



Submission to EnergyAustralia and DEECA on the Limitations of the DMRP for Yallourn Mine

Protecting Ramsar Values and Community Interests: Risks,
obligations, and required safeguards for Yallourn mine closure

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Executive Summary

Context

- The Gippsland Lakes and Lower Latrobe Wetlands are internationally recognised Ramsar sites, already in ecological decline due to a 129 GL/year environmental water deficit and climate-driven runoff reductions.
 - Yallourn mine rehabilitation choices carry high risks for Ramsar values, Traditional Owner rights, and community confidence.
 - The June 2025 **DMRP** underestimates foreseeable **hydrological, geotechnical, ecological, cultural, reputational and financial risks**.
 - Any plan that normalises MRD overtopping or diverts Morwell River water into a terminal pit lake is inconsistent with Victoria's water strategies, Ramsar obligations, and contemporary rehabilitation policy.
-

FOGL's Key Concerns

1. MRD Structural Risk

- DMRP proposes lowering MRD levees and constructing “side-cast” weirs to spill into the pit.
- Overtopping dispersive earthen embankments is a proven failure mode; the 2012 MRD collapse caused river capture, pit inundation, and ~A\$150m in emergency works (ABC News, 2014).
- With a pit lake adjacent, rising pore-pressures and saturation would increase breach risk unless rebuilt to non-overtopping standards.
- Essential prerequisites: ANCOLD-aligned geotechnical design, ARR2019 hydrology, unsaturated–saturated slope modelling, and full third-party review.

2. Loss of Freshwater Inflows & Ramsar Risk

- MRD failure or interception would **withhold 120–180 GL/year** from the Latrobe.
- This is **4× AGL's Loy Yang application** and **2.5× the proposed combined cap** for Yallourn + Loy Yang.
- Reduced inflows would:
 - Increase salinity in Lake Wellington and wetlands.
 - Compress inundation frequency and duration.
 - Trigger changes to Ramsar ecological character (Hale et al., 2020).



- The **CGRSWS (2022)** explicitly calls for water recovery, not further extraction.

3. Pit-Lake Water Quality & Ecology

- Deep coal pits predictably stratify and develop anoxic hypolimnia.
- Consequences: nutrient recycling, toxic algal blooms, mobilised metals, mercury methylation, and poor habitat.
- Steep margins reduce littoral habitat; biodiversity is unlikely to recover.
- Without peer-reviewed coupled modelling and enforceable water-quality controls, a terminal pit lake is a long-term liability, not a safe “community asset.”

4. Cultural and Legal Obligations

- Traditional Owners affirm that “**water is life**”; the Latrobe’s 129 GL/year deficit already erodes cultural and ecological values.
- **Water Act 1989 (Vic), s.40**: Minister must preserve the Environmental Water Reserve and avoid adverse impacts on the environment.
- **EPBC Act water trigger**: Yallourn mine closure is a large coal mining development likely to significantly impact water resources, requiring federal referral.
- **Community trust** depends on transparency, independent expert review, and co-governance with GLaWAC and local stakeholders.

What FOGL Seeks

Assessment Standards

- EPBC referral under the water trigger and Ramsar provisions.
- New Victorian EES aligned with ANCOLD and ARR2019 practice.
- Independent expert review of all soil, hydraulic, hydrogeological, and limnological models, with full publication of assumptions and data.

MRD Redesign & Risk Controls

- Abandon “overtop into the pit” approach.
- Rebuild diversion for non-overtopping conveyance ($\geq 1\%$ AEP) with engineered spillways, cut-offs, filters, and seepage controls.
- Treat conduits as high-risk; remediate with structural backfill and filter diaphragms.



Flow Protection & Ramsar Safeguards

- Guarantee Morwell–Latrobe connectivity for baseflows and seasonal freshes up to at least 5-year ARI.
- Reject any option that withholds these flows to accelerate pit filling.

Conditional Water Access (if granted)

- Very-low-reliability, high-flow-only entitlements, with cease-to-pump triggers tied to environmental targets and Ramsar indicators.
- Telemetry on all pumping points; public dashboard and annual audits.
- Full-cost pricing reflecting externalities, with revenues hypothecated to environmental recovery and Traditional Owner cultural-water projects.

Liability and Financial Safeguards

- Rehabilitation bonds and long-term stewardship funds maintained until stability and water quality are independently verified.
- Embed Victoria’s new trailing-liability regime: regulator call-back powers, parent-company guarantees, and adequate tail insurance.
- Enforce licence conditions retaining proponent liability for downstream harm (salinity dieback, bloom-related fish kills).

FOGL’s Conclusion

A credible, lawful, and socially acceptable rehabilitation outcome must be breach-averse, flow-protective, and transparent. Anything less risks de facto river capture, degraded Ramsar values, and perpetual public liability. Rehabilitation must also ensure the costs of failure remain with those responsible, not with the community.

Embedding full-cost pricing, stringent MRD redesign, Ramsar-aligned flow safeguards, and enforceable liability frameworks—including Victoria’s trailing-liability regime—provides the only defensible pathway. With these measures in place, Yallourn’s closure can move from being a long-tail liability to a genuine opportunity: protecting the Latrobe River, restoring the Gippsland Lakes, and leaving a positive legacy for future generations.

Introduction

Yallourn mine’s rehabilitation is occurring in a sensitive hydrological context – it sits upstream of the Latrobe River system which feeds into the Gippsland Lakes, a Ramsar-listed wetland of international importance. The Gippsland Lakes system, including the



Lower Latrobe Wetlands (Dowd Morass, Heart Morass, and Sale Common), relies on sufficient freshwater inflows to maintain its ecological character (Hale et al. 2020). Over a century of industrial and water resource development has already significantly altered flow regimes; the region's rivers are over-allocated and climate change is exacerbating water scarcity. A Victorian government study found that long-term water availability in the Latrobe system declined by ~25% between 1997 and 2017 (from ~800 GL/year to ~600 GL/year), and is projected to fall to ~467 GL by 2050 under climate change (DELWP 2020a). In this context, any mine rehabilitation plan that further reduces freshwater flows or introduces new hydrological risks must be scrutinized rigorously.

FOGL is an independent community group dedicated to protecting the Gippsland Lakes. We approach this submission with a culturally informed, science-based perspective, aligned with our mission to preserve the Lakes' ecological integrity for future generations. We note with concern that the Yallourn DMRP is **heavily caveated** – it contains broad disclaimers that its forward-looking statements are not guaranteed and may be based on limited data or assumptions (EnergyAustralia Yallourn, 2025, p.ii). Such caveats undermine confidence in the plan's credibility. Moreover, the plan appears to downplay reasonably foreseeable risks, presenting an optimistic outlook without adequately addressing plausible worst-case scenarios. Given the changed circumstances since Yallourn's last Environmental Effects Statement (EES) in 2001 – including the accelerating impacts of climate change and new insights from the Hazelwood mine closure process – FOGL submits that a fresh, comprehensive environmental assessment is warranted. Notably, the Hazelwood mine rehabilitation triggered the federal EPBC Act “water trigger” due to likely significant impacts on water resources, establishing a presumption that similar referrals will be required for Yallourn's closure.

Risks of Maintaining Status Quo in Environmental Flows

While proponents like Energy Australia and the Latrobe Valley Regional Rehabilitation Strategy (LVRRS) suggest that mine-rehabilitation water access would not *formally* reduce existing environmental entitlements, this narrowly framed position overlooks critical flow-ecology dynamics. In a system already carrying an ~129 GL/year environmental water deficit, extracting substantial volumes during winter–spring high-flow events can materially alter the frequency, magnitude, duration, and timing (FMDT) of freshes that sustain the Gippsland Lakes Ramsar site. Even without changing entitlement shares on paper, capturing event flows can:

- Dampen salinity-flushing pulses, allowing the estuarine salt wedge to persist further upstream and lengthen recovery times;



- Interrupt habitat renewal and connectivity, including floodplain wetting, wetland soil accretion, seedbank germination, and fish passage that depend on rising-limb cues;
- Reduce sediment and organic matter delivery, weakening primary productivity and food-web support across Sale Common, Dowd Morass, Heart Morass, and Lake Wellington; and
- Shift hydrograph shape (not just annual volume), eroding the ecological signals on which biota rely.

Such outcomes would be inconsistent with the objectives of the Central & Gippsland Region Sustainable Water Strategy (CGRSWS, 2022) to recover and protect environmental flows and with Australia’s Ramsar obligation to maintain the ecological character of listed wetlands. They also sit uncomfortably with Section 40 of the Water Act 1989 (Vic), which requires decision-makers to have regard to adverse environmental effects and the preservation of the Environmental Water Reserve. In short, “no reduction in entitlements” is not a sufficient test: access must be conditioned so that event-scale ecological functions—including mandated freshes, rising-limb embargoes, and minimum annual fresh counts—are delivered before any pumping window opens, and any approved take demonstrably avoids further degrading an already flow-stressed system.

Section 40 Obligations in a Flow-Deficit System

Under **Section 40 of the Water Act 1989 (Vic)**, the Minister must “*have regard to any adverse effect on the environment*” and “*the need to preserve the Environmental Water Reserve*” before issuing a new entitlement. This obligation carries particular weight in the Latrobe system already facing heightened climate risks, where an established 129 GL/year environmental water deficit, compounded by climate change, already places Ramsar-listed wetlands and dependent species at high risk. In such a context, even small additional allocations exacerbate an existing shortfall, further degrading ecological character and undermining the Environmental Water Reserve’s protective function.

Accordingly, section 40 requires a precautionary approach: no new mine-related entitlements can be consistent with the Act unless proponents demonstrate—through robust hydrological and ecological evidence—that they will not worsen the current deficit or prejudice the recovery of environmental flows. To do otherwise would be to sanction a licence in the knowledge that the statutory tests of environmental protection and water preservation cannot be met.



1.0 Structural and geotechnical vulnerabilities of the Morwell River Diversion under the DMRP

1.1 MRD Design and Materials:

The Morwell River Diversion (MRD) was constructed to reroute the Morwell River around the Yallourn open-cut, using an embankment-and-channel system largely formed from mine overburden and locally sourced clays—materials that, when sodic or dispersive, are intrinsically prone to erosion, piping and loss of strength under saturation (Sherard et al., 1976; Wan & Fell, 2004). While more resilient options—such as an Eastern Diversion Channel set further from the mine footprint to also bypass the (largely rehabilitated) Hazelwood site—were canvassed, the DMRP indicates the proponent selected a lower-cost configuration in the existing corridor, reportedly avoiding ~A\$80 million relative to more robust alternatives. Notwithstanding earlier promotion of the

Aerial view of the damaged coal mine at the Yallourn Power Plant in eastern Victoria. (ABC-TV

MRD as an “award-winning feat of engineering,” the diversion failed catastrophically in June 2012, inundating the pit and curtailing generation; repairs took nearly two years and cost ~A\$150 million—almost twice the capital “saving” (ABC News, 2014; Environmental Justice Australia, 2021).

