Amendment Report

Application for Works Approval Amendment

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

Works Approval Number	W6536/2021/1
Works Approval Holder	Genesis Minerals Limited
ACN	124 772 041
File Number	DER2021/000142
Premises	Ulysses Gold Project Mining tenements: G40/4, G40/5, G40/6, L40/11, L40/12, L40/30, L40/34, M40/20, M40/107, M40/110, M40/166, M40/288, M40/289, M40/290, M40/291 and M40/293. Shire of Menzies WA 6436 As defined by the premises maps attached to the Revised Works Approval
Date of Report	9/06/2023
Decision	Revised works approval granted

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1. Decision summary

Works Approval W6536/2021/1 is held by Genesis Minerals Limited (Works Approval Holder) for the Ulysses Gold Project (the Premises), located on several mining tenements[1] in the Shire of Menzies WA 6436.

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, the Delegated Officer has granted the Revised Works Approval.

2. Scope of assessment

2.1 Regulatory framework

In completing the assessment documented in this Amendment Report, the department has considered and given due regard to its Regulatory Framework and relevant policy documents which are available at https://dwer.wa.gov.au/regulatory-documents.

2.2 Application summary

On 10 January 2023 the Works Approval Holder submitted an application to the department to amend Works Approval W6536/2021/1 under section 59 and 59B of the *Environmental Protection Act 1986* (EP Act). The following amendments are being sought to further develop the Ulysses Gold Project:

- Construction of new dewatering infrastructure:
    - Stage 1: main pipeline from the turkey's nest near the Ulysses Central Pit to the Danluce Pit (Figure 1). Minor pipelines from the Ulysses mining pits to the turkey's nest, and minor pipelines from the Admiral, Butterfly, Clark, and King (ABCK) pit area to the Danluce Pit;
    - Stage 2: new pipeline from the ABCK pits to the Orient Well Pit;
- Time-limited operation (TLO) of new dewatering infrastructure:
    - Stage 1: Discharge dewater from the Ulysses mining area to the Danluce pit via the turkey's nest;
    - Stage 2: If Danluce pit reaches maximum capacity, discharge dewater from the ABCK mining area and Danluce pit into the Orient Well Pit; and
    - Dewater used for dust suppression at Ulysses pits and ABCK pits, with excess water from both areas to be pumped to the Danluce pit; and
- Increased dewatering throughput capacity to 640,000 kL per annum.

This amendment is limited only to changes to Category 6 activities from the existing Works Approval. No changes to the aspects of the existing Works Approval relating to Category 5 and 54 have been requested by the Works Approval Holder.

Table 1 below outlines the proposed changes to the existing Works Approval.

[1] Mining Tenements G40/4, G40/5, G40/6, L40/11, L40/12, L40/30, L40/34, M40/20, M40/107, M40/110, M40/166, M40/288, M40/289, M40/290, M40/291 and M40/293.

Table 1: Proposed throughput capacity changes

Category	Current throughput capacity	Proposed throughput capacity	Description of proposed amendment
6	250,000 kL per annum discharge of mine dewater	640,000 kL per annum discharge of mine dewater	Additional 390,000 kL per annum of mine dewater throughput capacity

2.2.1 Dewatering operations

The Works Approval holder is now planning to commence mining at the premises prior to the construction of the Ulysses Processing Plant and tailings storage facility (TSF). As a result, there is a requirement to commence dewatering and transfer excess water from the underground and open pits to the existing open pits to enable the planned mining activities.

The Ulysses Underground Mine portal in the Ulysses West Pit is to be developed first, which currently has a water body that formed from the accumulated of around 40,000 kL of stormwater and groundwater inflow. While a portion of this water will be used for dust suppression, the remaining surplus water is to be transferred into the Ulysses Central Pit.

In 2022, the Works Approval holder engaged Groundwater Resource Management (GRM) to undertake a hydrological and hydrogeological assessment (GRM 2022), including a water balance, associated with the longer-term transfer of water between the pits. The GRM assessment determined that following mine pits will need to be emptied to allow for mining development:

- Ulysses West and Central Pits, to allow for the construction of the underground portal;
- The 'ABCK' Pits; and
- Once the cutbacks at ABCK are completed, both the Danluce and Orient Well Pits will require dewatering to allow for development of those pits.

