Application for Works Approval Amendment

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

Works Approval Number	W6882/2024/1
Works Approval Holder	BHP Nickel West Pty Ltd
ACN	004 184 598
EO reference Number	APP-0031706 INS-0002720
Premises	1. Kwinana Nickel Refinery Lot 89 on Deposited Plan 411084 Patterson Road, Kwinana Beach WA 6167 Certificate of Title Volume 2958 Folio 292 2. Baldivis Facility Lot 820 on Plan 77252 Miller Road, Baldivis WA 6171 Certificate of Title Volume 2841 Folio 582
Date of Report	28/01/2026
Decision	Revised works approval granted

1. Decision summary

Works Approval W6682/2024/1 (W6682) is held by BHP Nickel West Pty Ltd (the Works Approval Holder) for the Kwinana Nickel Refinery and the Baldivis Facility (the Premises), located at Lot 89 Patterson Road, Kwinana Beach and Lot 820 Miller Road, Baldivis respectively.

This Amendment Report documents the assessment of potential risks to the environment and public health from proposed changes to the emissions and discharges during the construction and operation of the Premises. As a result of this assessment, an amended Works Approval W6682/2024/1 has been granted.

This amendment is made pursuant to section 59 of the *Environmental Protection Act 1986* (EP Act) to amend the works approval issued under the EP Act for prescribed premises as set out below.

2. Scope of assessment

2.1 Regulatory framework

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

2.2 Background

The Kwinana Nickel Refinery premises is separated into two main operational areas the Kwinana Nickel Refinery which is the primary prescribed category activities area, and the Baldivis Facility, a parcel of land which is 5.5km south-east of the Kwinana Nickel Refinery portion of the premises and contains a closed ammonia sulphate residue tailings storage facility (TSF), and three wastewater Evaporation Cells (EC), a staging pond tanks and a pumping station to support the return flow back to the refinery.

These two areas are joined by a utilities corridor where wastewater is conveyed between the refinery to the ECs; and contains necessary associated L8437/2010/3 (Date of Amendment 27/10/2025) infrastructure such as pumps and electrical line that support the conveyance of wastewater.

Wastewater is generated at the Kwinana Nickel Refinery as a biproduct of the nickel refining processes including leaching of nickel matte, copper boiling, nickel reduction, cobalt recovery, ammonium sulphate recovery and from the wastewater treatment plant that recycles water back into process operations at the refinery. Surplus effluents are volumetrically reduced through evaporation at the Baldivis Facility.

The process effluent going into the ECs has extremely high total dissolved solids, which includes very high levels of ammonium sulphate, a range of metals including high levels of nickel, heavy metals such as copper and cobalt; and metalloids such as boron and silica. At very high concentrations ammonia sulphate can kill vegetation, acidify soils and mobilise soluble aluminium, reducing the availability of cations in the soil which can impact on the chemical and physical structure and function of soil. The metals and metalloid compounds in the effluent such as nickel, cobalt and copper and known to be toxic to aquatic freshwater and marine biota.

In July 2024 the works approval holder announced that from October 2024 the operations at the premises will be temporarily suspended. During the temporary suspension the works approval holder's mining and processing operations will be suspended, including processing operations at the premises. Handover activities relating to processing and effluent management at the premises was complete at the end of March 2025.

Following the completion of the ponds relining project, liquor held in the Chlorine Brine Storage Tanks at the refinery (liquor transferred to allow the relining of EC1), may be transferred back to the relevant ponds at Baldivis Facility. During temporary suspension no additional liquor will be generated from processing activities and therefore there will be limited transfer of liquor between the refinery and the Baldivis facility. Once all potential transfers from the refinery are complete, the main ingress of water into the ponds during temporary suspension will be stormwater from the catchment area.

2.3 Application summary

On 1 October 2025, the works approval holder submitted an application seeking approval to amend works approval W6682. The works approval holder applied to change the methodology and associated equipment used for solids removal from Evaporation Cells (EC) 2 and 3, and to remove the requirement to upgrade the balance pipes between ECs 1, 2, and 3.

2.3.1 Current solids removal

Nickel and ammonium sulfate salts and other residual solids which accumulate within the ECs are currently removed using a purpose-built robotic vacuum dredge in accordance with condition 2, table 2, item 3 in W6882 (as approved 12 June 2024). The robotic dredge pumps the solids/salts and all other sediments (sands and other organics) from the ECs and produces a mixed product. The mixed product is screened to remove the sediments and produce a nickel salt that the works approval holder can sell onto third parties. The sediments are sent to an adjacent cell (as approved in the current works approval W6882). The sediments are then either sold or disposed of at a licenced waste facility.

During the dredging of EC2 the works approval holder encountered a 300-millimetre-thick layer/crust of salts along the embankment 2 metres up from the toe of the slope. The purpose-built robotic dredge, which was used for dredging EC 1, was unable to breakthrough the crust to recover the salts. As a result, the dredging activities were suspended and alternative methods to remove the salts was required to be established.