In life-cycle terms, this is a textbook false economy for high-consequence hydraulic infrastructure: short-term capex minimisation can externalise failure risks and ultimately cost more once breach, emergency works and prolonged outages are accounted for. Against this backdrop, any proposal that tolerates overtopping or relies on unarmoured overflow paths across dispersive earthen levees is inconsistent with established dam/levee performance science and should be replaced with full-containment conveyance (with conservative freeboard) and, where necessary, engineered and armoured spillways (Hanson et al., 2005; Briaud et al., 2008).

The MRD has already proven vulnerable to extreme weather events well within the range of historical variability. In fact, prior to its failure the MRD was promoted as able to withstand up to a 1-in-10,000-year flood, yet the 2012 flood (while serious) was nowhere near that magnitude (EJA, 2021). The divergence between model predictions and real-world performance underscores the uncertainty in the new structure’s long-term stability. Unfortunately, past lessons appear not to have been learnt, with the lowest-cost ‘earthen levees’ design option most favoured by the DMRP.



Aerial view of the damaged coal mine at the Yallourn Power Plant in eastern Victoria. (ABC-TV)

1.2 DMRP Proposals Affecting MRD Integrity:

Rather than reinforcing the diversion, the DMRP proposes modifications that could increase the risk of failure. FOGL is alarmed by plans to lower the MRD levees and install “side-cast” spillway weirs along the diversion route (EnergyAustralia, 2025, sec. 4). The intent is ostensibly to allow controlled overflow into mine voids during high flows. However, overtopping cohesive earthen levees—especially where dispersive clays are present—presents well documented risks to structural integrity and stability, as outlined in detail below.

1.2.1 Overtopping is an unacceptable failure mode for earthen levees in dispersive clays

Designing the MRD to “spill safely” by lowering crests and adding side-cast weirs normalises a foreseeable and preventable failure mode. Once freeboard is exceeded, flow over a cohesive earthen levee rapidly erodes the landward slope: hydraulic shear surpasses the soil’s critical resistance, headcuts form and migrate, and breach growth can proceed from minutes to hours (Hanson, Cook, & Hunt, 2005; Briaud, 2008; Briaud, Chen, Govindasamy, & Storesund, 2008; Wei, Zevenbergen, Vrijling, & Ma, 2016). Where dispersive clays are present—as is common in Latrobe Valley overburden—low-salinity water destabilises the clay fabric, sharply lowers erosion thresholds, and accelerates



both surface scour and internal erosion (piping), a vulnerability readily identified by standard pinhole/crumb tests (Sherard, Dunnigan, Decker, & Steele, 1976; Wan & Fell, 2004). In such materials, “controlled overtopping” is not risk reduction; it is risk creation.

From a policy perspective, this matters. A levee breach at the MRD is not a routine maintenance event—it is a high-consequence incident that can divert freshwater away from the Latrobe and Gippsland Lakes, trigger costly emergency works, and undermine public confidence in rehabilitation governance. The prudent standard is clear: design for non-overtopping conveyance with conservative freeboard; where exceedance routing is unavoidable, convey flows only via engineered, armoured spillways keyed into non-erodible foundations with appropriate filter transitions—not across unprotected earthen crests (Hanson et al., 2005; Briaud, 2008; Wei et al., 2016). In short, the DMRP should eliminate overtopping at the MRD and adopt breach-averse design as a matter of public safety and environmental duty. Put simply, earthen levees built from dispersive clays should be designed to **avoid** overtopping, not to accommodate it.

1.2.2 “Side-cast” weirs would increase breach likelihood, not reduce it

Installing low, side-cast weirs along the diversion to permit overflow into the pit will concentrate overtopping flows and accelerate headcut migration. Laboratory and field evidence after Hurricane Katrina, as well as controlled EFA flume work, show that localized overtopping points trigger rapid erosion and mass wasting on the landward faces of levees (Briaud et al., 2008; Hanson et al., 2005). Where soils are plastic and/or poorly compacted, critical shear thresholds are low and breach growth is fast, making “sacrificial overtopping” strategies unsafe unless the overflow is conveyed via engineered, **armoured spillways** designed to pass the design flood (not side-cast cuts through earthen embankments).

1.2.3 Conduit and foundation pathways: HDPE-plugging the historic conveyor tunnel is unlikely to be a durable seepage fix

Conduits and abandoned penetrations through or beneath embankments are known initiation points for concentrated leakage and piping. Event analyses of dam and levee incidents repeatedly identify conduit-associated internal erosion as a recurrent failure mechanism; durable remediation typically requires structural backfilling, graded filters/drains, and positive cut-offs or collars, not thin liners alone (Fell, Wan, Cyganiewicz, & Foster, 2003; Foster, Fell, & Spannagle, 2000; Lee, Ryu, Heo, Shim, & Lee, 2022). FOGL therefore questions the proposed liner-centric fix: liners can leave annular pathways and contact defects unaddressed, whereas pressure grouting plus engineered backfill/filter transitions directly eliminate preferential flow paths and restore filter compatibility—essential to suppress piping risk (Fell et al., 2003; Foster et



al., 2000; Lee et al., 2022). In short, a long-term fix should be designed to eliminate preferential flow paths and provide filter compatibility—not merely “plug” a void.

1.2.4 Saturation, pore-pressure rise and batter slumping under a filling pit lake

As the pit transitions to a lake, the groundwater table rebounds and rainfall infiltrates the batters, stripping away matric suction that currently contributes to shear strength. Even modest rises in pore pressure can drive a step-change reduction in effective stress, pushing factors of safety from marginal to failing—especially in stratified or weakly cemented overburden (Iverson, 2000; Lu & Godt, 2008). This is not a commissioning wrinkle; it is a predictable, high-consequence shift in the slope stability regime. Without transient, unsaturated seepage–stability modelling that couples staged lake filling, seasonal recharge, storm sequences, and groundwater rebound, the slumping risk envelope adjacent to the MRD remains under-characterised. Prudence dictates a full analysis (limit-equilibrium plus numerical) and a field program of piezometers and inclinometers tied to conservative trigger/action levels before any crest-lowering or overtopping concept proceeds (Iverson, 2000; Lu & Godt, 2008).

1.2.5 Structural geology matters: proximity to faults increases uncertainty

Faults and persistent discontinuities are first-order controls on open-cut slope performance. They create kinematic release planes (planar/wedge/topple), act as preferential seepage conduits that elevate pore pressures locally, and can daylight into batters as saturation rises—amplifying the likelihood of progressive failure (Stead & Wolter, 2015). In the Yallourn context, the presence of a local structure such as the Haunted Hills fault demands explicit mapping, hydrogeologic characterisation, and sensitivity testing. Absent a 3-D structural model integrated into slope and seepage analyses, placing critical flood-conveyance functions (e.g., an overtopping pathway) near structurally weakened batters imports avoidable instability and piping risk. The defensible standard is clear: build the MRD strategy around conservative setbacks from mapped structures, and verify with kinematic/limit-equilibrium and numerical modelling under saturated and flood-load cases (Stead & Wolter, 2015).

1.3 MRD Design implication: The lowest-cost “overtop into the pit” option preferred by the DMRP should be abandoned in favour of

- (i) full-containment flood conveyance along the MRD for its design AEP, and
- (ii) any required emergency spillways built as robust, armoured hydraulic structures tied into competent foundation, with independent geotechnical and soil-erodibility verification.

In practice, this requires:



- **Non-overtopping design standard:** Size the MRD to pass $\geq 1\%$ AEP without crest exceedance, test sensitivity to rarer events (e.g., 0.2% AEP), and maintain residual freeboard after allowance for wave run-up, settlement and hydraulic uncertainty (Hanson, Cook, & Hunt, 2005; Briaud, Chen, Govindasamy, & Storesund, 2008).
- **Armoured, engineered spillways only:** Where an emergency outlet is necessary, use RCC or concrete-lined chutes/rock chutes with geotextile underlays, properly keyed into non-erodible foundation and fitted with energy dissipation—never unprotected earthen crests or side-cast notches (Hanson et al., 2005; Briaud et al., 2008).
- **Erosion and piping controls:** Provide a continuous cutoff (low-permeability core or wall), chimney and blanket filters, and toe drains designed for filter compatibility to prevent backward erosion and piping; identify and treat dispersive soils (replacement or chemical treatment) only after pinhole/crumb and erosion-function testing confirms adequacy (Sherard, Dunnigan, Decker, & Steele, 1976; Wan & Fell, 2004).
- **Conduit remediation:** Treat the conveyor tunnel and any penetrations as high-risk seepage paths—pressure-grout voids, structurally backfill, and install filter diaphragms/collars; do not rely on liner-only fixes that can leave annular leakage pathways (Fell, Wan, Cyganiewicz, & Foster, 2003; Foster, Fell, & Spannagle, 2000; Lee, Ryu, Heo, Shim, & Lee, 2022).
- **Slope stability under lake filling:** Undertake coupled transient seepage–stability modelling (unsaturated to saturated) for staged filling, storm sequences and groundwater rebound; instrument with piezometers and inclinometers and adopt conservative trigger/action levels (Iverson, 2000; Lu & Godt, 2008).
- **Independent assurance and operations:** Require third-party peer review (soil mechanics, hydraulics), construction QA (compaction, material reactivity), a surveillance and maintenance plan, and an updated Emergency Action Plan tied to hydrometric triggers that prioritise downstream environmental flows before any pit takes.

These measures align the MRD with breach-averse practice and materially reduce the probability of rapid erosion and catastrophic failure while preserving essential freshwater delivery to the Latrobe and Gippsland Lakes

1.3.1 Public-interest and governance safeguard: Anything less risks the clear perception that the MRD is being engineered to fail—normalising breach and capturing unmetered river flows to fill the pit faster and cheaply. That outcome would amount to



de facto “river capture,” undermine confidence in rehabilitation governance, and cut across policy settings that require metered, licensed and priced water use with no adverse environmental impact (DELWP, 2020a; DELWP, 2022). To avoid regulatory arbitrage and protect Ramsar assets, approvals should mandate:

- **No-uncontrolled inflow covenants:** Physical separation and controls (gates/structures) such that any pit inflow is intentional, **metered**, and subject to entitlement/pricing.
- **Hard performance limits:** Zero diversion to pit below defined environmental-flow thresholds; cease-to-take in dry periods consistent with LVRRS/SWS principles (DELWP, 2020a; DELWP, 2022).