Based on the water balance assessment, the main dewatering pipeline is to be constructed in two stages. The Stage 1 dewatering pipeline (Figure 15 of the amended Works Approval) will enable transfer of dewater from the Ulysses Mining Area to the ABCK mining area for discharge into the Danluce Pit. Stage 1 will also comprise the installation of minor pipelines connecting the Ulysses underground operations, Ulysses West Pit, Ulysses Central Pit to the Ulysses turkeys nest and minor pipelines connecting the ABCK Pits with the Danluce Pit and main dewatering pipeline. The Stage 1 dewatering pipeline will be a 250mm diameter PN6.3 high-density polyethylene (HDPE) pipeline and is approximately 7km long and is to be constructed in July 2023.

The Stage 2 dewatering pipeline (Figure 16 of the amended Works Approval) will connect the ABCK mining area to the Orient Well mining area for discharge into the Orient Well Pit. The Stage 2 dewatering pipeline is required if the Danluce Pit reaches maximum capacity, there is a shortfall of water and for the dewatering of the Orient Well Pit. The Orient Well and Danluce Pits will be mined following the completion of the ABCK mining and water stored within Danluce and Orient Well will then be pumped back to the Ulysses or ABCK Pits. The Stage 2 Dewatering Pipeline will be a 250mm diameter PN6.3 HDPE pipeline approximately 6.5km long and will be constructed in July 2024.

Pipelines will be constructed using poly welding to join individual sections, with flanged control valves to direct flow between discharge points. The proposed transfer pipeline network for both Stage 1 and Stage 2 is displayed in Figure 1.