2.3.2 Proposed changes to solids removal

The works approval holder has requested that W6682 is amended to permit two alternative methods for the removal of the solids in the ECs. These methods include a modified robotic dredge and the option of using mobile earth moving equipment for solids removal.

The works approval holder has requested W6882 is amended to allow for a newly designed and constructed robotic dredge, which is currently in concept stage. The dredge would be equipped with mechanical assistance to allow the disruption of the crust and water jets to further displace the salts. Upon successfully breaking through the crust, dredging will be undertaken under the liquor surface with no additional emissions generated.

Solids extracted by the dredge will be conveyed to the laydown area where they will be screened and residual solids will be pumped into an adjacent cell in accordance with condition 2, table 2, item 3 (g-h) in W6882.

Removing the salts using the robotic dredge will be prioritised as the method of choice, however, should this method prove ineffective, the works approval holder requested W6882 is amended to allow for the use of mobile equipment. such as an earthmoving excavator, as an alternative or in addition to the robotic dredge such that:

- If it has been determined that the solids/salts are to be removed via an excavator only, the material will have been considered dry, and therefore the salts and sediments cannot be separated. The material will be packaged for sale to a third party.
- If it has been determined that the solids/salts are to be removed using both methods, and if the liner has not been damaged by the excavator during this process, then effluent will be pumped back into the EC and the salts subsequently recovered using

the robotic dredge and transported back to the refinery in accordance with condition 2, table 2, item 3 (g-h) in W6882.

2.3.3 Current balance pipes

The Premises balance pipes provide a conduit for balancing the level of liquor between the ECs, and for additional storage capacity during operational periods. The balance pipes are currently located in the shared embankments between EC1 and EC2 as well as EC2 and EC3 (see Figure 1). There are three 450mm diameter pipes in the EC1 and EC2 shared embankment, and two 450 mm pipes in the EC2 and EC3 shared embankment.

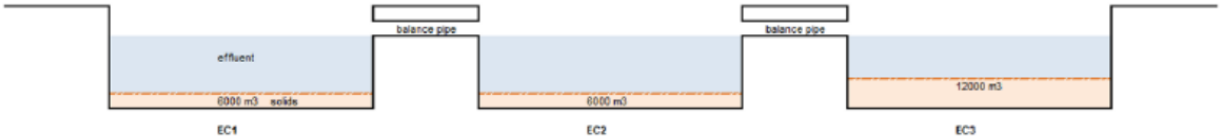

Figure 1: The existing arrangement of balance pipes between ECs 1, 2 and 3.

Condition 5, Table 5 of W6882 as approved 12 June 2024, describes the requirements for replacement of the balance pipes during the EC relining works such that:

Replacement of balance pipes

(ll) Pipe shall be mechanically blocked on operational side to allow replacement of balance pipe during construction;

(mm) New balance pipe area to be excavated to allow for concrete encasement and weld connection area for the liner with the HDPE plate;

(nn) HDPE plate of at least 4mm shall be used; and

(oo) Balance pipe to extend at least 100mm beyond the batten bar connection to prevent discharge to the upstream edge of the connection..

2.3.4 Proposed amendment to balance pipe removal

The works approval holder has stated that during temporary suspension the balance pipes will not be required as only limited liquor will be transferred from the Kwinana Refinery to the ECs and, if required, an existing pumping system will be used to decant liquor between the ECs.

As the balance pipes are estimated to be at 700mm below the embankment crests, the works approval holder considers significant excavation will be required for their removal and replacement. The works approval holder considers the replacement of balance pipes poses a high-risk to the EC stability as the freeboard of the adjacent EC will be at a level higher than the excavation depth of the pipes.

The works approval holder has requested that the existing pipes remain, and the requirement for replacement of the balance pipes be removed from W6882. However, the works approval holder recommends that the current balance pipes are to be sealed on either side during the EC relining works.

3. Other approvals and legislative requirements

3.1 Part IV of the EP Act

Ministerial Statement (MS) 377 (as amended) was published on 18 January 1995 and applies to the Premises. The proposal covered by MS 377 is the Tailing Pond Rehabilitation Project and Effluent Management System Upgrade, Baldivis. Conditions of this approval require the works approval holder to comply with a series of environmental commitments for the Premises. The Environmental Protection Agency (EPA) advised the works approval holder in May 2019 that the commitments set out in MS 377 had been met and are no longer required to be reported on. In addition, these are not considered relevant to this works approval

amendment application. The relining works is not expected to have significant environmental impacts and therefore referral under Part IV of the EP Act is not required.

