. • BP remediation groundwater monitoring program aligning with Part V licence requirements.
Oxygen, nitrogen and hydrogen gas discharges	30m high vents and in event of leaks.	Air / Windborne	Minimise releases of hydrogen where possible. Nitrogen to be used during commissioning, system purging and leak testing. Nitrogen and hydrogen to be vented through 30m high vent. Oxygen to be independently vented through a 30m high oxygen vent.

3.1.2 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 5 and Figure 4 below provides a summary of potential human and environmental receptors that may be impacted because of activities upon or emission and discharges from the prescribed premises (*Guideline: Environmental Siting* (DWER 2020)).

Table 5: Human and environmental receptors and distance from prescribed activity

Receptors	Distance from activity / prescribed premises
Human receptors	
<i>Wells Park</i>	0.9 kilometres south of the premises
<i>Medina Residential Area</i>	2.4 kilometres east of the premises
Environmental receptors	
<p>Underlying groundwater- Safety Bay Sands Aquifer (unconfined) Leederville aquifer (confined) Yarragadee aquifer (confined)</p>	<p>The superficial Safety Bay Sands aquifer overlies two freshwater confined aquifers, the Leederville aquifer and the deeper Yarragadee aquifer at the premises.</p> <p>Groundwater depth of the superficial aquifer across the premises ranges from 0.3 to 2.0 mAHD and varies from 2.5 to 5.0 mBGL. Maximum water table levels are usually observed in August/September, and the lowest level typically recorded in March/April.</p> <p>Groundwater flows generally in a westerly direction to discharge offshore. There are no downgradient users of groundwater due to the premises' coastal siting.</p> <p>The premises is located within the Cockburn Groundwater Area, proclaimed under s.26B(1) of the <i>Rights in Water and Irrigation Act 1914</i> (RiWI Act). Groundwater use in the area is for non-potable purposes and use of the resource is guided by the Cockburn Groundwater Allocation Plan (DWER, 2021).</p>
Surface Water (marine) – Cockburn Sound	Adjacent to the west of premises

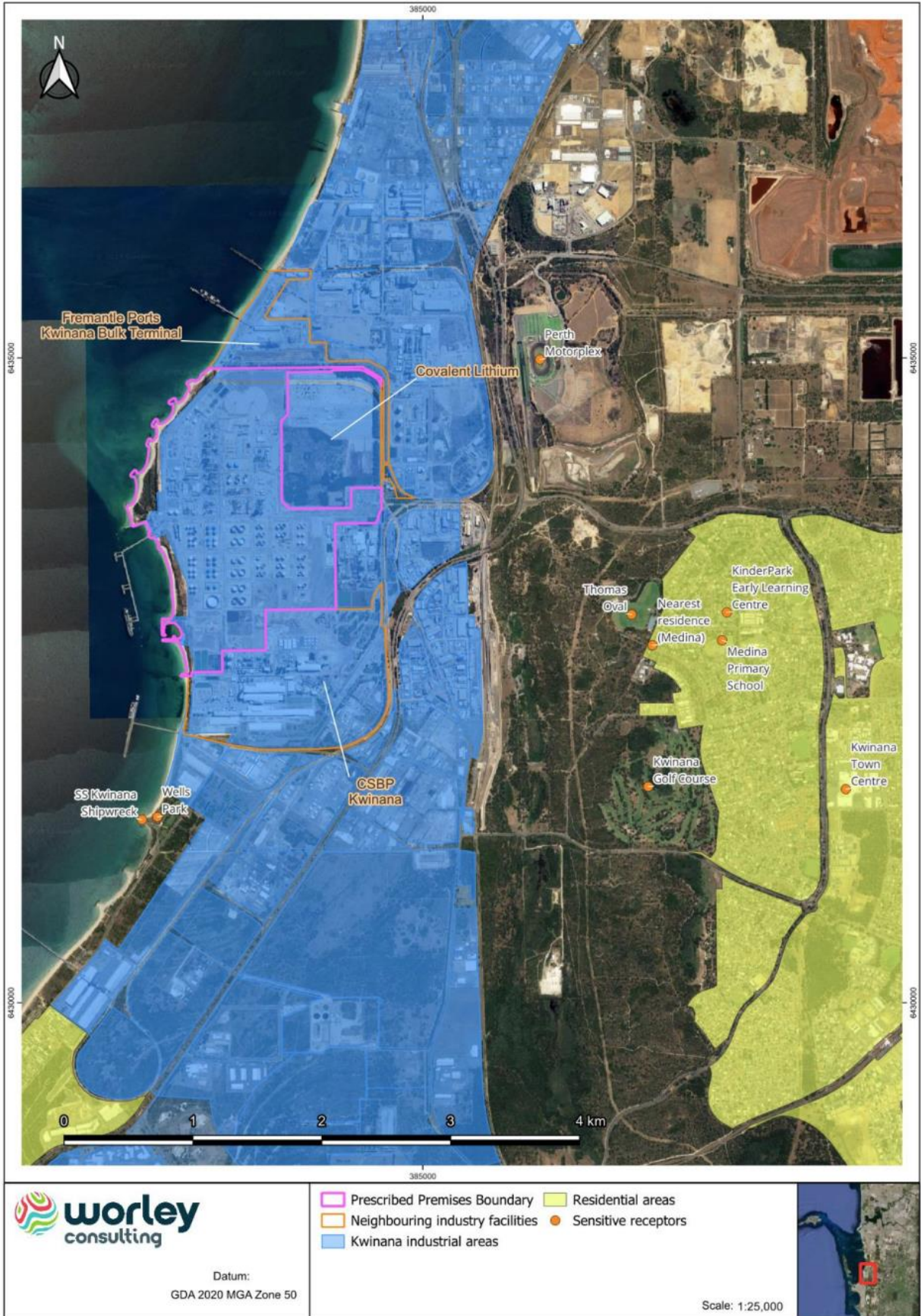


Figure 4: Adjacent land use and nearby sensitive receptors

3.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for each identified emission source and considers potential source-pathway and receptor linkages as identified in Section 2. 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 2), 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 6.

Works approval W6931/2024/1 that accompanies this decision report authorises construction and time-limited operations. The conditions in the issued works approval, as outlined in Table 6 have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence amendment to L5938/1967/12 will be required, following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the premises i.e. chemical manufacturing (hydrogen) activities. A risk assessment for the operational phase has been included in this decision report, however licence conditions will not be finalised until the department assesses compliance with the works approval, and the licence application.

Table 6: Risk assessment of potential emissions and discharges from the premises during construction, commissioning and operation

Risk Event					Risk rating C = consequence L = likelihood	Applicant controls sufficient?	Conditions of works approval	Justification for additional regulatory controls
Source/Activities	Potential emissions	Potential pathways and impact	Receptors	Applicant controls				
Construction								
General construction activities such as earthworks, bulk material storage, vehicle and machinery operation, related fuel storage and construction waste.	Dust	Air/windborne pathway causing impacts to health and amenity	Nearest sensitive receptors: - Wells Park (south) 0.9km - Medina residential area (east) 2.4km	Refer to Section 3 and Table 4. Implementation of the Environmental Management Plan including covered haulage, speed limits, short term construction, complaints register established, daily visual inspection, water cart suppression.	Low level impacts to amenity C = Minor The risk event may only occur in exceptional circumstances L = Rare Low Risk	Y	Conditions 2 and 3	<p>The delegated officer considered the construction activities, duration, geographical context and Noise assessment of the project (outlined in sections 2.2, 2.3 and 2.5).</p> <p>The delegated has determined the risk of construction noise and dust emissions impacting sensitive receptors to be low and medium respectively. To manage the risks, the delegated considers the applicant's proposed controls to be sufficient (see section 3.1, Table 4) and these will be conditioned in the works approval. Key conditions include:</p> <ul style="list-style-type: none"> Fugitive dust controls via water cart, visual monitoring, speed limits, and haulage vehicle coverage; Implementation of the Project Environmental Management Plan H2 Kwinana Energy Hub: <ul style="list-style-type: none"> Construction to occur between 7AM and 7PM excluding Sundays and public holidays, where possible; Out of hours work require an approved noise management plan; Maintenance of equipment; Communication with industry neighbors regarding noise activities; and Maintenance of existing complaints register for the premises. <p>The delegated officer notes that the applicant must comply with the <i>Environmental Protection (Noise) Regulations 1997</i>, regardless of management measures and conditions of the works approval.</p>
	Noise			Refer to Section 3 and Table 4. Implementation of the Environmental Management Plan including established complaints register, works siting within an industrial area, distance from sensitive receptors.	C = minor L = possible Medium Risk	Y	Condition 3.	
	Spills and leaks of hydrocarbons	Overland runoff potentially causing ecosystem disturbance or impacting water quality	Cockburn Sound Safety Bay Sands aquifer	Refer to Section 3 and Table 4 Implementation of the Environmental Management Plan including pre-start inspections (daily), hydrocarbon spill kits kept available in locations of hydrocarbons.	C = Minor L = unlikely Medium Risk	Y	Conditions 1 and 3.	
	Seepage through soil to groundwater impacting soil and groundwater quality							