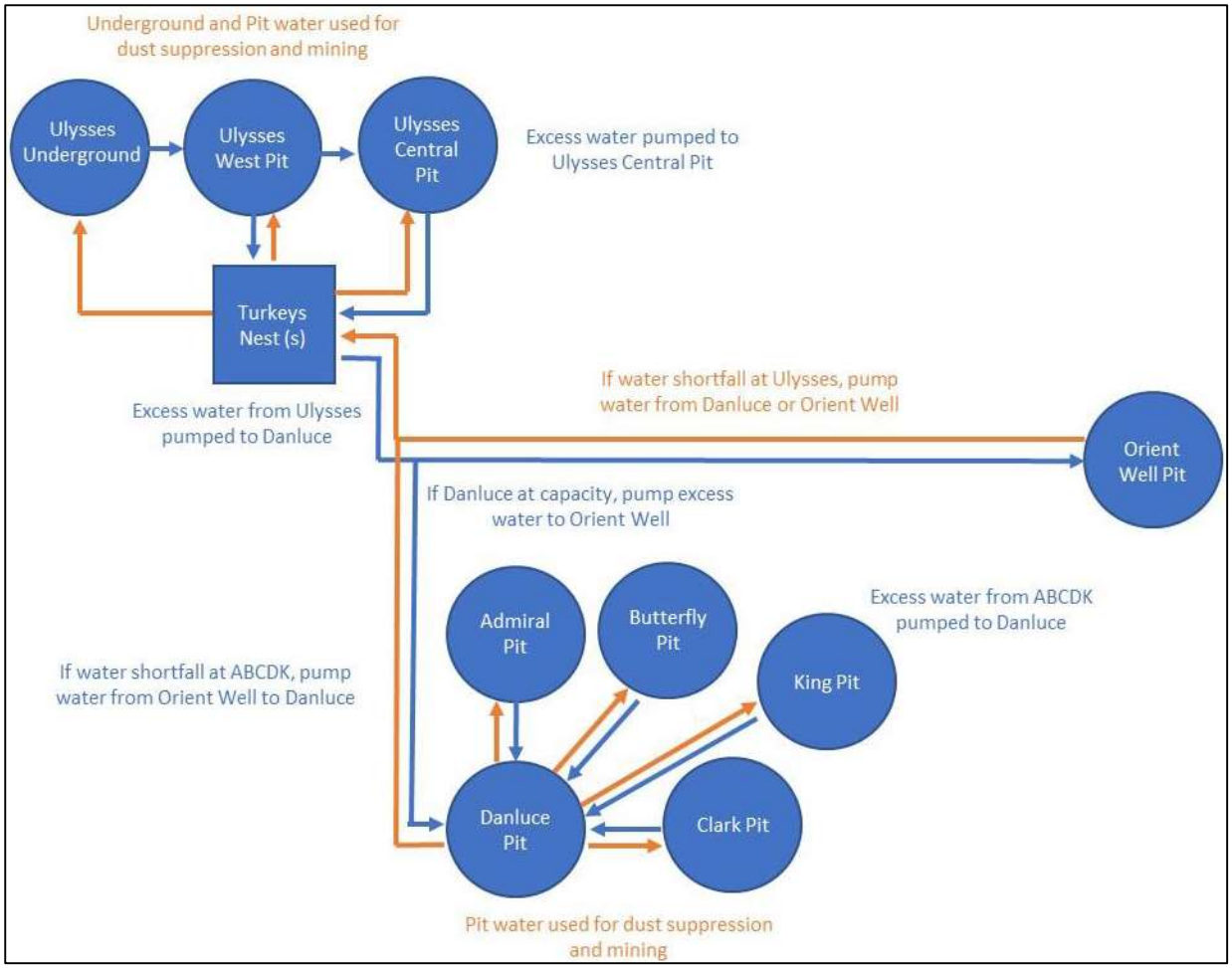

Figure 1 Proposed dewatering pipelines

GRM developed an updated water balance model using GoldSim software to simulate the processes around the operational and mined pits. The groundwater processes were based on the previous hydrogeological assessments undertaken for the premises. The hydrogeological assessment estimated that there is sufficient capacity in both the Danluce and Orient Well Pits to store excess water from the Ulysses and ABCK mining operations.

Two model scenarios were undertaken by GRM representing the Lower and Higher Case groundwater inflow predictions. The Higher Case scenario represents the worst-case condition in the context of storing excess water. GRM noted that the actual mining schedules may vary from the schedules used for the model, however the overall results would be similar.

In consideration of the modelling results, GRM recommended that the primary discharge pit, the Danluce pit lake, should have a maximum water level of 425m AHD, which is about 5 m below the surrounding ground surface. The intent of this control is to avoid impacts on the surrounding vegetation related to mounding of pit lake water into the vegetation root zone.

No significant changes to groundwater quality are anticipated as groundwater sampling in the vicinity of all mine pits from 2019 to 2021 indicates fresh to brackish quality with salinities ranging between 1,000 and 7,000 mg/L total dissolved solids (TDS). Concentrations of metals were mostly at, or near, detection limits. Nitrate concentrations were high in all samples which is characteristic of the natural groundwater within the goldfields. No groundwater samples exceeded the ANZECC stock watering limits.

4. Legislative context

4.1 Part V of the EP Act

Under the EP Act, the clearing of native vegetation is an offence unless it is done under the authority of a Clearing Permit or an exemption applies. The Works Approval holder has been issued Clearing Purpose Permit CPS 7052/3 for the clearing of up to 280 ha on tenement M40/166 and Clearing Purpose Permit CPS 9132/1 for the clearing of up to 580 ha on tenements L40/10, L40/17-18, L40/30-34, M40/3, M40/101, M40/107, M40/110, M40/120, M40/137, M40/288, and M40/340. These permits are valid to 31 August 2026 and 15 November 2026, respectively, and cover any clearing required for the installation of the proposed dewatering infrastructure.

4.2 Mining Act 1978

In July 2021, the Works Approval holder submitted an amended Mining Proposal v9 (MP Reg ID 97388) and Mine Closure Plan (Reg ID 97388) for the expanded Ulysses Gold Project. These documents were approved by the DMIRS on 20 October 2021. The Works Approval holder submitted another mining proposal (the Ulysses Gold Project Mining Proposal Version 10.0 - Reg ID 112250) on 27 June 2022 which is currently under assessed assessment by DMIRS. This proposal is primarily related to changes to the Admiral Pit, Clark Pit, Clark North Pit, Admiral WRL and Butterfly WRL designs. No changes to the Danluce Pit or Orient Well Pit are proposed.

An amendment to mining proposal (Version 10.1) was submitted on 24 February 2023, following a request for further information from DMIRS. The amendment includes the dewatering pipeline under “Other mining activities” category for the following tenements: L40/30, L40/34, M40/101, M40/107, M40/137, M40/288 and M40/340.