These measures align the MRD with breach-averse best practice and materially reduce the probability of **rapid erosion and catastrophic failure** while safeguarding essential freshwater delivery to the Latrobe and Gippsland Lakes (Hanson et al., 2005; Briaud et al., 2008; Sherard et al., 1976; Wan & Fell, 2004; Fell et al., 2003; Foster et al., 2000; Iverson, 2000; Lu & Godt, 2008).

1.4 MRD Performance Under a Pit Lake (Saturated) Scenario:

A central deficiency of the DMRP is the absence of a rigorous assessment of MRD integrity under adjacent, permanently saturated (“drowned”) conditions. Converting the pit to a terminal lake will raise the phreatic surface, remove matric suction, and impose sustained hydraulic heads across the MRD embankment and foundation—reducing shear strength and increasing deformation potential in stratified, weakly cemented, or dispersive overburden (Iverson, 2000; Lu & Godt, 2008). Australian practice expects these conditions to be addressed explicitly through staged geotechnical investigations and groundwater characterisation for dam-adjacent works (ANCOLD, *Guidelines for Geotechnical Investigations of Dams*, 2020)

1.4.1 Seepage and piping under saturated adjacency. A persistent lake level next to the MRD will establish long seepage paths through the embankment and its foundation. Without a demonstrated under-seepage cut-off, chimney/blanket filters, and toe drainage designed for filter compatibility, preferential flow paths can develop, initiating backward erosion and piping. Australian guidance is clear on the need for risk-informed design and management for such modes (ANCOLD, *Guidelines on Risk Assessment*, 2022; *Guidelines on Dam Safety Management*, 2003; *Guidelines on Consequence Categories*, 2012). Geotechnical investigation and design should be carried out to AS 1726:2017 (scope, subsurface model, groundwater regime) and use Australian soil dispersion/erodibility tests—e.g., AS 1289.3.8.1 Emerson Class—to identify and treat dispersive materials before service. (Standards Australia, 2017a, 2017b).



1.4.2 Wave and shoreline attack. As the lake rises, wave run-up, drawdown and overtopping discharges will act directly on MRD margins that bound the water body. Rock armour (riprap) design, sizing, layer thickness, and toe details should be to AS 4997:2005 (Maritime Structures) using appropriate stability formulae for the site-specific fetch, wind climate and water-level range, and armour quality should meet AS 2758.4:2017 where gabions or wire mattresses are specified; geotextile filters/separators should meet AS 3706 testing requirements. (Standards Australia, 2005, 2017c, 2012). Because lake level will rise in stages, the design must include a program for staged raising of armour and crest protection to maintain performance throughout filling, not just at final level (Standards Australia, 2005).

1.4.3 Hydrology and design events. Hydraulic sizing and freeboard should be based on Australian Rainfall and Runoff 2019 (ARR 2019) with appropriate AEPs, non-stationarity checks, and joint probability where relevant; dam/levee-safety checks should align with ANCOLD's acceptable flood capacity / consequence category guidance to ensure consistency with Australian tolerability criteria (Geoscience Australia, 2019; ANCOLD, 2000; ANCOLD, 2012).

1.4.4 Policy implication. In the absence of coupled, ARR-consistent hydrology and ANCOLD-aligned seepage–stability modelling, instrumented by a field program (piezometers, inclinometers) and governed by conservative trigger–action levels, the credible long-term trajectory under lake conditions is progressive slumping and internal erosion of MRD sections—ultimately culminating in partial or complete diversion failure. Approval should therefore require:

- (i) a saturated-adjacency design package (3-D/2-D seepage, staged filling envelopes, unsaturated-to-saturated strength transitions, dispersion/erodibility verification to AS 1289);
- (ii) a shoreline protection design to AS 4997 with provisions for staged raising and materials to AS 2758.4 and AS 3706; and
- (iii) independent review against ANCOLD risk, consequence and dam-safety guidance, with site investigations to AS 1726 and flood estimation to ARR 2019.

1.5 Concluding Remarks on the MRD design proposal

FOGL's assessment is that the MRD's long-term structural reliability is unacceptably uncertain under the DMRP's current "overtop-into-the-pit" concept. The consequence pathway—levee erosion, breach, and de facto river capture into the pit—would have system-scale impacts on Latrobe flows, the Lower Latrobe wetlands, and the Gippsland Lakes. Yet this foreseeable risk is minimally treated in the plan's risk register and not analysed to a standard commensurate with the potential consequences.



FOGL therefore recommends a breach-averse redesign built on established Australian practice:

- **Non-overtopping conveyance** as the design default, with verified freeboard and capacity to safely pass $\geq 1\%$ AEP (1-in-100) flood without crest exceedance, sized using ARR 2019 and consequence-appropriate safety checks consistent with ANCOLD guidance.
- **Strengthening rather than lowering**: raise or reinforce levees and foundations where required; identify and treat dispersive/erodible materials; provide cut-offs, chimney/blanket filters and toe drains to maintain filter compatibility and suppress piping.
- Any hydrologic connection between river and pit to occur only via a **controlled, gated and armoured structure** (not unprotected earthen weirs), keyed into competent foundation and subject to independent geotechnical/soil-erodibility verification and operational rules that prioritise downstream environmental flows.
- **Independent peer review**, construction QA, and instrumented surveillance (piezometers, inclinometers) with conservative trigger–action response levels embedded in an updated Emergency Action Plan.

Anything less will foster the perception—and the very real risk—that the MRD is being engineered to fail, enabling unmetered river capture to fill the pit faster and cheaply. That outcome would permanently alter regional hydrology, undermine public confidence in rehabilitation governance, and conflict with state and national policy settings for licensed, metered, and environmentally sustainable water use.

2.0 Risks of MRD Failure to Wetlands and the Gippsland Lakes

If the MRD were to fail or if the current DMRP strategy effectively diverts a large portion of Morwell River flow into the mine void, the **impacts on downstream ecosystems would be severe**. The Morwell River is a tributary of the Latrobe River, joining just upstream of the Lower Latrobe Wetlands (Heart and Dowd Morass) and Lake Wellington, the westernmost lake of the Gippsland Lakes Ramsar Site. The diversion collapse scenario is not hypothetical – it occurred in 2012 and seems likely to occur again under the proposed conditions. We outline here the expected consequences for flow regimes, habitat connectivity, salinity, and overall ecological character.



2.1 Loss of Freshwater Inflows:

If the Morwell River is captured by the pit—whether through MRD failure or intentional redirection—a substantial volume that would otherwise reach the Latrobe River and the Lower Latrobe Wetlands would be impounded in a terminal lake. FOGL’s catchment analysis indicates mean annual runoff in the Morwell of approximately 120–180 GL/year (dry–wet years), most of which presently contributes to Latrobe flows. Under the DMRP’s proposed “overflow weir” arrangement, baseflows and even moderate events could be intercepted—particularly during lake filling—because whenever lake level sits below river stage, spills will preferentially enter the pit.

Critically, without securing the MRD’s long-term integrity, this de facto river capture would likely forego in the order of 120–180 GL/year of freshwater to the Latrobe—exceeding any plausible licensed pumping scenario for pit filling. For context, AGL’s current Loy Yang application seeks a maximum 35.8 GL/year, and DEECA has contemplated a combined cap of ~63 GL/year for Yallourn plus Loy Yang (Resources Victoria (2024). At a mid-range Morwell runoff of ~158 GL/year, an unsecured MRD would remove **~4.4× the volume** sought by AGL alone and **~2.5× the mooted combined cap**—unmetered and outside entitlement frameworks.

Downstream, the implication is straightforward: persistent interception of Morwell flows would further depress Latrobe discharges beyond existing reductions from storages and consumptive use (DELWP, 2020a; DELWP, 2022). Reduced floods lengthen dry phases, driving loss of freshwater/brackish plant communities and constraining feeding and breeding opportunities for waterbirds, frogs and fish (Hale et al., 2020). Hydrological–ecological assessments for the system are explicit that decreased water availability presents “multiple and interconnected threats” to river and wetland values and, under a drying climate, could drive components of the system beyond recovery thresholds (Hale et al., 2020). In short, the Gippsland Lakes and fringing wetlands require more reliable freshwater, not less; proposals that divert water away are counter to restoration objectives and expose the Ramsar site to elevated risk (Hale et al., 2020; DELWP, 2022).

The stakes are heightened by the Ramsar status of Sale Common, Heart Morass and Dowd Morass, which are protected for their freshwater-dependent values and biodiversity. Sale Common is the last remaining true freshwater wetland in the Lakes complex, following historical salinisation (Hale et al., 2020). Under the Ramsar Convention, material changes to water regimes (e.g., frequency/volume of inflows) that alter ecological character are a reportable matter and may engage national obligations (Ramsar Convention Secretariat, 2016). The Ecological Effects Assessment explicitly notes that predicted flow reductions associated with pit filling could change the ecological character of the Gippsland Lakes Ramsar site, with national and international implications (Hale et al., 2020). On this basis, a major reduction in



Morwell/Latrobe flows is likely to constitute a significant impact on a Ramsar wetland, warranting federal oversight; maintaining flow connectivity is therefore not merely preferable but obligatory under established policy and international commitments (DELWP, 2022; Ramsar Convention Secretariat, 2016).

To protect downstream ecological processes and account for the Latrobe's chronic water deficits (circa 129 GL p.a.), FOGL submits that all flows up to at least the 5-year ARI ($\approx 20\%$ AEP) should pass unimpeded to the Latrobe; the DMRP provides no such assurance.

2.2 Degraded Habitat Connectivity and Food Webs: Biotic and energy

connectivity. The significance of the Morwell River lies not only in its discharge volume but also in the **quality, timing, and biogeochemical composition** of the materials it transports. The delivery of freshwater, sediments, nutrients, and organic matter is fundamental to maintaining downstream ecological processes, supporting wetland productivity, and regulating estuarine function. For instance, the forested headwaters of the Morwell River supply coarse particulate organic matter (CPOM)—leaf litter, woody debris—and entrained biota that subsidise microbial and invertebrate production, structure habitat, and cue fish movement and spawning (Vannote, Minshall, Cummins, Sedell, & Cushing, 1980; Webster & Meyer, 1997). Upstream impoundments on the Latrobe trap much of the large organic material, leaving the mainstem “starved” of structural wood and CPOM and disproportionately reliant on dissolved and fine particulate organic matter (Boon, Cook, Woodland, & Aldridge, 2015; Hale, Boon, Lloyd, Vietz, & Jempson, 2020). The Morwell—draining largely forested terrain—currently replenishes this deficit by delivering CPOM, invertebrates, and fish to the Latrobe. If the Morwell is terminated in a pit lake, that longitudinal connectivity of biota and energy is severed: fish, macroinvertebrates, and semi-aquatic fauna (e.g., platypus) moving out of the Morwell would confront a dead-end basin rather than a connected river corridor; the receiving lake, as argued in Section 4, is unlikely to sustain a complex, river-like food web (Paerl & Otten, 2013; Seymour, 2025). The net effect is a further depletion of biological inputs to the Latrobe, undermining recovery trajectories for habitat complexity, trophic support, and recruitment processes (Boon et al., 2015; Hale et al., 2020).