Risk Event					Risk rating C = consequence L = likelihood	Applicant controls sufficient?	Conditions of works approval	Justification for additional regulatory controls
Source/Activities	Potential emissions	Potential pathways and impact	Receptors	Applicant controls				
Earthworks involving contaminated soils	Contaminated soil and associated leachate (hydrocarbons, metals and PFAS)	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality Seepage through soil to groundwater impacting soil and groundwater quality	Cockburn Sound Safety Bay Sands aquifer	Refer to Section 3 and Table 4 Implementation of the Environmental Management Plan and adherence to the bp Kwinana Contaminated Soil guidelines, which include application of the procedure for the management of soil and groundwater contamination assessment and waste permitting system implementation.	C = Moderate L = Likely High Risk	Y	Conditions 3 and 4.	The delegated officer considered the contaminated sites context of the land and proposed construction activities (outlined in sections 2.3 and 2.4). The delegated officer has determined that the risk of contamination of soil and leachate seeping through soils to groundwater or via overland flow to sensitive receptors to be high. To manage the risk the applicant's controls and obligations under the CS Act are to be implemented to manage the risk (see section 3.1, Table 4) and will be conditioned within the works approval. Key conditions include: <ul style="list-style-type: none"> Implementation of the Kwinana Energy Hub Procedure for the Management of Soil and Groundwater (ENV-PR-075) requiring: <ul style="list-style-type: none"> Completion of a contamination assessment of soils at the development site; Implementation of the Project Environmental Management Plan H2 Kwinana bp Kwinana Energy Hub requiring: <ul style="list-style-type: none"> Waste permitting system implementation; and Provision of the Detailed Site Investigation report to the Department, currently underway.
Dewatering	Groundwater or Contaminated groundwater (hydrocarbons, metals, PFAS, pesticides, phenols, arsenic and ammonia)	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality Seepage through soil to groundwater impacting soil and groundwater quality	Cockburn Sound	Refer to Section 3 and Table 4 Implementation of the Environmental Management Plan controls and BP contaminated soil and groundwater procedures including: contamination assessment, an application of dewatering licence for disturbance of 2m-4m and waste permitting system.	C = Moderate L =Likely High Risk	Y	Conditions 3, 4, and 5.	The delegated officer considered the contaminated sites context of the groundwater and proposed construction activities (outlined in sections 2.3 and 2.4). The delegated officer has determined that the risk of contaminated groundwater emissions to the environment to be high. The applicant's controls and CS Act obligations are to be implemented to manage the risk (see section 3.1, Table 4) and will be conditioned by the works approval. Key conditions include: <ul style="list-style-type: none"> Implementation of the Kwinana Energy Hub Procedure for the Management of Soil and Groundwater (ENV-PR-075) requiring: <ul style="list-style-type: none"> Completion of a contamination assessment of groundwater at the development site; Implementation of the Project Environmental Management Plan H2 Kwinana bp Kwinana Energy Hub requiring: <ul style="list-style-type: none"> Waste permitting system implementation; and Implementation of a construction waste management plan (including contaminated soils). <p>The delegated officer notes that any intended dewatering may require a dewatering license application or amendment for submission to DWER for consideration and approval, which may include further management conditions.</p>
Emissions during time limited operations								
Continual venting from electrolysis system	Air emissions (16.5 tonnes of oxygen per hour/ 144,540 tonnes per annum)	Air/windborne pathway causing impacts to health and amenity	Nearest sensitive receptors: - Wells Park (south) - Medina residential area (east) Nearest industrial receptors (north, east, south)	Refer to Section 3 and Table 4 30m high vent	C = slight L = almost certain Medium Risk	Y	Condition 1, 13, and 14,.	The delegated officer considered vented elements, quantity, frequency and geographical context (outlined in sections 2.3 and 2.6). The delegated officer has determined that the risk of air emissions from operations to be medium. The delegated officer considers the risk of hydrogen ignition to be regulated by the Department of Energy, Mines, Industry Regulation, and Safety as a dangerous good and associated controls and mitigations would be considered as part of any associated licences (see Table 7). The delegated officer considered the applicant controls to be sufficient to mitigate the risk to the environment (see section 3.1, Table 4). The applicant's controls will be conditioned, including: <ul style="list-style-type: none"> Construction vent heights and locations;
Intermittent venting during upset conditions, maintenance events, shutdowns, purging and tank blanketing	Air emissions (2,722 tonnes of nitrogen per year and 11,095 tonnes of hydrogen per			Refer to Section 3 and Table 4 Minimise Events of hydrogen venting, 30m high vent	C = Slight L = almost certain Medium Risk	Y		

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Risk Event					Risk rating C = consequence L = likelihood	Applicant controls sufficient?	Conditions of works approval	Justification for additional regulatory controls
Source/Activities	Potential emissions	Potential pathways and impact	Receptors	Applicant controls				
	year)							<ul style="list-style-type: none"> Emission rates; and Required nitrogen feed to the hydrogen vent.
Process and cooling wastewater	Discharge of treated wastewater (135 kL/day of process effluent and cooling water) via the SDOOL	Direct discharge via the SDOOL impacting marine water quality, leaks and spills from process infrastructure	Sepia Depression	<p>Refer to Section 3 and Table 4</p> <p>Implementation of the Environmental Management Plan controls including: monitoring of waste effluent stream, process areas to be bunded and drain to oily water sewer, effluent to be within existing WWTP licence (L5938/2023/1) parameters.</p>	<p>C = Slight L = Unlikely Low Risk</p>	Y	<p>Conditions 1, 13, 14, 15, 16 and 21.</p>	<p>The delegated officer has considered the operational requirements for wastewater including volumes, and quality of the H2 Kwinana Project and the existing operation of the KEH WWTP (see section 2.3). The delegated officer notes that the KEH WWTP is already bunded.</p> <p>The delegated officer has determined that the risk of additional or greater impacts to the environment from leaks and SDOOL discharges of H2K wastewater; compared to the existing assessed and managed discharge limits, to be low.</p> <p>The delegated officer considers the applicant's proposed controls to be sufficient to manage the risk (see section 3.1, Table 4) if process wastewater is of the volume and quality expected and will condition the applicant's controls including:</p> <ul style="list-style-type: none"> Implementation of the Project Environmental Management Plan H2 Kwinana bp Kwinana Energy Hub; <ul style="list-style-type: none"> Process effluent fed to process effluent pit prior to KEH WWTP; Discharge of wastewater to the KEH WWTP; Process effluent discharge rate; Monitoring of process effluent parameters; and Bunding of process infrastructure. <p><u>To ensure the applicants controls remain sufficient, the delegated officer has conditioned process water volume and parameters that must be met for discharge, in accordance with Table 1.</u></p>
Spills and leaks from the cooling tower system and water treatment plant	Spills and leaks of hydrogen chloride, sodium chlorite, citric acid, caustic soda, sodium bisulfite biocide and corrosion inhibitors	<p>Overland runoff potentially causing ecosystem disturbance or impacting surface water quality</p> <p>Seepage through soil to groundwater impacting soil and groundwater quality</p>	Cockburn Sound Safety Bay Sands aquifer	<p>Refer to Section 3 and Table 4</p> <p>Implementation of the Environmental Management Plan controls including: hardstand and bunding, overfill alarms, mechanical completion procedures, spill kits and emergency response procedures</p>	<p>C = Minor L = unlikely Medium risk</p>	Y	<p>Conditions 1, 6, 13, and 16.</p>	<p>The delegated officer has considered the contaminated sites context, and operational aspects (see sections 2.3 and 2.4).</p> <p>The delegated officer has determined the risk of chemical and hydrocarbon spills and leaks from the project to be medium.</p> <p>The delegated officer considers the applicant's proposed controls and mitigations to be suitable to manage the risk spills and leaks of chemicals and hydrocarbons (see section 3.1, Table 4) and therefore will condition the key controls:</p> <ul style="list-style-type: none"> Implementation of the Project Environmental Management Plan H2 Kwinana bp Kwinana Energy Hub: <ul style="list-style-type: none"> Mechanical completions; Overfill alarms; Spill kits; Operation within design specification; Construction of hardstands and bunding for all chemical and hydrocarbon storage; and Construction of all process infrastructure to be on bunded hardstands. <p><u>The delegated officer considers the permeability of underlying hardstands where chemical storage takes place should be decreased to meet a permeability of 1×10^{-9} or less to further minimise risk of seepage from spills or leaks. Other areas and bunding must have a permeability of 1×10^{-7} or less.</u></p>
Spills and leaks from compressors and transformers	Spills and leaks of hydrocarbons	<p>Overland runoff potentially causing ecosystem disturbance or impacting surface water quality</p> <p>Seepage through soil to groundwater impacting soil and groundwater</p>	Cockburn Sound Safety Bay Sands aquifer	<p>Refer to Section 3 and Table 4</p> <p>Implementation of the Environmental Management Plan controls including: hardstand and bunding, overfill alarms, mechanical completion procedures, spill kits and emergency response procedures</p>	<p>C = Minor L = unlikely Medium risk</p>	Y	<p>Conditions 1, 6, 13, and 16.</p>	<p>The delegated officer has considered the contaminated sites context, and operational aspects (see sections 2.3 and 2.4).</p> <p>The delegated officer has determined the risk of chemical and hydrocarbon spills and leaks from the project to be medium.</p> <p>The delegated officer considers the applicant's proposed controls and mitigations to be suitable to manage the risk spills and leaks of chemicals and hydrocarbons (see section 3.1, Table 4) and therefore will condition the key controls:</p> <ul style="list-style-type: none"> Implementation of the Project Environmental Management Plan H2 Kwinana bp Kwinana Energy Hub: <ul style="list-style-type: none"> Mechanical completions; Overfill alarms; Spill kits; Operation within design specification; Construction of hardstands and bunding for all chemical and hydrocarbon storage; and Construction of all process infrastructure to be on bunded hardstands. <p><u>The delegated officer considers the permeability of underlying hardstands where chemical storage takes place should be decreased to meet a permeability of 1×10^{-9} or less to further minimise risk of seepage from spills or leaks. Other areas and bunding must have a permeability of 1×10^{-7} or less.</u></p>