4.3 Rights in Water and Irrigation Act 1914

The Works Approval holder has two existing 5C licences to take water issued under the *Rights in Water and Irrigation Act 1914* (RiWI Act). Groundwater licence GWL 182709(4) has been issued for mine dewatering and GWL 173529(5) relates to groundwater abstraction from the Orient Well Borefield and is not specifically related to this amendment application. An amendment application for GWL 182709(4) was submitted in March 2022 and is still under assessment; however, the proposed changes do not constrain this amendment application.

5. 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.

5.1 Source-pathways and receptors

5.1.1 Emissions and controls

The key emissions and associated actual or likely pathway during premises construction and operation which have been considered in this Amendment Report are detailed in Table 2 below. Table 2 also details the proposed control measures the Works Approval Holder has proposed to assist in controlling these emissions, where necessary.

Table 2 Works Approval Holder controls

Emission	Sources	Potential pathways	Proposed controls
Construction			
Dust	Vegetation clearing, earthworks and vehicle movement on unsealed roads	Air/wind dispersion	a) Minimise exposed subsoil through progressive clearing during construction b) Regular visual monitoring and implement appropriate dust controls as required c) Regular watering using water carts across active work areas during construction d) Use defined access roads with speed restrictions applied
Operation			
Brackish mine dewater (1,000 – 7,000 mg/L)	Spills and leaks from dewater transfer pipelines	Direct discharge to land and infiltration	Infrastructure/equipment: a) Constructed using HDPE material that meets AS/NZS 2033:2008, AS/NZS 4129:2008, AS/NZS 4130:2009, AS/NZS 4131:2010 b) Telemetry systems and pressure sensors along pipelines to allow the detection of leaks and failures c) Flow meters to measure discharge volumes d) Isolation valves installed at appropriate intervals e) Install pipelines within earthen bunded corridors with scour pits or sumps constructed along the pipeline route at strategic locations and low point. f) The discharge pipe will be located far enough over the pit crest or down the pit ramp to reduce exposure to wind and prevent scouring of pit walls Monitoring: g) Daily inspections of dewatering pipelines to confirm visual integrity of pipelines, bund and scour pits during operation h) Shutdown required section of dewatering system if any leaks or spills from the pipeline are detected until the leak has been repaired
	Seepage of receiving pit lakes	Infiltration	a) Ensure Danluce pit lake is maintained below maximum water level of 425m AHD (5 m below the surrounding ground surface) b) Install flow meters and record the volume of water discharged each month c) Monthly monitoring of dewater pH and electrical conductivity at discharge point at Ulysses Central Pit, Danluce Pit or Orient

			Pit (whichever is in operation)
	Overtopping of receiving pit lakes	Surface runoff and infiltration	a) Ensure Danluce pit lake is below maximum water level of 425m AHD (5m below the surrounding ground surface) b) Install flow meters and record the volume of water discharged each month c) Monthly monitoring of pit lake water level (freeboard capacity) and quality d) Transfer (if required) any excess mine dewatering to the Orient Well Pit.

5.1.2 Receptors

In accordance with the *Guideline: Risk assessments* (DWER 2020), the Delegated Officer has excluded employees, visitors and contractors of the Works Approval holder from this assessment. Protection of these parties often involves different exposure risks and prevention strategies, and is provided for under other state legislation.

Table 3 below provides a summary of potential human and environmental receptors that may be impacted by activities upon or emission and discharges from the prescribed premises *(Guideline: Environmental siting* (DWER 2020)).

Table 3: Sensitive human and environmental receptors and distance from prescribed activity

Human receptors	**Distance from prescribed activity**
Goldfields Highway	Runs south-west to north-east between Ulysses West and Ulysses Central pits, <200m from both pits.
Environmental receptors	**Distance from prescribed activity**
Native vegetation, including Priority 3 flora (*Calytrix Hislopii*)	Population exclusion zone 30 m southwest and 190 m southeast of prescribed premises boundary and >370 m south of the Danluce Pit.
Surface water lines	Small shallow diffuse drainage lines from the west of the project extend to roughly Butterfly Pit and drain towards a floodplain north of the premises. Dingo Creek (a defined stream that passes close to western edge of Orient Well pit and discharges into the Lake Raeside valley east of the project). Smaller tributaries of Dingo Creek cross project infrastructure west and east of Orient Well Pit. Streams next to Ulysses West, Admiral and Orient Well Pits are large enough to provide a floodwater ingress risk.
Groundwater	The standing water level measured near the Ulysses mining area ranges from 22.9 meters below ground level (mbgl) to 32.9 mbgl with TDS ranging from 920 – 4,120 mg/L. Groundwater contained in the pits is fresh to brackish (1,000-7,000 mg/L TDS). Geochemistry of the groundwater in the pits is similar to regional groundwater.