Salinity flushing and estuarine function: Periodic freshwater pulses from the Latrobe—augmented by Morwell contributions—are also essential to flush salts, push back the estuarine salt wedge, and reset water quality in Lake Wellington and the Lower Latrobe Wetlands (Boon et al., 2015; Hale et al., 2020). Reduced inflows caused by pit-lake interception would lengthen saline residence times, thereby elevating salinity in fringing



wetlands such as Dowd Morass and exacerbating stress on freshwater/brackish flora and fauna (Hale et al., 2020; DELWP, 2022). The Ecological Effects Assessment identifies Lake Wellington and the Lower Latrobe Wetlands as highly sensitive to even modest flow reductions; harvesting river water for pit filling is forecast to increase salinity and shift communities toward salt-tolerant, less diverse states (Hale et al., 2020). Expected outcomes include encroachment of saltmarsh at the expense of freshwater/brackish marsh, loss of saltwater-intolerant species such as swamp paperbark (*Melaleuca ericifolia*), and heightened risk of algal blooms under warmer, more stagnant, and more saline conditions (Boon et al., 2015; Hale et al., 2020; Paerl & Otten, 2013). While saltmarsh has clear ecological and blue-carbon value (see Section 3), a wholesale shift from a brackish/freshwater mosaic to a more saline regime reduces habitat diversity and overall biodiversity, contrary to the system's restoration goals (DELWP, 2022; Hale et al., 2020).

Management implication. Maintaining through-flows from the Morwell into the Latrobe—particularly for baseflows and moderate events—preserves both material subsidies (CPOM, organisms) and hydrologic functions (salinity flushing, nursery habitat formation). Any scheme that intercepts these flows at the pit margin compromises food webs and erodes the ecological character of the Ramsar-listed wetlands downstream (Hale et al., 2020; DELWP, 2022).

2.3 Altered Salinity Regimes: The Gippsland Lakes are an estuarine–lagoon complex connected to the sea at Lakes Entrance, with a natural longitudinal gradient from comparatively fresh conditions in Lake Wellington to more marine waters in Lake Victoria and Lake King (Boon, Cook, Woodland, & Aldridge, 2015; Hale, Boon, Lloyd, Vietz, & Jempson, 2020). Freshwater inflows from the Latrobe–Thomson–Macalister system supply up to 46% of total freshwater inflows to the Gippsland Lakes in dryer years (Hale et al., 2020). The Latrobe system is the primary mechanism maintaining brackish conditions in Lake Wellington and the Lower Latrobe Wetlands by pushing back the salt wedge and providing periodic flushing (Hale et al., 2020; Department of Environment, Land, Water and Planning [DELWP], 2022).

FOGL is therefore concerned that diverting Morwell River water would raise salinity in these upstream components by reducing the frequency and magnitude of flushing events. Hydrological–ecological assessments for the Latrobe–Wellington system indicate that lower river inflows lengthen saline intrusion, diminishing the Lakes' capacity to reset salinity and water quality after marine incursions (Hale et al., 2020; DELWP, 2022). Dowd Morass already experiences salinity build-up with associated dieback of fringing wetland vegetation during extended intervals between floods; any further reduction in inflows would amplify these stressors (Hale et al., 2020). The foreseeable consequences of sustained higher salinity include shifts in aquatic plant communities (loss of submerged freshwater macrophytes and expansion of salt-



tolerant taxa), increased physiological stress on freshwater fish and amphibians that depend on low-salinity habitats or breeding cues, and a higher likelihood of toxic algal blooms under warmer, more stagnant conditions (Boon et al., 2015; Hale et al., 2020; Paerl & Otten, 2013).

The ecological character of the Gippsland Lakes Ramsar Site is expressly defined by a mosaic of fresh, brackish and saline habitats and their dependent species (Hale et al., 2020; Ramsar Convention Secretariat, 2016). If reduced inflows allow Lake Wellington to become more marine, this would be a profound—and likely adverse—shift relative to the site’s listed Ramsar values, many of which (e.g., freshwater/brackish marshes supporting migratory waterbirds and amphibians) rely on regular freshening. Changes of this kind risk alteration of ecological character, with national and international reporting and compliance implications under the Ramsar Convention (Hale et al., 2020; Ramsar Convention Secretariat, 2016).

From a regulatory standpoint, measures that materially diminish river inflows to Ramsar-listed wetlands can engage the EPBC Act in two ways:

- (1) as a potential significant impact on a Ramsar wetland (Matters of National Environmental Significance), and
- (2) where relevant, via the “water trigger” for actions involving a large coal mining development that are likely to significantly impact a water resource (Environment Protection and Biodiversity Conservation Act 1999, ss 24D–24E) (Department of Climate Change, Energy, the Environment and Water [DCCEEW], 2023).

Recent decisions confirm that coal-mine rehabilitation proposals can be treated as controlled actions on Ramsar and water-resource grounds, with assessment streamlined through the accredited Victorian EES where applicable (Hale et al., 2020; Resources Victoria, 2024). Accordingly, any rehabilitation scheme that relies on intercepting Morwell flows should be referred for federal assessment (EPBC Act) in addition to state approvals.

Victorian policy settings also emphasise no net diminishment of existing entitlements and environmental values when considering water access for mine rehabilitation. The Latrobe Valley Regional Rehabilitation Strategy (LVRSS) Amendment (October 2023) clarifies that conditions on any future access to Latrobe River system water should ensure existing water users and values are not diminished, and signals that manufactured water may be required in dry-climate scenarios rather than relying on high-reliability river water (DELWP, 2022; Resources Victoria, 2024). These settings align with the Lakes’ restoration objectives and the Traditional Owner values recognized in regional water strategies (DELWP, 2022).



2.3.1 Policy implication. In this context, maintaining flow connectivity and flushing to Lake Wellington and the Lower Latrobe Wetlands is not simply ecologically preferable; it is required to uphold Ramsar commitments and contemporary water-policy principles. Proposals that divert Morwell flows into a pit lake cut across those principles, increase salinity risks, and elevate the likelihood of MNES impacts—warranting EPBC referral and stringent conditions to protect downstream ecological character (Hale et al., 2020; DELWP, 2022; Ramsar Convention Secretariat, 2016).

3.0 Threats to Blue Carbon and EPBC Act Implications

3.1 Significance of blue-carbon sequestration in the Gippsland Lakes

The Gippsland Lakes and their fringing wetlands are not only biodiversity assets; they are also material blue-carbon ecosystems, storing and sequestering carbon in saltmarsh, seagrass meadows, reed beds and periodically inundated swamp forest. In these systems, primary production is buried in anoxic sediments, locking away carbon over decades to millennia (Fourqurean et al., 2012; Kelleway et al., 2019; Macreadie et al., 2017). Regional research highlights the Lakes' strong sequestration potential; the Deakin University Blue Carbon Lab reports indicative Victorian saltmarsh sequestration rates on the order of $\sim 2.4 \text{ t CO}_2 \text{ ha}^{-1} \text{ yr}^{-1}$ (Blue Carbon Lab, 2023; Costa et al., 2022). The policy relevance is direct: maintaining freshwater inflows that sustain wetland health supports not only biodiversity and Ramsar values (Hale, Boon, Lloyd, Vietz, & Jempson, 2020), but also state and national climate-mitigation objectives through preserved and enhanced blue-carbon services.

Conversely, sustained salinisation or drying arising from reduced river inflows can degrade wetland vegetation, lower ongoing sequestration, and mobilise legacy soil carbon via oxidation—converting long-standing sinks into net sources (Pendleton et al., 2012; Kelleway et al., 2019). In the Gippsland context, this risk is acute for fringing marshes and brackish/fresh complexes such as Heart Morass and Dowd Morass, whose condition is tightly coupled to flood frequency and duration (Hale et al., 2020).

3.2 Indicative valuation of blue-carbon services (order-of-magnitude)

To convey scale, FOGL applies a conservative saltmarsh sequestration rate of $2.42 \text{ t CO}_2 \text{ ha}^{-1} \text{ yr}^{-1}$ (Blue Carbon Lab, 2023; Costa et al., 2022) across $\sim 17,655 \text{ ha}$ of fringing wetlands around the Gippsland Lakes (FOGL analysis), and a reference carbon price of $\text{A\$}47 \text{ t}^{-1} \text{ CO}_2\text{-e}$ (Clean Energy Regulator, 2022). This yields:

- Annual sequestration value: $2.42 \text{ t} \times \text{A\$}47 \approx \text{A\$}113.7 \text{ ha}^{-1} \text{ yr}^{-1}$; across $17,655 \text{ ha} \approx \text{A\$}2.01 \text{ million yr}^{-1}$.



- Water-value lens: Using a conservative inflow shortfall of 129 GL yr^{-1} , the implied blue-carbon premium to preserve sequestration is $\sim\text{A\$}15.6 \text{ ML}^{-1}$ ($\text{A\$}2.01 \text{ m} \div 129,000 \text{ ML}$).
- Avoided-emissions lens (illustrative): If degradation released even 50% of the sequestration benefit as foregone/avoided emissions, this adds $\sim\text{A\$}7.8 \text{ ML}^{-1}$, giving a combined $\sim\text{A\$}23.3 \text{ ML}^{-1}$ carbon-related premium to recognise in water-allocation and pricing decisions for mine rehabilitation.

These figures are illustrative, not exhaustive: they exclude seagrass and swamp-forest contributions, do not capitalise future flows (no discounting), and assume uniform rates across habitats. They nonetheless demonstrate that diverting freshwater inflows carries a measurable climate cost in addition to ecological risk.

3.3 Policy alignment and EPBC Act considerations

Australia's policy architecture increasingly recognises blue-carbon value—through national methods for coastal wetland crediting and active restoration pilots (Blue Carbon Lab, 2023; Clean Energy Regulator, 2022). Approving a rehabilitation scheme that undercuts these sinks by capturing river flows into a pit lake would be inconsistent with that policy trajectory and with the Latrobe Valley Regional Rehabilitation Strategy principle that any water for rehabilitation must not negatively impact environmental values (Hale et al., 2020; Department of Environment, Land, Water and Planning [DELWP], 2022).