Risk Event					Risk rating C = consequence L = likelihood	Applicant controls sufficient?	Conditions of works approval	Justification for additional regulatory controls
Source/Activities	Potential emissions	Potential pathways and impact	Receptors	Applicant controls				
		quality						
Stormwater management	Discharge of contaminated or potentially contaminated stormwater	Overland runoff potentially causing ecosystem disturbance or impacting surface water quality Seepage through soil to groundwater impacting soil and groundwater quality	Cockburn Sound Soils Safety Bay Sands aquifer	Refer to Section 3 and Table 4 Implementation of the Environmental Management Plan controls including construction of hardstands and bunding of process areas, clean areas to drain stormwater to soak wells, potentially contaminated areas to drain to pits for testing	C = Minor L = unlikely Medium risk	Y	Condition 1, 15, and 16.	<p>The delegated officer has considered the contaminated sites context, and operational aspects of the project (see sections 2.3 and 2.4), including conditions within the site licence.</p> <p>The delegated offer has determined the risk of stormwater management discharging contaminated waters to the environment as medium.</p> <p>The delegated officer considers that the applicant's proposed controls and mitigations for stormwater management to be reasonable to manage the risk (see section 3.1, Table 4) and therefore will condition the key controls:</p> <ul style="list-style-type: none"> • Implementation of the Project Environmental Management Plan H2 Kwinana bp Kwinana Energy Hub: <ul style="list-style-type: none"> ○ Potentially contaminated stormwater collected and tested prior to disposal ○ Contaminated stormwater sent to KEH WWTP for treatment ○ Stormwater from clean areas to infiltrate to ground via soak wells; and • Construction of hardstands and bunding for all process infrastructure <p>The delegated officer notes that the applicant has not defined the extent of contamination testing, and therefore has conditioned the minimum requirements for testing of potentially contaminated stormwater required to inform appropriate discharge pathways for potentially contaminated stormwater.</p>
Operation of the premises including key noise generating equipment such as compressors, cooling water towers and pumps	Noise	Air/windborne pathway causing impacts to health and amenity	Nearest sensitive receptors: - Wells Park (south) 0.9km - Medina residential area (east) 2.4km Nearest industrial receptors (north, east, south) adjacent	Refer to Section 3 and Table 4 Commission noise monitoring at commissioning, active complaints register, siting in industrial area	C = Moderate L = Rare Medium Risk	Y	Condition 13, 17, 18, 19, 20, and 21.	<p>Noise assessment results indicate compliance with <i>Environmental Noise Regulations 1997</i> under worst case conditions. As the assessment results are highly dependent on the source sound power levels, the delegated Officer considers the noise model should be validated during time limited operations and therefore includes related conditions.</p> <p>The delegated officer considered the operational activities, duration, geographical context and noise assessment of the project (outlined in sections 2.2, 2.3 and 2.5).</p> <p>The delegated officer has determined the risk of operational noise emissions impacting sensitive receptors to be medium. To manage the risks, the delegated officer considers the applicant's proposed controls to be sufficient (see section 3.1, Table 4) and they will be conditioned in the works approval. Key conditions include:</p> <ul style="list-style-type: none"> • Implementation of the Project Environmental Management Plan H2 Kwinana Energy Hub; <ul style="list-style-type: none"> ○ Adherence to Noise Regulations ○ Operation of units within optimal operating range ○ Review of noise complaints • Maintenance of the existing complaints register for the premises; • Noise validation and monitoring to ensure the noise assessment model is accurate • If noise emissions do not comply or indicate non-compliance with the <i>Environmental Protection (Noise) Regulations 1997</i>, prepare an additional noise management plan for the CEO.

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.

4 Consultation

Table 7 provides a summary of the consultation undertaken by the department.

Table 7: Consultation

Consultation method	Comments received	Department response
Application advertised on the department's website on 10 June 2024	<p>Comment period closed 01 July 2024.</p> <p><i>No public comments received.</i></p>	N/A
<p>City of Kwinana advised of proposal on 10 June 2024 regarding Development Approval and on 27 August 2024 regarding Environmental Planning</p>	<p>The City of Kwinana replied on 27 June 2024 confirming that a Development Approval application is currently being assessed. The LGA notes that noise is likely to be compliant with regulations under worst case conditions and air quality is not expected to be significantly affected.</p> <p>The LGA also questions whether there are considerations for emergency response within site and future hydrogen storage.</p> <p>The City advised that coastal hazard and erosion mapping is intended for updating soon and the applicant may be required to prepare a Coastal Adaptation/Hazard Plan to address current and future erosion and inundation risk.</p>	<p>The delegated officer notes the City of Kwinana comments. The Works Approval Application only includes storage infrastructure for 8 tonnes of hydrogen, or approximately 13 pressure vessels. The delegated officer considers emergency response and management for dangerous goods is considered and regulated by the Department of Energy, Mines, Industry Regulation and Safety, the Kwinana Industries Council for emergency management, and Department of Fire and Emergency Services for emergency response planning.</p> <p>The delegated officer notes that the applicant will likely require development of a Coastal Adaptation/Hazard Plan as part of local government approvals.</p>
<p>Department of Energy, Mines, Industry Regulation and Safety (DEMIRS) advised of proposal 10 June 2024</p>	<p>DEMIRS replied on 27 June 2024 advising that the Prescribed Premises Boundary is regulated by DEMIRS under four Dangerous Goods Licences and one major Hazard Facility Safety Report. DEMIRS considers the project facilities described by the Works Approval Application and Kwinana Renewable Fuels Project on the same premises would require a Dangerous Goods licence (or amendment), Dangerous Goods Pipeline Registration(s) and a Major Hazard Facility Safety Report. These required approval applications have not been received by DEMIRS to date and are necessary prior to any dangerous goods being introduced.</p>	<p>On 27 June 2024, DWER advised the applicant if the H2K Works Approval were to be granted, the applicant still needs to seek and acquire Dangerous Goods Approvals prior to the introduction of any dangerous goods and early engagement with DEMIRS is recommended.</p> <p>The delegated officer acknowledges the comments and notes that the applicant has identified DEMIRS as the relevant regulatory authority for hydrogen supply and infrastructure in the application supporting document.</p>
<p>Department of Jobs, Tourism, Science, and Innovation (DJTSI)</p>	<p>DJTSI provided comment on 20 June 2024. Comments were supportive of the development application and</p>	<p>The delegated officer will base a decision on the higher production facility (105 MW) but considers that</p>