5.2 Risk ratings

Risk ratings have been assessed in accordance with the *Guideline: Risk Assessments* (DWER 2020) for those emission sources which are proposed to change and considers potential source-pathway and receptor linkages as identified in Section 5.1. Where linkages are in-complete they have not been considered further in the risk assessment.

Where the Works Approval Holder has proposed mitigation measures/controls (as detailed in Section 5.1), these have been considered when determining the final risk rating. Where the Delegated Officer considers the Works Approval Holder's proposed controls to be critical to maintaining an acceptable level of risk, these will be incorporated into the works approval as regulatory controls.

Additional regulatory controls may be imposed where the Works Approval Holder's controls are not deemed sufficient. Where this is the case the need for additional controls will be documented and justified in Table 4.

The Revised Works Approval W6536/2021/1 that accompanies this Amendment Report authorises construction and time-limited operations. The conditions in the Revised Works Approval have been determined in accordance with *Guidance Statement: Setting Conditions* (DER 2015).

A licence is required following the time-limited operational phase authorised under the works approval to authorise emissions associated with the ongoing operation of the Premises. A risk assessment for the operational phase has been included in this Amendment Report, however licence conditions will not be finalised until the department assesses the licence application.

Table 4 Risk assessment of potential emissions and discharges from the Premises during construction and operation

Risk Event					Risk rating[1] C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors & potential impact**	**Works Approval Holder's controls**				
Construction								
Movement of mobile equipment (e.g. light vehicles and heavy equipment) during installation of dewatering pipelines and pipeline bunding	Dust	Air/windborne pathway	Impacts to *Calytrix Hislopii*/ native vegetation health Reduced visibility on Goldfields Highway	Refer to Section 5.1.1	C = Minor L = Slight **Low Risk**	Y	Condition 1 – Dust suppression controls during construction	N/A
Operation (including time-limited-operations operations)								
Spills and leaks of mine dewater transported in pipelines	Mine dewater: (fresh to brackish water: 1,000 – 7,000 mg/L TDS)	Mine water leaking or rupturing from pipeline and directly discharged to land	Contamination of soil and groundwater (changes to salinity) Adverse impacts to adjacent native vegetation health (including *Calytrix Hislopii*)	Refer to Section 5.1.1	C = Minor L = Possible **Medium Risk**	Y	Condition 1 – installation of isolation valves, flow and leak detection systems in pipelines, installation of pipelines on earthen bunds with scour pits or sumps Condition 14 – Environmental commissioning of pipelines Condition 25 – pipeline operational requirements Condition 26 – Daily pipeline inspections	N/A
Overtopping of receiving pits: Danluce, Orient Well, Ulysses Central Pit		Direct infiltration and runoff			C = Moderate L = Possible **Medium Risk**	Y	Condition 25 – maintain 5 m freeboard on Orient Well Pit, Danluce Pit and Ulysses Central Pit	N/A

Risk Event					Risk rating[1] C = consequence L = likelihood	Works Approval Holder's controls sufficient?	Conditions[2] of works approval	Justification for additional regulatory controls
Source/Activities	**Potential emission**	**Potential pathways and impact**	**Receptors & potential impact**	**Works Approval Holder's controls**				
							Condition 28 – Monitoring of water quality entering pits, limit on standing water level in Danluce pit Condition 32 – Recording of water quality monitoring	
Seepage and groundwater mounding of receiving pit: Danluce, Orient Well, Ulysses Central Pit		Seepage of mine dewater through base and walls of pits to soil and groundwater	Contamination of soil and groundwater (changes to salinity)		C = Minor L = Possible **Medium Risk**	Y	Condition 25 – Authorised discharge points specified for each pit Condition 28 – Monitoring of water quality entering pits Condition 32 – Recording of water quality monitoring	N/A

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

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

6. Consultation

Table 5 provides a summary of the consultation undertaken by the department.