3.2 Other approvals

Table 1: Associated legislative requirements

Legislation	Approval ref.	Expiry	Details
Environmental Protection (Clearing of Native Vegetation) Regulations 2004	CPS 9105/2	19/6/2042	Permit which authorises the clearing of native vegetation across multiple lots that form part of the Premises
Rights in Water and Irrigation Act 1914	GWL64889(7)	18/08/2028	Annual water entitlement 800,000kL
Rights in Water and Irrigation Act 1914	CAW208714	12/05/2024	26D for the installation of three recovery bores at the Baldivis Facility – works complete

4. 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.

4.1 Source-pathways and receptors

4.1.1 Receptors

In accordance with the *Guideline: Risk Assessment* (DWER 2020), the Delegated Officer has excluded the licence holder'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 2 below provides a summary of potential human and environmental receptors that may be impacted by the emission and discharges from the prescribed premises as a result of the proposed amendments to the works approval *(Guideline: Environmental Siting* (DWER 2020)).

Table 2: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Residential dwellings	Residential dwellings are located within 690m south, and 1520m northeast of the prescribed activity.
Baldivis residential area	Approximately 700m south of the ECs within the premises boundary
Environmental receptors	**Distance from prescribed activity**
Environmentally Sensitive Area	Within Prescribed Premises boundary, south of the

	ECs
Threatened Ecological Communities - “Tuart (Eucalyptus gomphocephala) Woodlands and Forests of the Swan Coastal Plain”	Within Prescribed Premises boundary, south and south-west of the ECs
Threatened fauna- Black Cockatoo and Carnabys Cockatoo	Within Prescribed Premises boundary
Groundwater	Groundwater is located at approximately 0.5 to 2 metres AHD
Lake Cooloongup	600m west of the Prescribed Premises boundary

4.1.2 Emissions and pathways

The key emissions and associated actual or likely pathways during premises operation which have been considered in this decision report are detailed in Table 3 below. Table 3 also details the control measures for these emissions, where necessary.

4.2 Risk ratings

Table 3 describes the risk events associated with the potential change of emission and discharges from the prescribed premises as a result of the proposed amendments to the works approval. This is consistent with the *Guideline: Risk Assessments* (DWER 2020). In accordance with this guideline, the Delegated Officer has excluded the works approval holder'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.

The mitigation measures/controls proposed by the works approval holder in the October 2025 application have been considered by the Delegated Officer when determining the final risk rating. Where the Delegated Officer considers the works approval holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the works approval holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in the table below. The conditions in the works approval have been determined in accordance with *Guidance Statement: Setting Conditions* (DWER 2015).

Table 3: Risk assessment of potential emissions and discharges from the premises prescribed premises as a result of the proposed amendments to the works approval

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**				
Operation								
Use of mobile equipment for solids removal	Dust from disturbance of hard and non-friable solid	**Pathway:** Air/windborne pathway **Impact:** Health and amenity of humans and fauna, and to surrounding vegetation	Residences 690m south Threatened flora and fauna (within prescribed boundary)	• Minimise dust generating activities during periods of high wind. • Application of dust suppression as required	**C – Slight** **L – Unlikely** **Risk – Low**	Yes	Condition 12 standard complaints reporting	The delegated officer considers that applicants controls are adequate to mitigate potential dust impacts to residents and the surrounding environment. No additional controls will be included in addition to those of the former version of the works approval.
	Dust from disturbance of friable solids			• Minimise dust generating activities during periods of high wind. • Application of dust suppression as required • Refill ponds with liquor to prevent dust dispersion	**C – Minor** **L – Unlikely** **Risk – Medium**			
Breach of associated infrastructure causing discharge to land during solids removal with the robotic dredge	Contaminated water	**Pathway:** transport or infiltration **Impact:** Contamination of groundwater or surrounding environment	Groundwater, below base of EC's Surrounding ESA (vegetation and soils), Lake Cooloongup 600m west	• Weekly monitoring during solids removal as per condition 4, table 4 in W6882 • Active leak detection system. • Routine inspections and monitoring in accordance with premises operations surveillance and maintenance manual • Recovery bores installed as per condition 3, table 3 in W6882 • Inspection and where required, repair of liners prior to filling of liquor	**C – Major** **L – Possible** **Risk - Medium**	Yes	Adjusted 'Design and removal requirements' for Table 2, Item 3 (a), (b) and (g). Existing installation of groundwater monitoring wells as detailed in Table 3. Existing groundwater monitoring requirements as detailed in Table 4.	The delegated officer considers that existing conditions 3 and 4 are adequate to address potential risks associated with the release of contaminated water to the environment. However, due to a change in removal of solids, the Delegated Officer considers the adjustment of the wording of Table 2, Item 3 (a), (b) and (g) was necessary to acknowledge the change of solids removal.
Breach of associated infrastructure causing discharge to land during solids removal with mobile equipment								
Removal of the solids Vehicle movements	Noise	**Pathway:** Air/windborne pathway **Impact:** Health and amenity of humans and fauna	Residences 690m south Threatened fauna (within prescribed boundary)	• Nil	**C – Slight** **L – Rare** **Risk – Low**	Yes	Condition 12 standard complaints reporting	The delegated officer does not consider this amendment is likely to increase the potential noise impacts to residents and fauna and considers that applicants controls are adequate to mitigate this risk. No additional controls will be included in addition to those of the former version of the works approval.