<p>advised of proposal 10 June 2024.</p>	<p>advised that the production volume of the project is to be reduced from 105MW to 70MW and a corresponding State Agreement Proposal is being prepared for departmental comment.</p>	<p>respective emissions and therefore impacts are likely to be lower if the project production falls to 70MW during TLO due to a decline in operational requirements.</p>
<p>Department of Planning, Lands and Heritage (DPLH) advised of proposal 10 June 2024.</p>	<p>DPLH provided comment on 26 June 2024 regarding planning and on 01 July 2024 regarding Heritage.</p> <p>Comments advised of the requirement for Development Approval under the <i>Planning and Development Act 2005</i>, and a corresponding application was received by the City of Kwinana in January 2024 which is currently under assessment. DPLH also advised that the applicant has demonstrated awareness of requirements under the <i>Aboriginal Cultural Heritage Act 1972</i> and <i>Native Title Act 1993</i> (Cth). No identified Aboriginal Heritage Places are proposed for disturbance however if future works reveal unknown Aboriginal heritage places, approvals under the <i>Aboriginal Heritage 1971</i> would be required. DPLH noted that bp references their Reconciliation Action Plan and stakeholder engagement with local elders, (Gnaala Karla Booja Aboriginal Corporation and Medina Aboriginal Culture Centre which DPLH encourages to continue.</p>	<p>The delegated officer acknowledges DPLH comments and if new information is discovered about potential Aboriginal heritage places the applicant may need to seek further advice and approval from DPLH and the relevant Aboriginal groups.</p>
<p>Water Corporation advised of proposal on 10 June 2024</p>	<p>No comment was received from Water Corporation.</p>	<p>The delegated officer notes this.</p>
<p>Cockburn Sound Management Council (CSMC) advised of proposal 10 June 2024</p>	<p>CSMC advised on 05 July 2024 that there were no comments to provide on the Works Approval.</p>	<p>The delegated officer notes this.</p>
<p>Kwinana Industries Council (KIC) advised of proposal 10 June 2024</p>	<p>No comment was received from KIC</p>	<p>The delegated officer notes this.</p>
<p>Applicant was provided with draft documents on 11 September 2024</p>	<p>Applicant response on 26 November 2024. Refer to Appendix 1</p>	<p>Refer to Appendix 1</p>

5 Decision

Based on the assessment in this report, the delegated officer has determined that a works approval will be granted. The determination is based on:

- The absence of notable gaseous air pollution.
- The short-term nature of construction and commissioning.
- The project siting on existing disturbed and industrial premises including adjacent land uses and the distance from sensitive residences.
- Existing facility capacity to process wastewater.
- Quality of process wastewater expected.
- Noise assessment indicates noise emissions from the premises will comply with the Noise Regulations during both day and nighttime operations.
- Demonstrated capacity for existing licensed infrastructure to meet wastewater requirements.
- Consideration that risks from Dangerous Goods will be regulated by DEMIRS.
- Management of contaminated sites requirements and commitments.

To further mitigate the potential for environmental, amenity and health impacts the applicant has proposed the following key controls imposed in the works approval as they are considered critical to maintaining an acceptable level of risk:

- Implementation of an Environmental Management Plan.
- Construction of hardstands and bunding for process infrastructure.
- Mechanical completion checks.
- Hydrogen stack nitrogen feed vent.
- Dust suppression/reduction controls.
- Equipment/infrastructure noise limits.
- Hardstand and bunding for chemical and hydrocarbon storage.
- Noise validation testing.
- Wastewater effluent monitoring.
- Stormwater testing for contamination.

The delegated officer has conditioned additional controls that are critical to maintain acceptable levels of risk:

- Construction of hardstands and bunding for all storage infrastructure of chemicals and hydrocarbons.
- Volume and quality of process wastewater.
- Decrease the permeability of underlying constructed hardstands to 1×10^{-9} .
- Chemical storage areas or areas for potential chemical spills are bunded (in addition to having an underlying hardstand permeability of 1×10^{-9}). Bund walls to have a permeability of 1×10^{-7} .
- Minimum required testing for potentially contaminated stormwater.

The delegated officer is satisfied that together, the above controls lower the overall risk profile of the premises. Works Approval W6931/2024/1 that accompanies this report authorises

construction, and time-limited operations only. The conditions in the issued works approval as outlined in the above risk table has been determined in accordance with the *Guidance Statement: Setting Conditions* (DER 2015).

6 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 administration and reporting requirements.

A licence amendment to L5938/1967/12 is required to authorise the ongoing emissions associated with the operation of the premises. A risk assessment for the operational phase has been included in this report, however licence conditions will not be finalised until the department assesses the licence amendment application.

References

1. Acoustic Engineering Solutions 2024, *Noise Assessment of H2K Project*.
2. BMT Oceanica 2014, *Sepia Depression Ocean Outfall Monitoring and Management Plan*.
3. bp Refinery (Kwinana) Pty Lt 2024, *Application for works approval Perth Western Australia*.
4. Bp Refinery (Kwinana) Pty Ltd 2023, *Procedure for the Management of Soil and Groundwater*.
5. Bp Refinery (Kwinana) Pty Ltd 2024, *Project Environmental Management Plan H2 Kwinana*
6. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
7. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
8. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
9. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
10. Worley Services Pty Ltd 2024, *BP H2 Kwinana Renewable Hydrogen Project Works Approval Supporting Document*.
11. Ramboll Australia Pty Ltd 2024, *H2K air emissions technical memo*.

Appendix 1: 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 1 (a)	Administrative error Acronym mistake, works approval incorrectly lists LPMEM instead of LPPEM for “Low Pressure Proton Exchange Membrane”.	Administrative error corrected.
Condition 1, Table 1, Item 1 (c)	In relation to the electrolyser package, request to replace “Must be constructed on a concrete hardstand with a permeability not less than 1x10-9 m/s with a minimum of 300 mm high concrete bunds surrounding the hardstand.” with “Must be constructed on hardstand with roof cover” The reasoning given is that electrolysers modules do not pose a risk to the environment from spills and hence no bunding or permeability thresholds are required.	Given that water would be the primary emission associated with the electrolyser modules themselves, the requirement for hardstand and permeability has been removed. The main areas where a potential spill to ground may occur are the compressor and transformer units which contain lubricating oils and the chemical storage areas for demineralised plant and cooling towers. These are conditioned separately under the works approval.
Condition 1, Table 1 Item 2	Amend “ <i>Cooling water systems</i> ” to state “ <i>Cooling systems.</i> ”	The wording has been amended.
Condition 1, Table 1 Item 2 (a)	Amend “ <i>Must be installed to run one closed loop to cool the consumers of the electrolysis unit and one secondary open loop to cool other infrastructure</i> ” to “ <i>Must be installed to have one open loop cooling system which cools all infrastructure including the closed cooling loop through the electrolysers.</i> ”	The wording has been amended.
Condition 1, Table 1 Item 2 (b)	Amend “ <i>Closed loop system must be designed to hold no more than 93kg of ammonia</i> ” to	The wording has been amended.