In regulatory terms, actions that materially diminish inflows to Ramsar-listed wetlands or significantly affect a water resource associated with coal-mine operations should be referred under the EPBC Act—both as a potential significant impact on a Ramsar wetland (MNES) and, where applicable, under the water trigger for large coal mining developments (Environment Protection and Biodiversity Conservation Act 1999; see also DCCEEW guidance). On climate grounds alone, the social cost of foregone sequestration and avoided emissions should be factored into decision-making; on ecological grounds, maintaining freshwater connectivity is pivotal to preserving the Gippsland Lakes' blue-carbon asset base (Hale et al., 2020; DELWP, 2022; Kelleway et al., 2019).

3.4 EPBC Act “Water Trigger” and Obligations:

The EPBC Act (1999) has, since 2013, treated impacts on water resources from large coal mining developments as a *Matter of National Environmental Significance (MNES)*—commonly known as the “water trigger.” In practice this means that any action involving a large coal mining development that has, will have, or is likely to have a significant impact on a water resource must be referred to the Commonwealth Environment



Minister for assessment and approval (EPBC ss. 24D–24E, s.68). The Australian Government’s policy and guidance make this explicit (DCCEEW, 2023; DCCEEW, 2022).

3.4.1 Application to Yallourn rehabilitation: The creation and long-term operation of a full pit lake at Yallourn, supported by diversion or capture of surface water flows and changes to local groundwater regimes, is likely to be captured by the water trigger because it is integral to the rehabilitation of a large coal mining development and poses foreseeable, material impacts on downstream water resources (the Latrobe–Thomson–Macalister system and the Lower Latrobe Wetlands). Recent precedent underlines this: in 2023 the Commonwealth determined the Hazelwood Mine Rehabilitation Project to be a *controlled action* with controlling provisions that included “water resources” (EPBC ss. 24D & 24E), Ramsar wetlands, and threatened/migratory species, requiring assessment (DCCEEW, 2023, Statement of Reasons, EPBC 2022/09239).

3.4.2 Victorian policy expectation: The State’s Latrobe Valley Regional Rehabilitation Strategy – Amendment (2024) notes that the Hazelwood experience “creates a presumption that referrals under the EE Act and EPBC Act are likely to be required for the remaining mines” in advance of DMRP approval (Resources Victoria, 2024, p. 21). FOGL therefore considers EPBC referral by EnergyAustralia to be necessary for the Yallourn DMRP.

3.4.3 What constitutes a “significant” impact in this context?

Commonwealth guidance (Significant Impact Guidelines 1.3) indicates that altering a river’s flow regime, volumes, timing or quality in ways that may degrade wetlands or dependent species is likely to be significant for the water trigger (DCCEEW, 2022). The Latrobe Valley Ecological Effects Assessment (Hale et al., 2020) concludes that reducing Latrobe inflows—whether by harvesting floods or new extractions to fill pit lakes—would have multiple, interconnected ecological impacts, including salinity increases and vegetation decline in Lake Wellington and the Lower Latrobe Wetlands, with potential change to the ecological character of the Gippsland Lakes Ramsar Site (Hale et al., 2020). These conclusions match the trigger’s significance tests. (Hale et al., 2020; DCCEEW, 2022).

3.4.4 MNES affected in the project area: The Gippsland Lakes Ramsar Site (including Sale Common, parts of Dowd Morass and Heart Morass) supports EPBC-listed species, notably the Australasian Bittern (*Botaurus poiciloptilus*, Endangered), and frog species of conservation concern. Recent monitoring confirms the presence of Green and Golden Bell Frog (*Litoria aurea*, Vulnerable) at Dowd Morass under freshened conditions (WGCMA, 2024–25 SWP). These wetlands are highly sensitive to flow reductions and salinity increases (Hale et al., 2020). Accordingly, diverting Morwell River water to a terminal pit lake would predictably reduce freshwater pulses, erode habitat



connectivity, and elevate salinity risk—all relevant to MNES assessments under both the Ramsar and water trigger provisions (Hale et al., 2020; VEWH, 2025).

3.4.5 Independent expert scrutiny: Under the water trigger framework, the Minister must seek the advice of the Independent Expert Scientific Committee (IESC) on Unconventional Gas Development and Large Coal Mining Development before deciding whether to approve a proposal (IESC, n.d.). This specialist, evidence-based review is precisely what is needed given the hydrological, geotechnical and water-quality uncertainties in the current DMRP.

3.4.6 State assessment and coordination. FOGL also recommends a new Victorian Environmental Effects Statement (EES) for Yallourn rehabilitation, coordinated with the EPBC process. Material changes since earlier approvals (including the 2001 and 2010 EES/Ministerial assessments for the Maryvale/Yallourn development pathway) warrant a full, transparent reassessment of alternatives, water sources, and MRD design, with enforceable conditions (DPCD, 2010; Bioregional Assessments, 2018).

3.4.7 Traditional Owner policy alignment: Finally, Commonwealth and State decision-makers should align assessments with “Water is Life: Traditional Owner Access to Water Roadmap” commitments and the LVRRS principles that environmental and cultural values must not be compromised by mine rehabilitation water needs (Resources Victoria, 2024). FOGL supports a joint EPBC–EES pathway that embeds Gunaikurnai participation at each stage.

3.4.8 FOGL’s position: Proceeding with the DMRP without an EPBC referral and assessment would risk non-compliance with the EPBC Act’s referral obligations (EPBC s.68) and would be inconsistent with current State policy signals. A Commonwealth assessment under the water trigger, informed by the IESC, together with a State EES, offers the rigorous, transparent pathway required to safeguard water resources, Ramsar values, and threatened species for the Gippsland Lakes and Lower Latrobe Wetlands. (DCCEEW, 2023; Resources Victoria, 2024; Hale et al., 2020).

In conclusion of this section, the DMRP poses clear risks to blue carbon values and invokes high-level legal and policy safeguards (EPBC Act, Ramsar Convention, state water strategy commitments). We expect DEECA and the proponent to fully comply with these safeguards, including undertaking proper referrals, rather than treating the rehabilitation as a foregone conclusion. “Water is life” is not just a slogan but a policy reality now – Traditional Owner voices and environmental science both insist that water must be allocated to Country and nature before indulgence to an expired mine (Victorian Government, 2022). The next sections examine further ecological consequences and socio-economic impacts that strengthen this argument.



4.0 Safeguards, conditions, and adaptive management for mine water use

If, after weighing the evidence, Government still intends to grant surface-water access for mine rehabilitation, the entitlement must be framed as a **strict, risk-managed permission** with clear limits, monitoring, enforcement, and review. Below, we consolidate the minimum conditions that should govern any Water Access Entitlement (WAE) or Bulk Entitlement (BE) issued for mine purposes.

4.1 Access timing and flow thresholds

To protect environmental flows and seasonal ecosystem functions, access should be confined to high-flow windows and structured fresh events.

Key issues:

- **High-flow only:**
 - Extraction permitted only when flows exceed the 80th–90th percentile (naturalised) at defined gauges.
 - Window limited to **winter–spring**, and only after environmental obligations are demonstrably met.
- **Seasonal fresh protection (FMDT):**
 - Guarantee the frequency, magnitude, duration, and timing of winter–spring freshes.
 - No pumping on the rising limb or early recession of specified fresh events (June–Nov).
 - Regulator sets a minimum annual fresh count using naturalised flow percentiles; event rules published in advance.
 - Compliance enforced via telemetry and annual audits; non-compliance triggers automatic curtailment the following year.

4.2 Cease-to-pump and environmental triggers

Extraction must stop when ecosystem condition indicators or baseflow targets are at risk.

Key issues:

- **Baseflow minima:** Immediate **cease-to-pump** when monthly EWR targets are not met at the licensee’s controlling gauge(s).



- **System-health triggers:** Automatic suspension if:
 - Lake Wellington salinity exceeds specified thresholds;
 - Wetland water level/vegetation/fish indicators fall below benchmarks;
 - Fish passage indicators signal obstruction.
- **MRD connectivity condition:** Loss of Morwell–Latrobe connectivity (\geq 5-year ARI) or MRD breach/decommissioning \Rightarrow immediate suspension pending independent review.

4.3 Volume caps and reliability

The entitlement must be small, adaptive, and the first to be curtailed in scarcity.

Key issues:

- **Strict annual cap:** Modest relative to Latrobe flows; zero unless environmental water recovery demonstrably improves system reliability.
- **Adaptive caps:** Ratchet down with climate indices and storage triggers; zero in drought/low-storage years.
- **Very-low reliability class:** Mine access is curtailed first under scarcity; conditions codified in the licence.

4.4 Flood-harvesting controls

Flood access must not erode the delivery of environmental freshes or create implicit priorities.

Key issues:

- **Eligibility:** Only after required freshes are delivered downstream and outside declared no-take windows.
- **Accounting:** All flood take metered and debited against the annual cap—no “bonus” volume.
- **Pricing:** Charged at a volumetric rate (never zero).
- **MRD dependency:** Suspended if MRD fails, as floodwaters would not reliably reach extraction points.

4.5 Offsets and “no net loss”

Any river water taken must be balanced so there is **no net harm** to environmental values.

Key issues:



- **Offset pathways:**
 - Purchase and retire equivalent entitlements for environmental delivery; or
 - Substitute with recycled/manufactured water to reduce river take.
- **Redirect savings:** Any retired power-station licences or efficiency gains are returned to the environment, not reallocated to mines.

4.6 Protecting Morwell River flows

The Morwell provides critical material and hydrologic subsidies to the Latrobe and wetlands.

Key issues:

- **Connectivity rule:** No take that reduces Morwell inflows to the Latrobe up to at least the 5-year ARI.
- **Licence review/voidance:** Automatic review—and potential voidance—if MRD status changes (breach, lowering, or decommissioning) that could enable river capture.

4.7 Metering, monitoring, and transparency

Public confidence requires real-time data, independent audits, and open reporting.

Key issues:

- **Telemetry:** Certified real-time meters at all extraction points; live data feed to the regulator and a public dashboard.
- **Continuous monitoring:**
 - Salinity in Lake Wellington;
 - Wetland water levels/vegetation/fish indicators;
 - Flow at critical gauges.
- **Audits:** Annual independent audits with public release; non-compliance tied to penalties and curtailment.

4.8 No adverse impact on existing users

Entitlements must not diminish reliability for environmental, urban, or irrigation holders.

Key issues

- **Non-deterioration test:** Licence must not reduce the reliability of existing entitlements or environmental water.



- **Modelling burden:** Proponent provides **independently reviewed** hydrological modelling showing no downgrade under climate stressors and MRD scenarios.

4.9 Water quality and rehabilitation duties

Mine operations must not externalise treatment or legacy risks to the public.

Key issues:

- **Discharge standards:** Enforceable water-quality limits for any future releases (e.g., pit-lake overflows).
- **Mandatory treatment:** Acidic/contaminated mine water must be treated to meet standards before any release or reuse.

4.10 Sunset clauses and review

Entitlements should be explicitly temporary and performance-tested.