Note 1: Consequence ratings, likelihood ratings and risk descriptions are detailed in the Guidance Statement: Risk Assessments (DER 2017).

5. Decision

Based on the assessment in this amendment report, the Delegated Officer has determined that an amended works approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements. The Delegated Officer's reasoning and grounds for imposing any additional regulatory controls can be found in Table 3, with additional rationale below.

Solids removal

The Delegated Officer has included the use of mobile earth moving equipment for the removal of solids from the ECs when they are unable to be removed by the robotic dredge. The wording for Table 2, Item 3 (a), (b) and (g) have been adjusted and (i) added to acknowledge the potential use of mobile earth moving equipment and the redesigning of the current robotic dredge to suit the dredging requirements.

Balance pipes

The Delegated Officer has considered the request to remove the requirement of replacing the balance pipes at the Premises. The works approval holder's request is described in section 2.3.4 of this Amendment Report.

The Delegated Officer understands that removal of the balance pipes may risk the stability of the ECs during the relining works.

It is understood that instead of removal and replacement of the balance pipes, the works approval holder wishes to seal the current balance pipes during the relining works to prohibit liquor from entering another ECs during the relining works. If required, they have suggested using an existing pumping system to decant liquor from one EC to another during the relining works. The potential use of the existing pumping system has been included in W6882 as Table 2, Item 4 (e).

The Delegated Officer has taken into account that during temporary suspension there is likely to be limited liquor deposited in the ECs. Therefore, the use of a pumping system may be suitable.

Given the above, the Delegated Officer has removed the requirement for replacing the balance pipes. However, new conditions have been included in the amended works approval to reflect the use of the pumping system, and the temporary sealing of the current balance pipes during relining works. Following relining works the pipes are required to be unsealed to continue to be used as an operational function of the ECs.

6. Consultation

The works approval holder was provided with a draft of the revised works approval and amendment report on 25 November 2025. Comments were received by the works approval holder on 2 December 2025. The works approval holder's comments, and the Department's response is documented in Table 4 below:

Table 4: Consultation

Condition	Comments received	Department response
Condition 2, Table 2, Item 3 (b)	**Current wording**: The robotic dredge shall be designed to avoid intersection with the existing	The Department accepts this change.

	liner **Proposed change** "The robotic dredge shall be designed to avoid damage of the existing liner". **Justification**: The robotic dredge has been designed with engineering and operational controls to prevent liner damage and compromise to the existing system.	
Condition 2, Table 2, Item 4 (e)	**Current wording**: Pumping system is available to decant liquor between the evaporation cells to avoid overtopping. **Proposed Change** "A pumping system shall be available for use as required to manage effluent levels between the cells and prevent overtopping" **Justification**: Draft W6882 – Condition 5 Table 5 Effluent levels are managed under an Operating Management Strategy with relevant triggers in place to allow adequate time to mitigate any risks associated with overtopping.	The Department accepts this change.
Condition 5, Table 5, Item 1 (ll)	**Current wording**: During temporary suspension the balance pipes shall be mechanically blocked by a HDPE plate on both ends; **Proposed Change** "Balance pipes shall be mechanically blocked at both ends" **Justification**: Balance pipes will be permanently blocked and no longer utilised. Other triggers will be in place in the Operating Management Strategy for Evaporation Cells to mitigate the risks. BHP is currently updating internal documentation in liaison with a third party.	The Department accepts this change.

7. Conclusion

Based on the assessment in this amendment report, the Delegated Officer considers the amendments to the activities associated with the works approval do not change the risk profile of the premises. Therefore, the Delegated Officer has determined that this amended works

approval will be granted, subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

Caron Goodbourn
MANAGER, PROCESS INDUSTRIES

An officer delegated by the CEO under section 20 of the EP Act

References

1. Department of Environment Regulation (DER) 2017, *Guidance Statement: Risk Assessments*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2019, *Guideline: Decision Making*, Perth, Western Australia.
3. Application to amend works approval W6882/2024/1 – BHP Nickel West Pty Ltd
4. Baldivis Evaporation Cells – Relining Engineering and Design (WSP Golder, December 2023)
5. Works Approval Amendment Supplementary Information Baldivis Evaporation Cells Relining Project – Dredge methodology change (BHP NiW, 30 September 2025).
6. Works Approval W6882/2024/1 and Decision Report as approved 12 June 2024.