Condition	Summary of applicant's comment	Department's response
<p>Condition 1, Table 1 Item 2 (c)</p>	<p><i>"HVAC system must be designed to hold no more than 93 kg of ammonia."</i></p> <p>Amend <i>"Must be constructed on a concrete hardstand with a permeability not less than 1×10^{-9} m/s with a minimum of 300 mm high concrete bunds surrounding the hardstand."</i></p> <p>to</p> <p><i>"Must be constructed on a concrete hardstand;</i></p> <p><i>Chemical tanks and systems associated with the cooling water system will be bunded with permeability between 1×10^{-7} m/s and 1×10^{-9} m/s</i></p> <p><i>Some areas will be roofed (e.g. HVAC) and stormwater will be directed to soakwell."</i></p> <p>The reasoning given is that bunding dimensions are sized based on capacity of volume stored in the bund. Areas that can contain contaminated stormwater or runoff are bunded.</p>	<p>It is noted that bunding dimensions should be sized based on the capacity of volume stored in the bund. In accordance with Water Quality Protection Guidelines No 10 for Above-ground fuel and chemical storage, the condition has been revised.</p> <p>The condition will be revised to specify:</p> <ul style="list-style-type: none"> - - <i>chemical tanks and chemical/hydrocarbon storage must be bunded with a capacity not less than 110% of the capacity of the largest contained tank system and at least 25% of the total capacity of all tanks contained within the bunded area (for a multiple tank system)</i> <ul style="list-style-type: none"> i. - <i>Areas of bulk chemical storage must be built on a hardstand with permeability of 1×10^{-9} or less.</i> - <i>non bulk chemical storage infrastructure built on hardstand area for containment of spillages (floors of hardstand to achieve permeability of 1×10^{-7} to 1×10^{-9} or less)</i> <p>The proponents suggestion for <i>"some areas will be roofed"</i> is ambiguous. Rephrased to</p> <p><i>HVAC areas will be roofed and stormwater directed to soak wells</i></p>
<p>Condition 1, Table 1 Item 4 (d)</p>	<p>Amend <i>"Must be constructed on a concrete hardstand with a permeability not less than 1×10^{-9} m/s with a minimum of 300 mm high concrete bunds surrounding the hardstand"</i></p> <p>to</p> <p><i>"Must be constructed on a concrete hardstand with a permeability not less than 1×10^{-7} m/s."</i></p> <p>The reasoning given is that Australian Standards don't specify a permeability. Bunding dimensions are sized based on capacity of volume stored in the bund. BP practice states that oil and chemical bunds require 1×10^{-7} permeability for bund areas and 1×10^{-9} m/s permeability for under tanks. This is based on industry standards. The equipment does not contain tanks for bulk chemical storage, just a small amount of</p>	<p>It is noted that bunding dimensions should be sized based on the capacity of volume stored in the bund. In accordance with Water Quality Protection Guidelines No 10 for Above-ground fuel and chemical storage, the condition has been revised.</p> <p>Given that bulk chemical storage does not take place in this area (just minimal hydrocarbon storage for equipment lubrication), the condition will be modified.</p> <ul style="list-style-type: none"> - <i>Compressors must be bunded with a capacity not less than 110% of the capacity of the largest contained tank system and at least 25% of the total capacity of all tanks contained within the bunded area (for a multiple tank system)</i>

Condition	Summary of applicant's comment	Department's response
	hydrocarbon storage for lubrication.	- <i>Compressors must be constructed on a hardstand for containment of spillages (floors of hardstand to achieve permeability of 1×10^{-7} to 1×10^{-9} or less)</i>
Condition 1, Table 1 Item 5 (a)	Add wording to allow for disposal to process effluent pit as well as reuse.	The wording has been amended.
Condition 1, Table 1 Item 5 (b)	<p>Amend <i>"Must be constructed on a hardstand of not less than 1×10^{-9} m/s permeability with bunds surrounding hardstand constructed of concrete and a minimum 300mm high"</i></p> <p>to</p> <p><i>"PDU blowers must be constructed on bunded area, stormwater will be collected in the oily water sewer."</i></p> <p>The reasoning given is that Australian Standards don't specify a permeability. Bunding dimensions are sized based on capacity of volume stored in the bund. BP practice states that oil and chemical bunds require 1×10^{-7} permeability for bund areas and 1×10^{-9} m/s permeability for under tanks. This is based on industry standards.</p> <p>The equipment does not contain tanks for bulk chemical storage, just a small amount of hydrocarbon storage for lubrication.</p>	<p>It is noted that bunding dimensions should be sized based on the capacity of volume stored in the bund. In accordance with Water Quality Protection Guidelines No 10 for Above-ground fuel and chemical storage, the condition has been revised.</p> <p>Given that bulk chemical storage does not take place in this area (just minimal hydrocarbon storage for equipment lubrication), the condition will be modified.</p> <p><i>-PDU Blowers must be bunded with a capacity not less than 110% of the capacity of the largest contained tank system and at least 25% of the total capacity of all tanks contained within the bunded area (for a multiple tank system)</i></p> <p><i>- PDU blowers must be constructed on a hardstand for containment of spillages (floors of hardstand to achieve permeability of 1×10^{-7} to 1×10^{-9} or less)</i></p>
Condition 1, Table 1 Item 6	<p>Amend <i>"Fourteen 627kg pressure vessels"</i> to state <i>"up to fourteen pressure vessels."</i></p> <p>The reasoning given is that the condition states the total mass of hydrogen from the proposal and removal from this requirement will avoid confusion.</p>	The wording has been amended.
Condition 1, Table 1 Item 6 (c)	<p>Amend <i>"Must be constructed on a concrete hardstand with a permeability not less than 1×10^{-9} m/s with a minimum of 300 mm high concrete bunds surrounding the hardstand"</i></p> <p>to</p> <p><i>"Compressor area will be bunded with a roof, stormwater will go directly to ground filtration. Bund contents will go to oily water sewer."</i></p> <p>The reasoning given is that this area will be roofed and stormwater runoff will go to soakwells. Bunds within the water treatment unit will go to oily</p>	<p>It is noted that bunding dimensions should be sized based on the capacity of volume stored in the bund. In accordance with Water Quality Protection Guidelines No 10 for Above-ground fuel and chemical storage, the condition has been revised.</p> <p>Given that bulk chemical storage does not take place in this area (just minimal hydrocarbon storage for equipment lubrication), the condition will be modified.</p>

Condition	Summary of applicant's comment	Department's response
	<p>water sewer.</p> <p>The equipment does not contain tanks for bulk chemical storage, just a small amount of hydrocarbon storage for lubrication.</p>	<p>- Compressors must be bunded with a capacity not less than 110% of the capacity of the largest contained tank system and at least 25% of the total capacity of all tanks contained within the bunded area (for a multiple tank system)</p> <p>- Compressors must be constructed on hardstand for containment of spillages (floors of hardstand to achieve permeability of 1×10^{-7} to 1×10^{-9} or less)</p> <p>The condition will also be modified to note that the compressor area must be roofed.</p>
<p>Condition 1, Table 1 Item 7 (a)</p>	<p>Amend "Must be constructed on a concrete hardstand with a permeability not less than 1×10^{-9} m/s with a minimum of 300 mm high concrete bunds surrounding the hardstand. Wastewater must drain to the process effluent pit"</p> <p>to</p> <p>"Must be constructed on hardstand with appropriate bunding for the chemical storage area."</p>	<p>It is noted that bunding dimensions should be sized based on the capacity of volume stored in the bund. In accordance with Water Quality Protection Guidelines No 10 for Above-ground fuel and chemical storage, the condition has been revised.</p> <p>The condition will be revised to specify:</p> <p>- - chemical tanks and chemical/hydrocarbon storage must be bunded with a capacity not less than 110% of the capacity of the largest contained tank system and at least 25% of the total capacity of all tanks contained within the bunded area (for a multiple tank system)</p> <p>i. areas of bulk chemical storage must be built on a hardstand with permeability of 1×10^{-9} or less.</p> <p>- non bulk chemical storage infrastructure built on hardstand area for containment of spillages (floors of hardstand to achieve permeability of 1×10^{-7} to 1×10^{-9} or less)</p>
<p>Condition 1, Table 1 Item 8</p>	<p>Merge into Table 1 (3) to avoid duplication.</p>	<p>The requested amendment has been made.</p>
<p>Condition 1, Table 1 Item 12 (a)</p>	<p>Amend "Must be designed to meet and supply nitrogen requirements of the demineralisation water tank and electrolyser"</p> <p>to</p> <p>"Must be designed to meet and supply nitrogen requirements of the</p>	<p>The wording has been amended.</p>