Key issues:

- **Time-limited:** Licence expires after the initial fill or a fixed term (e.g., five years post-closure), whichever is sooner.
- **Mandatory review:** ~5-year statutory review to tighten, suspend, or revoke if adverse impacts are observed.

4.11 No compensation for curtailment

Environmental protection takes precedence over licensee returns.

Key issues:

- **Licence condition:** No financial compensation if access is curtailed/suspended to protect environmental or third-party users.
- **Risk allocation:** Curtailment risk is borne entirely by the licence holder.

4.12 Adaptive management

Conditions must evolve with evidence, but the precautionary principle applies.

Key issues:

- **Adjustable settings:** Ability to tighten thresholds, triggers, and volumes based on monitoring and audit results.
- **Precautionary bias:** Conditions may be relaxed only where strong evidence shows no material harm.



Conclusion. Even with strict design, taking water has impacts. The conditions above aim to minimise and tightly manage those impacts, place risk and accountability on the user—not the public or the environment—and operationalise a no-net-harm approach. Given the sensitivity of the Latrobe–Gippsland Lakes system and contemporary water scarcity, any mine water entitlement should be the most condition-laden and environmentally constrained licence issued in Victoria—setting a benchmark for ecological sustainability, if extraction is to occur at all.

5.0 Consequences of Terminal Pit Lake Formation

A core premise of the Yallourn DMRP is to convert the open-cut mine into a large **terminal pit lake**. FOGL has serious reservations about this end land use from a water quality and ecological standpoint. The DMRP portrays the future lake as a “new asset” for the community, potentially with recreation and habitat values. However, experience from other pit lakes and expert analysis suggest the outcome is more likely to be a **polluted, stratified water body with minimal ecological value**. We highlight key concerns: persistent poor water quality (anoxia, acidity, and contaminants), eutrophication risk, turbidity, and the general unsuitability of pit lakes as aquatic ecosystems.

5.1 Stratification and Anoxia (and why a large pit lake is a long-term water-quality liability):

Deep, steep-sided pit lakes almost invariably thermally stratify: a warm, oxygenated epilimnion overlies a colder, denser hypolimnion, separated by a persistent metalimnion that inhibits vertical mixing. In such settings, the lower waters progressively lose oxygen and can remain permanently anoxic (meromictic), especially where the depth/area ratio is high and wind-mixing is weak (Boehrer & Schultze, 2008; Imberger, 2001). Australian pit-lake studies—including in the Collie Basin—report stable stratification, poor deep-water oxygenation and challenging geochemistry that persists without sustained intervention (Lund, 2015; McCullough et al., 2010). In short, the physical template of a large, deep Latrobe Valley pit lake makes an anoxic hypolimnion not an outlier but the expected baseline condition. (Boehrer & Schultze, 2008; Imberger, 2001; Lund, 2015; McCullough et al., 2010.)

Once hypolimnetic anoxia sets in, redox-sensitive reactions dominate: microbes switch from oxygen to alternative electron acceptors (e.g., sulfate and ferric iron), driving strongly reducing conditions that (i) mobilise trace metals from sediments and pit walls, and (ii) generate sulfide and alkalinity in the lower water column. In coal-mine contexts where overburden contains reduced sulfur (e.g., pyrite) and trace metals, these processes can sustain problematic chemistries for decades without engineered mixing



or treatment (Akcil & Koldas, 2006; Johnson & Hallberg, 2005). Critically, sulfate-reducing bacteria (SRB) also create conditions conducive to mercury methylation—the conversion of inorganic Hg to methylmercury (MeHg)—at redox interfaces in anoxic sediments and waters, amplifying ecotoxic risk even when total Hg is modest (Compeau & Bartha, 1985; Gilmour et al., 1992; recent syntheses: Li et al., 2022). These dynamics are well documented in stratified lakes and reservoirs and are directly relevant to a deep Latrobe pit lake. (Akcil & Koldas, 2006; Johnson & Hallberg, 2005; Compeau & Bartha, 1985; Gilmour et al., 1992; Li et al., 2022.)

The water-quality consequences are predictable. Under anoxia, dissolved metals (e.g., Fe, Mn and associated trace metals such as Ni and Hg) can be released from sediments; hydrogen sulfide (H₂S) accumulates in bottom waters; and methane (CH₄) produced by organic matter decay builds up below the thermocline, venting episodically during turnover or seiching (Zhang et al., 2014; Kurucz et al., 2021). H₂S creates safety/odour hazards, while CH₄ is a potent greenhouse gas that undermines any claimed “amenity” value (and can be significant in stratified systems under warming scenarios). (Zhang et al., 2014; Kurucz et al., 2021.)

FOGL is also concerned about cumulative contaminant loading. The Latrobe Valley has a documented mercury emission legacy from brown-coal power stations, with modelling and sediment studies indicating elevated regional Hg compared with other coal regions (Emmerson et al., 2015; Schneider et al., 2021). Regional assessments for the Gippsland Lakes have repeatedly flagged mercury (and other metals) as priority contaminants for targeted investigation—particularly in Lake Wellington and the Lower Latrobe Wetlands near the Morwell/Latrobe confluence (CSIRO, 2016). Local media reporting of EPA material has also highlighted guideline exceedances for metals in Latrobe catchment streams (Latrobe Valley Express, 2013). A large terminal pit lake that intercepts and stores Morwell and mine-affected waters risks becoming a long-term sink and secondary source of bioavailable metals and MeHg to downstream environments via seepage, overtopping, or emergency releases. (Emmerson et al., 2015; Schneider et al., 2021; CSIRO, 2016; Latrobe Valley Express, 2013.)

Against this backdrop, the DMRP’s suggestion that periodic lime dosing could offset acidity and metal solubility is not credible at lake scale. The peer-reviewed AMD literature is clear: while alkaline dosing can correct pH in flow-through systems, whole-of-lake neutralisation in deep, stratified, low-mixing basins is operationally intensive, continuous, and expensive, and it does not address redox-driven processes (e.g., MeHg formation, deep H₂S generation) that are decoupled from bulk pH (Johnson & Hallberg, 2005; Akcil & Koldas, 2006). Effective long-term control typically requires source control, engineered destratification/mixing, and/or geochemical closures designed and tested through coupled hydrodynamic–geochemical models (e.g., PITLAKQ/CE-QUAL-W2 with PHREEQC), informed by robust kinetics and boundary conditions (Herrell,



2022; Hydrocomputing, n.d.; MBS Environmental, 2012). The DMRP provides no such defensible, coupled modelling, leaving decision-makers without a transparent forecast of pH, alkalinity, sulfide, dissolved metals, MeHg risk, and gas production over decadal horizons. (Johnson & Hallberg, 2005; Akcil & Koldas, 2006; Herrell, 2022; Hydrocomputing, n.d.; MBS Environmental, 2012.)

5.1.1 Policy implication. A Yallourn pit lake of tens of metres depth should be assumed to be chronically stratified and hypoxic/anoxic at depth, with elevated risks of metal mobilisation, MeHg production, H₂S hazards and CH₄ emissions, unless—and until—the proponent demonstrates, via independent, peer-reviewed modelling and monitoring, that these risks are controlled by proven, life-of-asset measures. In the absence of such evidence, the precautionary position is that a full pit lake is not a low-risk or low-maintenance outcome for water quality. (Boehrer & Schultze, 2008; Lund, 2015; Herrell, 2022.)

5.2 Eutrophication (Algal Blooms):

A terminal Yallourn pit lake receiving Latrobe–Morwell floodwaters will import substantial nitrogen and phosphorus, and—because it lacks a natural outflow—these nutrients will accumulate over time. Deep, steep-sided morphology further encourages thermal stratification, isolating bottom waters and fostering internal nutrient loading from anoxic sediments (Imberger, 2001; Boehrer & Schultze, 2008). This combination is a classic pathway to chronic eutrophication: initial blooms of chlorophytes are typically followed by cyanobacterial dominance in warm, nutrient-rich, stratified conditions (Paerl & Otten, 2013; Hale, Boon, Lloyd, Vietz, & Jempson, 2020). These risks are not hypothetical in the region; Gippsland Lakes have a history of harmful algal blooms under high-nutrient/low-flushing regimes, and the Latrobe/Morwell catchments are recognised as nutrient-enriched and turbid (Boon, Cook, Woodland, & Aldridge, 2015; Hale et al., 2020).

Mechanistically, sustained stratification promotes hypolimnetic anoxia, which solubilises iron-bound phosphorus and recycles phosphorus to surface waters during turnover events, locking in high productivity (Imberger, 2001; Søndergaard, Jensen, & Jeppesen, 2003). Overseas syntheses and Australian pit-lake case studies (e.g., Collie Basin) show that, without engineered mixing or major external-load reductions, pit lakes tend toward persistent cyanobacterial problems, degraded water clarity, and episodic taste–odour or toxin events (Lund, 2015; McCullough et al., 2010; Paerl & Otten, 2013). Warmer summers and longer stratified periods under climate change further increase bloom likelihood and duration (Paerl & Otten, 2013).

The public-health and amenity implications are significant. Cyanobacteria (e.g., *Microcystis*, *Dolichospermum*) can produce hepatotoxins and neurotoxins, rendering water unsafe for recreation, stock, or wildlife; Australian guidance sets conservative



trigger values for cell counts and toxins in recreational waters (National Health and Medical Research Council [NHMRC], 2008/2019 addendum). In short, the DMRP's implicit assumption of a clear-water, recreation-grade lake lacks evidentiary support given the trophic status of inflows and the closed-basin hydrology (Boon et al., 2015; Hale et al., 2020).

From a governance perspective, eutrophication in a terminal pit lake implies perpetual management obligations—continuous monitoring, bloom forecasting, potential artificial destratification, and event-based closures—well beyond typical mine-closure horizons (Hipsey, Bruce, & Hamilton, 2013; Lund, 2015). Absent a transparent long-term owner–operator framework and funding for water-quality management, the liability for blooms and fish kills risks defaulting to the state after bonds are released. FOGL's position is that any approval must require independently peer-reviewed nutrient budgets and coupled hydrodynamic–water-quality modelling (e.g., AED/CE-QUAL-W2), demonstration of load management and mixing/oxygenation contingencies, and a binding governance plan for life-of-asset water-quality stewardship (Hipsey et al., 2013; Hale et al., 2020)

5.3 Turbidity and Sedimentation: The Yallourn pit margins and adjacent overburden (e.g. Township Field) include large areas of unconsolidated, sodic/dispersive materials that were never fully capped or stabilised. As lake levels rise, these surfaces—and residual vegetation and stockpiles—will be progressively inundated. Submergence of organic matter is expected to leach dissolved organic carbon (tannins) and nutrients, contributing to brown-coloured water and elevated oxygen demand; this behaviour is typical where terrestrial plant material is drowned in newly formed waterbodies (Boon, Cook, Woodland, & Aldridge, 2015; Wetzel, 2001). In parallel, dispersive clays commonly release fine colloids under low-ionic-strength conditions, sustaining high turbidity unless materials are treated or isolated; Australian practice identifies these soils via Emerson class/pinhole tests and prescribes filter-compatible designs to avoid erosion and piping (Standards Australia, 2017b; Sherard, Dunnigan, Decker, & Steele, 1976; Wan & Fell, 2004).