Table 5 Consultation

Consultation method	Comments received	Department response
Local Government Authority – Shire of Menzies advised of proposal (30/03/2023)	None received	N/A
Local Government Authority – Shire of Leonora advised of proposal (30/03/2023)	None received	N/A
Department of Mines, Industry Regulation and Safety (DMIRS) advised of proposal and sought confirmation that the applicant still has the appropriate approvals under the *Mining Act 1978* for the proposal (30/03/2023)	Comments received 19/04/2023 stating DMIRS is still assessing the proposal. DMIRS received the proposal on 27 June 2022 and found the proposal not acceptable from a geotechnical point of view. The proponent submitted an amended mining proposal on 24 February 2023 along with a Mine Pit Water Balance which DMIRS are currently assessing.	Comment noted.
Department of Planning, Lands and Heritage advised of proposal and sought comment on obligations under the *Aboriginal Cultural Heritage Act 2021* and confirmation of relevant Aboriginal stakeholders (30/03/2023)	Comments received 27/04/2023 stating the proposal does not intersect with any Aboriginal sites or heritage places and therefore approval under the *Aboriginal Heritage Act 1972* is not required.	Comment noted.
Pastoral Lease – Melita Station advised of proposal (30/03/2023)	None received	N/A
Watarra Aboriginal Corporation RNTBC – Representative of the Darlot Native Title advised of proposal (30/03/2023)	None received	N/A
NTS Goldfields Ltd - Representative of the Native Title Nyalpa Pirniku advised of	None received	N/A

proposal (30/03/2023)		
Works Approval Holder was provided with draft amendment on 01/06/2023	Comments received 1/06/2023: 1. Update registered business address and mining tenements in the Amendment Report and Works Approval	Registered business address and premises description amended accordingly.
	2. GRM recommends that Danluce pit lake should have a maximum water level of 425m AHD which is approximately 5 m below the surrounding ground surface. Request operational freeboard is set at 5 m from the ground surface at all times at the Ulysses Central Pit, Danluce Pit, and Orient Well Pit under Table 9 of the Works Approval	Amended minimum freeboard to 5 m bgl
	3. Update description of '0.5 m freeboard' in Table 4 of the Amendment Report to reflect the proposed 5 m freeboard.	Amended to 5 m freeboard

7. Conclusion

Based on the assessment in this Amendment Report, the Delegated Officer has determined that they intend to grant the Revised Works Approval, pending approval from DMIRS for the proposed works under the *Mining Act 1978*. The Revised Works Approval is subject to conditions commensurate with the determined controls and necessary for administration and reporting requirements.

The Revised Works Approval has been issued in a contemporary format, with existing conditions being transferred, but not reassessed, to the new format.

7.1 Summary of amendments

Table 6 provides a summary of the proposed amendments and will act as record of implemented changes. All proposed changes have been incorporated into the Revised Works Approval as part of the amendment process.

Table 6 Summary of works approval amendments

Condition no.	Proposed amendments
Cover page	Revised premises location description. Assessed production capacity revised from 250,000 kL per annual period to 640,000 kL per annual period.
1	Table 1, Row 3 - Additional dust controls for construction of dewatering pipelines
25	Table 9, Row 3 – Addition of freeboard operational requirement for Ulysses Central Pit, Danluce Pit and the Orient Well Pit
27	Table 11, Row 4 - Ulysses Central Pit, Danluce Pit and the Orient Well Pit added as authorised discharge points
28	Table 12 - Discharge monitoring added for Ulysses Central Pit, Danluce Pit and the Orient

	Well Pit. Limits added for volumetric discharge in all pits and limit on standing water level in Danluce Pit.
Schedule 1	Amended Figure 1- Prescribed premises boundary map to show entire extent of premises and improve clarity. Added Figure 15 - Map of labelled pits as reference for New Condition 28. Added Figure 16 and 17 – Stage 1 and 2 dewatering infrastructure location, with all mining tenements clearly labelled (including those added to premises boundary).
Schedule 2	Deleted premises boundary coordinates given boundary now aligns with Mining Tenements listed on cover page.
Schedule 3	Now Schedule 2.

References

1. Department of Environment Regulation (DER) 2015, *Guidance Statement: Setting Conditions*, Perth, Western Australia.
2. Department of Water and Environmental Regulation (DWER) 2020, *Guideline: Environmental Siting*, Perth, Western Australia.
3. DWER 2020, *Guideline: Risk Assessments*, Perth, Western Australia.
4. Groundwater Resource Management (GRM) 2022, *Mine Pit Water Balance – Ulysses Gold Project.* Prepared for Genesis Minerals Limited.