Condition	Summary of applicant's comment	Department's response
	<p><i>demineralisation water tank and electrolyser and for abnormal operation such as startup, shutdown and maintenance activities as required.</i></p> <p>The reasoning given is that nitrogen is continuously purged to the demineralized water tank, but can also be used to service other parts of the facility as required.</p>	
<p>Condition 1, Table 1 Item 12 (b)</p>	<p>Amend "<i>Must be constructed on a concrete hardstand with a permeability not less than 1×10^{-9} m/s with a minimum of 300 mm high concrete bunds surrounding the hardstand</i>"</p> <p>to</p> <p><i>"Must be constructed on a concrete hardstand."</i></p> <p>The reasoning given is that stormwater runoff will be directed to inground filtration. Liquid Nitrogen package does not pose a risk to the environment from spills and hence no bunding or permeability thresholds are required.</p>	<p>Given liquid nitrogen poses minimal risk of environmental harm, permeability requirements for the concrete hardstand have been removed as requested.</p>
<p>Condition 1, Table 1 Item 13 (a)</p>	<p>Remove requirement as instrument air is being supplied by an existing facility.</p>	<p>This requirement has been removed.</p>
<p>Condition 2, Table 2</p>	<p>Amend "<i>Limiting vehicle speeds to 20 km/h to minimise dust generation</i>"</p> <p>to</p> <p><i>"Limiting vehicle speeds to minimize dust generation."</i></p> <p>The reasoning given is that KEH has a traffic management plan which indicates the allowable speeds on site. Risk assessments of the work activity will dictate whether a further reduction in speed is required.</p>	<p>The wording has been amended to refer to the KEH traffic management plan.</p>
<p>Condition 3 (a)</p>	<p>Suggest removal of this condition as it is required under National Greenhouse Gas Emission Reporting legislation and hence already a requirement and this is duplication.</p>	<p>This has been removed to avoid duplication.</p>
<p>Condition 3 (b)</p>	<p>Amend "<i>Construction equipment, vehicles and machinery must be maintained to manufacturer specification and maintenance schedules recorded in auditable books</i>"</p> <p>to</p>	<p>The condition has been amended to remove "<i>and maintenance schedules recorded in auditable books</i>" and condition 25 has been amended to include a requirement to maintain accurate and audible books for construction equipment under condition 3.</p>

Condition	Summary of applicant's comment	Department's response
	<p><i>"Construction equipment, vehicles and machinery must be maintained."</i></p> <p>The reasoning given is that bp has procedures for the management and maintenance of site equipment.</p>	
Condition 3 (c)	<p>Request removal as a construction waste management plan will be later developed. bp will oversee this process. bp system may not be used depending on the construction contractor and their preferred system. All controlled wastes will be tracked as per the Environmental Protection (Controlled Waste) Regulations 2004.</p>	<p>Condition has been amended to refer to the construction waste management plan, rather than the BP Kwinana waste permitting system.</p>
Condition 3 (f)	<p>Amend <i>"Hydrotesting water must be stored at the water treatment package identified by condition 1 for recycling"</i></p> <p>to</p> <p><i>"Hydrotesting water will be disposed to the existing KEH WWTP or disposed offsite."</i></p>	<p>The wording has been amended.</p>
Condition 4 (a), (b) and (c) Condition 5	<p>Suggest removal or increase to the timeframes outlined in Condition 4 (b) from 14 days to 28 days.</p> <p>The reasoning given is that these actions are regulated under the Contaminated Sites Act and the Contaminated Sites branch and add duplication to reporting requirements. If condition is required, time frame will need to increase to allow reporting time and internal review.</p>	<p>The timeframes outlined in Condition 4 (b) have been amended to 28 days.</p>
Condition 6 (a), (b) and (d)	<p>Remove conditions as bp has a thorough and proven completions process that must be implemented prior to startup which assures the equipment is safe to introduce process fluids. Any incident that causes environmental harm is reported under Section 72 of Environmental Protection Act 1986.</p>	<p>Given existing completion processes/procedures, this condition has been amended to remove 6(a), (b) and (d) as requested.</p>
Condition 6 (c)	<p>Amend <i>"hydrotesting with water of potable quality"</i></p> <p>to</p> <p><i>"hydrotesting with water of appropriate quality."</i></p> <p>The reasoning given is that hydrotest water source will depend on the appropriate quality of the water for that piece of equipment to maintain integrity. Hydrotest water can be groundwater, KWRP or potable water. Where possible the water hierarchy is applied.</p>	<p>The wording has been amended.</p>

Condition	Summary of applicant's comment	Department's response
Condition 12 and 18	<p>Requested modification to time limited operations:</p> <p>Commissioning of the facility is expected to take 12 months, with the last 6 months where hydrogen will be generated and gradually increased to design rates. Propose TLO is for 18 months.</p>	<p>Condition 13 has been added to indicate that once the hydrogen plant achieves operation at the intended capacity, this period of remaining time limited operations will be six months.</p> <p>Condition 18 has also been modified to reflect this alteration in time limited operations so that noise testing takes place once the hydrogen plant is operating at intended capacity during time limited operations.</p>
Condition 13, Table 3 Item 2	<p>Removal of requirement "<i>Hydrotesting water must be recycled by the water treatment package during operation</i>" as per Condition 3 (f) amendment above, Hydrotesting water will be disposed to the existing KEH WWTP or disposed offsite and is independent to this water treatment package</p>	<p>This has been removed.</p>
Condition 13, Table 3 Item 2	<p>Amend "<i>Operational process water must be sourced from the Kwinana Water Reclamation Plant (KWRP) or recycled from hydrotesting activities.</i>"</p> <p>to</p> <p><i>"Operational process water must be sourced from the Kwinana Water Reclamation Plant (KWRP) or potable water supply if KWRP supply is unavailable."</i></p>	<p>The wording has been amended.</p>
Condition 13, Table 3 Item 3	<p>Amend "<i>Closed loop cooling HVAC system must use no more than 93kg of ammonia.</i>"</p> <p>to</p> <p><i>"HVAC system must use no more than 93kg of ammonia."</i></p>	<p>The wording has been amended.</p>
Condition 13, Table 3 Item 3	<p>Amend "<i>wastewater must be routed to the Kwinana Energy Hub Wastewater Treatment Plant operated under licence L5938/1967/12 (and any superseding revision) or be recycled to process water at the Water treatment package identified by condition 1.</i>"</p> <p>to</p> <p><i>"wastewater must be routed to the Kwinana Energy Hub Wastewater Treatment Plant operated under licence L5938/1967/12 (and any superseding revision)."</i></p>	<p>The wording has been amended.</p>

Condition	Summary of applicant's comment	Department's response
Condition 13, Table 3 Item 5	<p>Amend "Nitrogen must only be supplied to the demineralised water tank and electrolyser purging for maintenance."</p> <p>to</p> <p>"Nitrogen must only be supplied to the demineralisation water tank and electrolyser and for abnormal operation such as startup, shutdown and maintenance activities as required."</p>	The wording has been amended.
Condition 13, Table 3 Item 6	<p>Amend "Water and/or condensate must be recycled to process water at the Water Treatment Package identified by condition 1."</p> <p>to</p> <p>"Water and/or condensate must be recycled to process water at the Water Treatment Package identified by condition 1 or disposed of to the process effluent pit."</p> <p>Reasoning given is that the layout enables disposal of water to the process effluent pit if required.</p>	The wording has been amended.
Condition 13, Table 3 Item 6	<p>Amend "Stormwater must be contained, diverted to W2 and tested for contamination prior to release."</p> <p>to</p> <p>"Stormwater must be contained, diverted to oily water sewer and tested for contamination prior to release."</p> <p>Reasoning given is that reference to W2 is not consistent with the rest of the document.</p>	The wording has been amended.
Condition 13, Table 3 Item 8	<p>Amend "Fourteen 627kg pressure vessels" to state "up to fourteen pressure vessels."</p> <p>The reasoning given is that the condition states the total mass of hydrogen from the proposal and removal from this requirement will avoid confusion.</p>	The wording has been amended.
Condition 13, Table 3 Item 11	<p>Amend "Water and/or condensate must be recycled to process water at the Water Treatment Package identified by condition 1."</p> <p>to</p> <p>"Water and/or condensate must be recycled to process water at the</p>	The wording has been amended.