Pit-lake morphology further compounds the risk of persistent turbidity. Deep, steep-sided basins tend to stratify, which suppresses whole-lake mixing and can reduce natural flocculation and settling in bottom waters; wind energy is then focused on the littoral zone, where repeated wave attack resuspends fines and drives shoreline retreat (Imberger, 2001; Boehrer & Schultze, 2008). Unless **all** shorelines are engineered with armouring and filter layers appropriate to wave climate and fetch, progressive bank erosion and sediment inputs are likely—requirements reflected in Australian maritime design guidance but not addressed in detail in the DMRP (Standards Australia, 2005; Hale, Boon, Lloyd, Vietz, & Jempson, 2020). Experience from Australian coal pit lakes (e.g., the Collie Basin) shows long-lived water clarity issues, including colour and



turbidity, where basin geometry, erodible margins, and organic loads are not actively managed (Lund, 2015; McCullough et al., 2010).

The ecological implications are predictable. Elevated, chronic turbidity and colour constrain the photic depth, limiting colonisation by submerged macrophytes and associated habitat functions; where internal loading and stratification occur, light limitation often persists despite seasonal turnover (Søndergaard, Jensen, & Jeppesen, 2003; Boon et al., 2015). Given the nutrient-enriched, turbid character of Latrobe/Morwell inflows and the absence of a natural outflow to export sediments and solutes, the expectation should be for a **long-term, highly turbid, brown, low-transparency water body** rather than a clear, recreation-standard lake (Boon et al., 2015; Hale et al., 2020). Managing such conditions typically requires ongoing shoreline stabilisation, engineered mixing/oxygenation, and active catchment-load controls—measures that entail enduring governance and funding beyond initial closure (Lund, 2015; McCullough et al., 2010).

5.4 Aquatic Ecology (or lack thereof): The DMRP's references to future fishing and recreation overlook well-established ecological constraints associated with deep coal-pit lakes. By design, such lakes have steep margins and very limited littoral benches, depriving native fishes, frogs, and macroinvertebrates of the shallow, vegetated habitats required for spawning, refuge, and foraging (Koehn, 2004; Hamer & Parris, 2011; Wetzel, 2001). Where littoral shelves are absent or narrow and substrates are unstable, macrophyte colonisation is poor, habitat complexity is low, and biodiversity is correspondingly reduced (Koehn, 2004; Wetzel, 2001).

Water-quality constraints compound these structural deficits. Deep pit lakes commonly stratify for long periods, producing hypoxic or anoxic bottom waters and sharp redox gradients that favour internal nutrient loading and the mobilisation of reduced species of iron, manganese and associated trace metals (Boehrer & Schultze, 2008; Imberger, 2001; Johnson & Hallberg, 2005). In nutrient-rich, stratified waters, cyanobacterial blooms are more likely and more persistent, further degrading ecological condition and recreational suitability (Paerl & Otten, 2013; Boon, Cook, Woodland, & Aldridge, 2015; Hale, Boon, Lloyd, Vietz, & Jempson, 2020). These risks are consistent with Australian pit-lake experience in the Collie Basin, where long-lived clarity and chemistry issues have required active management (Lund, 2015; McCullough, Schultze, & Wendt-Potthoff, 2010).

Under such conditions, stocking fish does not guarantee a sustainable fishery. Low dissolved oxygen in deeper layers constrains habitat volume, while episodic bloom toxins in surface waters can create additional stressors; together these factors reduce survival, growth, and recruitment for native and introduced species (Koehn & Lintermans, 2012; Paerl & Otten, 2013). Seymour (2025) accordingly cautions that a Yallourn pit lake could be functionally depauperate—potentially “essentially abiotic” at



depth or incapable of supporting a self-sustaining aquatic community—unless significant, ongoing engineering interventions are implemented.

The DMRP does not provide an ecological risk assessment to demonstrate how the proposed lake would avoid these outcomes. By contrast, analogous projects underscore the challenge. In Victoria, the Hazelwood rehabilitation has been referred for federal assessment in part due to water-quality risks, with a cautious approach to ecological outcomes pending further evidence (Department of Climate Change, Energy, the Environment and Water [DCCEEW], 2023). Internationally, some lignite-district pit lakes have been converted to recreational water bodies, but only after decades of **active** measures such as external water inputs, liming, flushing, aeration, and strict catchment controls—efforts documented in the global mine-pit literature rather than assumed as default outcomes (Castendyk & Eary, 2009; McCullough et al., 2010). On the balance of current science and experience, FOGL’s assessment is that a Yallourn pit lake is more likely to constitute a **perpetual management obligation** than a thriving ecosystem or reliable recreational amenity (Boehrer & Schultze, 2008; Lund, 2015; Paerl & Otten, 2013).

In the absence of compelling evidence, portraying the pit lake as a “community asset” is, at this stage, **more spin than substance**.

5.5 Community Safety and Other Issues: Though not the focus of our submission, we note community concerns such as: the stability of pit walls (especially given past mine batter collapses in Latrobe Valley, potential for land subsidence affecting nearby roads or the Morwell township if groundwater regimes change, and safety hazards of a deep lake (drowning risk, unstable shores). The DMRP should transparently address these. For water quality specifically, we recommend a robust monitoring and adaptive management plan if the lake goes ahead, with clear accountability. For instance, if pH falls or metals rise, who will act and pay for remediation? Without clear answers, FOGL has low confidence in the “lake as panacea” narrative.

5.6 Concluding Remarks: In summary, FOGL urges that **alternative rehabilitation options** be reconsidered or at least comparatively evaluated. A full pit lake may not be the optimal outcome environmentally. Possibilities include creating a shallower wetland or series of wetlands (requiring less water and perhaps promoting a treatment wetland effect), partial backfilling before lake formation to reduce depth, or hybrid options that maintain a smaller water body plus reconnect a managed river channel. These alternatives might better support biodiversity and pose fewer water quality risks. At minimum, the final approval should impose conditions for water quality standards



and ongoing management to be met (under EPA oversight) before any “handover” of the lake to public use, preferably paid via a trust fund established by Energy Australia.

6.0 Cost Burdens, Liability, and Trailing-Liability Scheme

Experience in the Latrobe system shows that when mine-related water infrastructure fails, the economic consequences can be substantial and borne widely. The 2012 collapse of the Morwell River Diversion (MRD) inundated the Yallourn mine, disrupted power generation, and required an estimated A\$150 million repair program (ABC News, 2014; Environment Victoria, 2012). A similar high-risk MRD event in 2021 triggered emergency government action, demonstrating that such risks persist even late in the asset life-cycle (Environmental Justice Australia, 2021a, 2021b). Post-closure, an MRD failure that irreversibly diverts the river into a terminal pit lake would trigger additional costs—emergency response, stabilisation works, and long-term ecological remediation for the Latrobe–Gippsland Lakes system. Without enforceable, ring-fenced financial assurance and clear post-closure accountability, these liabilities can fall back on the public (Resources Victoria, 2024).

Downstream, chronic management costs are also likely. Reduced inflows driving higher salinity and frequent algal blooms would necessitate expanded monitoring, public health warnings, and potentially treatment upgrades under national recreational-water standards (Boon et al., 2015; National Health and Medical Research Council [NHMRC], 2008/2019 add.; Paerl & Otten, 2013). Ecological impacts—wetland degradation, vegetation loss, fish kills—carry rehabilitation costs (e.g., revegetation, environmental-water deliveries) and can erode regional amenity and tourism tied to the Gippsland Lakes (Department of Environment, Land, Water and Planning [DELWP], 2022; Hale, Boon, Lloyd, Vietz, & Jempson, 2020). These are indirect yet material economic losses for local communities.

From a policy standpoint, a credible rehabilitation outcome is one that minimises residual risk and public cost. The current DMRP externalises substantial ecological and financial risks—particularly from MRD performance, pit-lake water quality, and Ramsar-site dependencies—onto the public domain. That is unacceptable in a system already under hydrological stress (DELWP, 2022; Hale et al., 2020). Aligning with contemporary policy expectations that mining operators should internalise rehabilitation water costs—even paying full market rates—and not diminish environmental values (ABC News, 2025; Resources Victoria, 2024), any approval must require the proponent to internalise costs and demonstrably drive down risk.

6.1 Trailing-Liability Scheme: Legislative Developments

Victoria has acknowledged the risks of “long-tail” mine rehabilitation and introduced a **trailing-liability regime** for declared mines, including Yallourn, Loy Yang, and



Hazelwood. Through amendments to the *Mineral Resources (Sustainable Development) Act 1990*, this framework empowers government to “call back” former title-holders or related parties to complete rehabilitation if the current licensee fails. Modelled on the Commonwealth’s offshore petroleum laws, the scheme is a last-resort safeguard designed to protect taxpayers from orphaned liabilities and ensure operators remain accountable for long-term risks (Victorian Government, 2022; Resources Victoria, 2022, 2024; Australian Mining, 2023).

6.2 FOGL Recommended Safeguards

To reflect this legislative trajectory and address the identified risks, FOGL recommends the following safeguards, aligned with the **polluter-pays principle** and reinforcing contemporary Victorian policy:

1. **Strengthened Financial Assurance**

Maintain or increase rehabilitation bonds or equivalent securities until independent verification confirms MRD stability and pit-lake water quality; establish a dedicated long-term stewardship fund for ongoing water-quality monitoring and incident response (Resources Victoria, 2024).

2. **Ecological Offsets and Improvements**

Make river-water access contingent on delivering a net ecological benefit, through entitlement retirement or substitution with manufactured/recycled water (DELWP, 2022).

3. **Full-Cost Water Pricing**

Price bulk water access to include externalities (e.g., lost ecosystem services, water-quality risk), with revenues ring-fenced for Lake and river health programs. This aligns with expectations that mine rehabilitation water should be priced at full, market-based rates (ABC News, 2025; DELWP, 2022).

4. **Downstream Liability Retention**

Include licence conditions retaining proponent liability for downstream ecological harms (e.g., salinity-induced dieback, bloom-related fish kills) linked to MRD failure or pit-lake operations, with enforceable remediation triggers (Resources Victoria, 2024).