Condition	Summary of applicant's comment	Department's response
	<p><i>Water Treatment Package or disposed of to existing KEH WWTP identified by condition 1.</i></p> <p>Reasoning given is condensate can also be diverted to the process effluent pit if required (abnormal operation).</p>	
<p>Condition 13, Table 3 Item 11</p>	<p>Applicant suggests removal of <i>"Stormwater must be contained, diverted to W2 as identified on Figure 2, Schedule 1; and tested for contamination prior to release"</i></p> <p>Reasoning given is that purification drying unit does not pose a risk to the environment from spills. All runoff will be directed to soakwell for inground filtration.</p>	<p>This has been removed.</p> <p>Given that this infrastructure does not pose a risk to the environment from spills, the department determine that removing this condition would not increase risks to the environment.</p>
<p>Condition 13, Table 3 Item 12</p>	<p>Applicant suggests removal as instrument air is being supplied by existing KEH facilities as per 2.2.8 of WAA.</p>	<p>This condition has not been removed as it relates to operational requirements not currently included in the existing licence.</p>
<p>Condition 13, Table 3 Item 15</p>	<p>Amend <i>"Stormwater from transformers and safety showers must be contained, diverted to W2 as identified on Figure 2, Schedule 1; and tested for contamination prior to release."</i></p> <p>to</p> <p><i>"Stormwater from transformers and safety showers must be contained, diverted to Oily water sewer as identified on Figure 2, Schedule 1; and tested for contamination prior to release."</i></p> <p>Reasoning given is that reference to W2 is not consistent with the rest of the document.</p>	<p>The wording has been amended.</p>
<p>Condition 13, Table 3 Item 16</p>	<p>Applicant suggests removal of <i>"Infrastructure operated and consuming electricity supplied via the South West Interconnected System (SWIS) must equate to 100% renewably generated electricity inclusive of surrendered Large-scale Generation Certificates (LGC)."</i></p> <p>Given this project is a green energy project, BP H2 Kwinana will report green power usage to:</p> <ul style="list-style-type: none"> • ARENA as part of the Hydrogen Headstart funding • Renewable Energy Target Scheme under Department of Climate Change, Energy, the Environment and Water: LGCs will be registered and surrendered to the Clean Energy regulator (through the Renewable Certificate Registry) 	<p>Given reporting of the project's green energy requirements occurs under other mechanisms, this requirement has been removed from the works approval.</p>

Condition	Summary of applicant's comment	Department's response
	<ul style="list-style-type: none"> • Customer contracts – Contracts will be to supply green hydrogen and hence will require evidence to show it is green • National Greenhouse and Energy Reporting Scheme (NGERS) – Scope 2 emissions will be reported as zero as BP will be surrendering 1LGC for each MW of electricity consumed. • In the future – Guarantee of Origin scheme framework under Clean Energy regulator (still in development), a certified way to demonstrate that BP are producing green hydrogen based on lifecycle carbon intensity 	
Condition 13, Table 3 Item 16	<p>Amend "<i>Must operate at <85dB.</i>"</p> <p>to</p> <p><i>"Must conform with Environmental Protection (Noise) Regulations 1997."</i></p>	The wording has been amended.
Condition 13, Table 3 Item 16	<p>Amend "<i>All process effluent generated by infrastructure must be collected by W1 as identified on Figure 2, Schedule 1.</i>"</p> <p>to</p> <p><i>"All process effluent generated by infrastructure must be collected by process effluent pit as identified on Figure 2, Schedule 1."</i></p> <p>Reasoning given is that reference to W2 is not consistent with the rest of the document.</p>	The wording has been amended.
Condition 14, Table 4 Item 4	<p>Amend "<i>Oily Water Sewer Contaminated Stormwater and/or contaminated runoff originating from low pressure hydrogen compression, PDU, main transformer areas and safety shower.</i>"</p> <p>to</p> <p><i>"Contaminated Stormwater and/or contaminated runoff originating from chemical storage areas, compressor areas, main transformer areas and safety showers."</i></p>	The wording has been amended.
Condition 15	Requested condition removed as throughout time limited operations, site effluent will be tested and monitored under Prescribed Premise licence L5938/1967/12.	<p>The condition is required to ensure that effluent from the infrastructure approved to operate during time limited operations under this works approval is monitored.</p> <p>The wording has been amended for clarity.</p>
Condition 16 (a)	Amend the typo " <i>AS/AZS5667.10</i> " to " <i>AS/NZS5667.10</i> ."	The typo has been amended.

Condition	Summary of applicant's comment	Department's response
Condition 16 (b)	<p>Amend "Stormwater and runoff sampled by condition 16(a) must be tested by NATA accredited laboratory prior to disposal."</p> <p>to</p> <p>"Clean or expected clean stormwater and runoff sampled by condition 16(a) will be tested for expected contaminants prior to disposal to ground infiltration."</p> <p>Reasoning given is that analysis by NATA accreditation takes additional time that might not be available depending on rain events increasing the risk of overflow incidents. Effluent may not be tested if it is known to be contaminated and disposed directly to KEH WWTP.</p>	<p>This condition has been amended to allow for all stormwater and runoff to be treated at the KEH WWTP, including if testing at a NATA accredited laboratory has not occurred, to reduce the risk of overflow incidents in the event of heavy rainfall.</p> <p>Where the applicant wishes to discharge or dispose of stormwater and runoff to the ground via soak wells, samples must be tested by a NATA accredited laboratory prior to disposal and parameters must be within specified values in Table 6.</p>
Condition 16 (c)	<p>Amend "Testing required by 16(b) must include parameters identified by table 5 in addition to: gross contamination, surfactants, polycyclic aromatic hydrocarbons, and metals."</p> <p>to</p> <p>"Testing required by 16(b) must include parameters pH, total petroleum hydrocarbons, COD, BOD."</p> <p>Reasoning given is that Table 5 indicates the process effluent parameters and would not be reflective of contaminated runoff.</p>	<p>This condition has not been changed at this stage. Monitoring during time limited operations may include a larger suite of analytes to ensure that the composition of stormwater and runoff at the premises is fully understood. The testing suite can be reviewed at the licence amendment stage.</p>
Condition 16 (f)	<p>Applicant suggests removal as these parameters were indicating composition of the effluent and not limits that are problematic. The site effluent will be tested and monitored under L5938/1967/12. Offspec effluent can be diverted to KEH WWTP for further treatment if required, ensuring that our effluent to SDOOL remains on spec. This is the current operating practice of the WWTP.</p>	<p>This condition has not been changed. Given the new effluent stream, additional monitoring is required to ensure that the effluent produced under time limited operations under this works approval is an appropriate quality.</p> <p>Parameters may be reviewed at the licence amendment stage.</p>
Condition 16 (g)	<p>Applicant suggests removal as the current operating practice at the KEH WWTP diverts offspec effluent to the front end of KEH WWTP for further treatment if required, ensuring that our effluent to SDOOL remains on spec.</p>	<p>This condition has not been changed. Given the new effluent stream, this condition is required to ensure that the effluent produced under time limited operations under this works approval is treated to an appropriate quality.</p> <p>Parameters may be reviewed at the licence amendment stage.</p>
Condition 16 (h)	<p>Amend "Spill kits must be present and maintained at all infrastructure identified by condition 1 that contains or may contain process fluids."</p>	<p>This condition has not been changed. Keeping spill kits in the location of infrastructure where spills may occur is a standard condition.</p>

Condition	Summary of applicant's comment	Department's response
	<p>to</p> <p><i>"Spill kits must be present and provided by emergency response in response to a spill event."</i></p> <p>Reasoning given is that spill kits are employed to certain jobs if required or by emergency response in response to an incident.</p>	
<p>Condition 23 (e), (f) and (g)</p>	<p>Applicant suggests removal as this condition relates to greenhouse gas emissions which are regulated under Commonwealth legislation.</p> <p>Given this project is a green energy project, BP H2 Kwinana will report green power usage to:</p> <ul style="list-style-type: none"> • ARENA as part of the Hydrogen Headstart funding • Renewable Energy Target Scheme under Department of Climate Change, Energy, the Environment and Water: LGCs will be registered and surrendered to the Clean Energy regulator (through the Renewable Certificate Registry) • Customer contracts – Contracts will be to supply green hydrogen and hence will require evidence to show it is green • National Greenhouse and Energy Reporting Scheme (NGERS) – Scope 2 emissions will be reported as zero as BP will be surrendering 1LGC for each MW of electricity consumed. • In the future – Guarantee of Origin scheme framework under Clean Energy regulator (still in development), a certified way to demonstrate that BP are producing green hydrogen based on lifecycle carbon intensity 	<p>Given reporting of the project's green energy requirements occurs under other mechanisms, this requirement has been removed from the works approval.</p>
<p>Condition 25</p>	<p>Condition refers to incurred condition number.</p>	<p>Typo has been amended.</p>

Appendix 2: Application validation summary

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)				
Application type				
Works approval	<input checked="" type="checkbox"/>			
Licence	<input type="checkbox"/>	Relevant works approval number:		None <input type="checkbox"/>
		Has the works approval been complied with?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Has time limited operations under the works approval demonstrated acceptable operations?	Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/>	
		Environmental Compliance Report / Critical Containment Infrastructure Report submitted?	Yes <input type="checkbox"/> No <input type="checkbox"/>	
		Date report received:		
Renewal	<input type="checkbox"/>	Current licence number:		
Amendment to works approval	<input type="checkbox"/>	Current works approval number:		
Amendment to licence	<input type="checkbox"/>	Current licence number:		
		Relevant works approval number:		N/A <input type="checkbox"/>
Registration	<input type="checkbox"/>	Current works approval number:		None <input type="checkbox"/>
Date application received	02 April 2024			
Applicant and premises details				
Applicant name/s (full legal name/s)	Bp Refinery (Kwinana) Pty Ltd			
Premises name	Bp Kwinana Energy Hub			
Premises location	Lot 18 on Plan 17311 1 Mason Road Kwinana Beach WA			
Local Government Authority	City of Kwinana			
Application documents				
HPCM file reference number:	DER2024/000143~1			
Key application documents (additional to application form):	Supporting document - A2268695 Attachments package - A2268696 - Proof of occupancy - ASIC extract - Figures - Project EMP - Noise Assessment - Aboriginal Heritage enquiry search results			
Scope of application/assessment				

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)

<p>Summary of proposed activities or changes to existing operations.</p>	<p><u>Works approval</u></p> <p><i>Construction of a renewable hydrogen production facility located on the site of bp's former Kwinana oil refinery within the Kwinana Industrial Area, now referred to as the bp Kwinana Energy Hub (KEH). The site is an existing prescribed premises operating under Licence L5938/1967/12.</i></p> <p><i>Hydrogen will be produced via electrolysis of water, with 100% of operational electricity sourced from renewables. Produced hydrogen is planned to be used by bp in the proposed Kwinana Renewable Fuels biorefinery being considered at the KEH site, and by other industrial operations in the Kwinana area.</i></p> <p><i>The renewable hydrogen facility will be capable of producing up to 48 tonnes per day of hydrogen and will include an 8 tonne storage facility. The facility will utilise an existing WWTP and other utilities on the premises, requiring construction/installation of the following infrastructure and equipment:</i></p> <ul style="list-style-type: none"> <i>• Electrolyser package comprised of six electrolyser modules with low pressure proton exchange membranes, a 30 m high low pressure oxygen vent and a 30 m high hydrogen vent;</i> <i>• Water treatment plant comprised of an ultra-filtration package, reverse osmosis package, electro de-ionisation package and demineralised water storage tank;</i> <i>• Low pressure hydrogen compression unit comprised of three, five-stage reciprocating compressors, knock out vessels and coolers;</i> <i>• Purification and drying unit (PDU) comprised of a H2 purification reactor, cooling and H2 dryer absorbers;</i> <i>• High pressure hydrogen compression and hydrogen storage comprising 13 pressure vessels;</i> <i>• A cooling system with a closed loop that cools the electrolysis package and a secondary open loop for cooling the hydrogen compressors and PDU. The system is comprised of cooling towers, recirculation pumps, individual cooling medium supply and return pipelines;</i> <i>• HVAC system expected to use ammonia as the cooling medium;</i> <i>• Liquid nitrogen package to supply nitrogen to the demineralised water tank and electrolyser when purging for maintenance; and</i> <i>• An emergency diesel generator.</i> <p><i>The application includes environmental commissioning and 180 days of time limited operations.</i></p> <p><i>Following completion of the works, the applicant intends to submit an application to amend existing premises licence L5938/1967/12 to authorise emissions and discharges during ongoing operations.</i></p>
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SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)

Category number/s (activities that cause the premises to become prescribed premises)

Table 1: Prescribed premises categories

Prescribed premises category and description	Proposed production or design capacity	Proposed changes to the production or design capacity (amendments only)
Category 31 - <i>Chemical manufacturing: premises (other than premises with category 32) on which chemical products are manufactured by a chemical process)</i>	17,520 tonnes per year	N/A

Legislative context and other approvals

Has the applicant referred, or do they intend to refer, their proposal to the EPA under Part IV of the EP Act as a significant proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Referral decision No: Managed under Part V <input type="checkbox"/> Assessed under Part IV <input type="checkbox"/>
Does the applicant hold any existing Part IV Ministerial Statements relevant to the application?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Ministerial statement No: EPA Report No:
Has the proposal been referred and/or assessed under the EPBC Act?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Reference No:
Has the applicant demonstrated occupancy (proof of occupier status)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Certificate of title <input checked="" type="checkbox"/> General lease <input type="checkbox"/> Expiry: Mining lease / tenement <input type="checkbox"/> Expiry: Other evidence <input type="checkbox"/> Expiry:
Has the applicant obtained all relevant planning approvals?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/> N/A <input type="checkbox"/>	Approval: Expiry date: If N/A explain why? The applicant is currently preparing a Development Application for submission to the City of Kwinana under Planning Scheme No. 2 and the Metropolitan Region Scheme.
Has the applicant applied for, or have an existing EP Act clearing permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	CPS No: N/A No clearing is proposed.
Has the applicant applied for, or have an existing CAWS Act clearing licence in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Application reference No: N/A Licence/permit No: N/A No clearing is proposed.

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)		
Has the applicant applied for, or have an existing RIWI Act licence or permit in relation to this proposal?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Applicant may potentially require a licence for dewatering to construct the works. Application reference No: Licence/permit No: Licence / permit not required.
Does the proposal involve a discharge of waste into a designated area (as defined in section 57 of the EP Act)?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	Name: Cockburn Groundwater Area Type: Proclaimed Groundwater Area Has Regulatory Services (Water) been consulted? Yes <input checked="" type="checkbox"/> No <input type="checkbox"/> N/A <input type="checkbox"/> Regional office: Kwinana Peel
Is the Premises situated in a Public Drinking Water Source Area (PDWSA)?	Yes <input type="checkbox"/> No <input checked="" type="checkbox"/>	Name: N/A Priority: N/A Are the proposed activities/ landuse compatible with the PDWSA (refer to WQPN 25)? Yes <input type="checkbox"/> No <input type="checkbox"/> N/A <input checked="" type="checkbox"/>
Is the Premises subject to any other Acts or subsidiary regulations (e.g. <i>Dangerous Goods Safety Act 2004, Environmental Protection (Controlled Waste) Regulations 2004, State Agreement Act xxxx</i>)	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	<i>Environmental Protection (Kwinana) Atmospheric Wastes) Regulations 1992</i> <i>Dangerous Goods Safety Act 2004</i> <i>Oil Refinery (Kwinana) Agreement 1952</i>
Is the Premises within an Environmental Protection Policy (EPP) Area?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	State Environmental (Cockburn Sound) Policy Environmental Protection (Kwinana) (Atmospheric Wastes) Policy
Is the Premises subject to any EPP requirements?	Yes <input checked="" type="checkbox"/> No <input type="checkbox"/>	SO ₂ and TSP requirements of Kwinana EPP

SECTION 1: APPLICATION SUMMARY (as updated from validation checklist)

<p>Is the Premises a known or suspected contaminated site under the <i>Contaminated Sites Act 2003</i>?</p>	<p>Yes <input checked="" type="checkbox"/> No <input type="checkbox"/></p>	<p>Classification: contaminated – remediation required (C–RR)</p> <p>Date of classification: 5 December 2019</p> <p>Hydrocarbons (such as from petrol, diesel or oil), metals and PFAS substances are present in groundwater beneath the site. Pesticide and phenol compounds are present as a plume in groundwater on the eastern portion of the site. Arsenic and ammonia are present as a plume in groundwater on the southern portion of the site.</p> <p>Hydrocarbons and metals may also be present in soils across the site and PFAS substances within soils associated with the fire training facility. The extent of any impacts in soil is unknown.</p> <p>Other than for analytical testing, remediation of contamination and/or management of saline intrusion, groundwater abstraction from the Safety Bay Sands aquifer is not permitted at this site because of the nature and extent of groundwater contamination.</p> <p>Excavation or disturbance of soils is restricted subject to the implementation of a suitable occupational health and safety management plan for all identified and potential contaminants of concern.</p>
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