5. **Explicit Trailing-Liability Provisions**

Embed Victoria’s trailing-liability scheme into the approval framework, ensuring the State’s call-back powers apply to former licensees and related parties (post-5 May 2022), regardless of ownership changes or closure timelines (Victorian Government, 2022; Resources Victoria, 2022; Resources Victoria, 2024).

6. **Transfer & Closure Conditions**

Require parent-company guarantees or letters of credit, valid run-off (tail)



insurance (with no cross-insured clauses), and regulator vetoes on licence transfers, unless it can be demonstrated that financial assurances and obligations remain intact.

Without such measures—particularly the trailing-liability backstop—there is a high risk that public agencies will become managers of last resort for MRD failures, pit-lake water-quality crises, and other latent liabilities. A rehabilitation outcome genuinely in the public interest must ensure minimal residual risk and negligible long-term cost to the community.

7. Cultural and Community Considerations

The Gippsland Lakes and Latrobe River are part of the Country of the Gunaikurnai Nation, who have cared for these lands and waters for millennia. FOGL acknowledges the Traditional Owners’ deep connection to water – as the Victorian Government’s roadmap states, “*Traditional Owner access to water is vital for culture and Country.*” (Victorian Government, 2022, Section A). Water is not just a resource; it carries spiritual, ecological, and practical significance in Aboriginal lore and livelihoods. In recent years, the Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC), alongside other Traditional Owner groups, have articulated clear expectations for water management. This includes the “Water is Life: Traditional Owner Access to Water Roadmap” (2022) and a Joint Statement on Water for Country in Gippsland (2023) by GLaWAC and environmental agencies. FOGL strongly supports these positions and incorporates them here, as the Yallourn rehabilitation has direct bearing on water for Country.

7.1 Traditional Owners’ Voice on Water:

The Joint Statement on the Central and Gippsland Sustainable Water Strategy describes “the same tragedies unfolding: rivers depleted by over-extraction; wetlands on the brink of collapse due to insufficient flows; groundwater-dependent ecosystems drying and dying; and contaminants leaching into our waterways” (Environmental Justice Australia, 2023, p. 2). Those concerns map directly onto the risks posed by the Yallourn DMRP, where any loss of Morwell/Latrobe flows or degradation in water quality would further erode cultural values and uses across the Lower Latrobe wetlands and the Gippsland Lakes. The state’s Ecological Effects Assessment likewise cautions that mine-rehabilitation water use must not negatively impact Traditional Owner values, underscoring the need to protect freshening flows that sustain Ramsar-listed habitats and customary fisheries (Hale, Boon, Lloyd, Vietz, & Jempson, 2020).

Victoria’s Water is Life: Traditional Owner Access to Water Roadmap commits government to increasing Traditional Owner roles, access and decision-making in water, noting Traditional Owners currently hold a very small fraction of available entitlements (Victorian Government, 2022, Section A; Section B—Nation Statements). In Gippsland,



this commitment has begun to translate into practice: the Gunaikurnai Land and Waters Aboriginal Corporation (GLaWAC) has received two gigalitres of unallocated water in the Mitchell River for cultural purposes (Gunaikurnai Land and Waters Aboriginal Corporation, n.d.; Government of Victoria, 2023). More broadly, Gunaikurnai joint management of parks around the Lakes demonstrates that Traditional Owners are rights-holders and knowledge-holders in land and water governance, not merely stakeholders (Gunaikurnai Traditional Owner Land Management Board, 2018).

FOGL's position is that Yallourn rehabilitation planning should be co-designed with GLaWAC and aligned with Water is Life: any water allocation decisions must demonstrably maintain or improve cultural flows and values, not diminish them. In practical terms, this means safeguarding flow regimes that support culturally significant species, wetlands and practices; embedding Traditional Owner objectives in environmental-flow rules; and ensuring that any mine-related water use neither reduces water available for Country nor transfers long-term risks to Traditional Owners and the wider community (Hale et al., 2020; Victorian Government, 2022).

7.2 Community Concerns and Consultation: Beyond Traditional Owners, communities across the Latrobe Valley and the Gippsland Lakes have expressed consistent concerns about transparency, risk, and long-term accountability. FOGL is part of a coalition of community groups that, during the development of the Central and Gippsland Sustainable Water Strategy, argued that community voices advocating for healthy rivers were not being adequately heeded (Environmental Justice Australia, 2021b). The consultation experience to date on the DMRP—informal briefings and limited technical material available prior to formal exhibition—has reinforced perceptions that complex decisions are being made without accessible information or sufficient time for deliberation. FOGL welcomes DEECA's current formal engagement on the DMRP and EnergyAustralia's stated engagement principles, but emphasizes that commitments must translate into tangible practices that build trust.

A central community concern is confidence in long-term outcomes. Residents have lived through significant impacts from the coal era (for example, the 2014 Hazelwood mine fire) and expect rehabilitation approaches that do not create new hazards or offload future liabilities to the public. A robust program that demonstrably reduces risk—rather than normalising it—will be essential to social licence. Conversely, if rehabilitation delivers safe, attractive landscapes that genuinely enhance public access, cultural values, and biodiversity, it can contribute to social recovery and regional pride.



7.3 Misleading Framing of Net Water Gains for the Environment and Traditional Owners

It's important to carefully scrutinise the Minister's recent statement about water allocations in the Latrobe system—particularly the reference to the $\frac{3}{4}$ bench allocation and the share provided to GLaWAC. While GLaWAC and the environment now receive a combined 10.5 GL per annum, this must be understood in the context of significant losses in surface return flows from power stations, which have historically totalled over 23 GL per year (not including Hazelwood). These return flows—comprising rainwater runoff, stormwater, pumped groundwater (dewatering), and recycled cooling water—have provided incidental environmental and consumptive benefits over many decades. As noted in the Alluvium Technical Report (pp. 12–13), these flows are not upstream environmental releases but by-products of industrial operations that, once returned to the system, augmented downstream availability. However, these benefits have no legal protection—under existing arrangements, generators could legally curtail or redirect them without breaching entitlement conditions. Presenting the new entitlements to GLaWAC and the environment without acknowledging this net loss of return flows is misleading and risks overstating the actual water available for ecological and cultural purposes. The shift from return flows to direct extraction must be viewed through a loss–gain lens, not as a net gain in access.

Water allocation decisions that exclude or undervalue cultural water reinforce historical dispossession and risk undermining Victoria's own commitments to justice, treaty, and reconciliation. Any fair and future-focused bulk water entitlement decision must integrate First Peoples' water values and entitlements, not treat them as incidental or secondary considerations. The Minister for Water, in considering a new entitlement, must consider “the needs of other potential applicants” – arguably this includes Traditional Owner groups who might apply for water for cultural use. If a large volume is given to mines at a nominal price, it could preclude future allocations to Traditional Owners (since the resource pool would be diminished) or set a precedent of cheap sale of water that undermines the value of Aboriginal water holdings. It is notable that the consultation on these entitlements arose after community and Traditional Owner advocacy; the Minister is legally required to consider submissions on the issue, reflecting the importance of these voices in the process. Ethically, failing to incorporate cultural water value is a form of systemic bias – the models readily quantify agricultural dollars but not Indigenous benefits, thus reproducing power imbalances in resource governance.

7.4 Effective community engagement and governance measures:

To that end, FOGL recommends the following **engagement and governance measures** be embedded in approvals and conditions:



- Publish plain-language summaries alongside full technical reports, with an open “data room” for models, assumptions, and monitoring datasets.
- Fund independent expert reviews (selected with community and Traditional Owner input) to test hydrology, geotechnical design, water quality, and ecological risk assessments; publish all review findings and proponent responses.
- Establish a standing joint advisory committee—comprising GLaWAC, local councils, catchment managers, community groups, and independent experts—to guide design choices, set monitoring priorities, and review performance.
- Create an open environmental performance dashboard (flows, salinity, algal alerts, bank stability, compliance actions) with annual public audits and adaptive-management updates.
- Develop, consult on, and publish an Access and Safety Plan for any post-mining waterbody or parkland (including clear rules for closures during hazard events), and a Cultural Heritage Management Plan co-designed with Traditional Owners.
- Co-design naming, interpretation, and public-realm elements with Gunaikurnai representatives to ensure Country is respected and stories are accurately told.
- Implement a formal grievance and escalation pathway, including timelines for response, independent mediation options, and a clear link to regulatory enforcement where issues persist.

FOGL’s position is straightforward: a credible rehabilitation process must be transparent, independently scrutinised, and co-governed with Traditional Owners and the broader community. Only then will the DMRP earn durable confidence and deliver outcomes that the region can live with—and live off—for generations.

In conclusion, FOGL stands in solidarity with the Gunaikurnai and other community voices in insisting that water for Country and community is a priority use. The Latrobe Valley’s transition away from coal must not become a new chapter of environmental injustice. Instead, it can be an opportunity: to return water to the environment, to restore wetlands, and to empower Traditional Owners in managing Country. The Joint Statement on the SWS put it aptly: the new strategy must address the water crisis with honesty and not *“compromise our water ecosystems for future generations.”* FOGL believes the same principle applies here – we must not compromise the Gippsland Lakes and Latrobe River for a mine rehabilitation that could be done differently. We call on the government and EnergyAustralia to uphold **“Water is Life”** in practice by revising the DMRP in collaboration with Traditional Owners and community stakeholders.



8. Key Recommendations

FOGL's **key recommendations** are as follows (to be read in conjunction with the analysis above):

8.1 Preconditions and Assessment Pathway

- Resolve Morwell River Diversion (MRD) governance, ownership, and engineering assurance first. Establish an independent expert review panel for technical oversight; secure Morwell–Latrobe connectivity capable of passing baseflows and winter–spring freshes under future climate scenarios.
- Treat an EPBC referral and a Victorian EES as standard safeguards for proposals with potential Ramsar/water-trigger implications; design for no significant impact with enforceable suspension triggers tied to Ramsar indicators.
- Re-assess system water availability under contemporary climate sequences before considering any new consumptive access. Require that a formal Section 40 (Water Act 1989, Vic) decision record be prepared, explicitly documenting how environmental values, Ramsar obligations, public uses, Traditional Owner rights, and existing entitlement reliabilities are preserved. Any proposal that fails to satisfy these criteria cannot lawfully proceed: granting an entitlement that exacerbates the 129 GL/year environmental water deficit or compromises the Environmental Water Reserve would be inconsistent with Section 40 and open to legal challenge.

8.2 Pricing Architecture (LRMC Floor, Full Value)

- Set a policy floor of \$2,500–\$3,000/ML benchmarked to the long-run marginal cost of manufactured supply (advanced recycled/desalinated water).
- Integrate Total Economic Value: include ecological services, cultural values, recreation/tourism and option/existence values; publish the valuation method, ranges and uncertainties.
- Apply scarcity/risk multipliers that rise as environmental shortfalls and storage constraints tighten; include an MRD-assurance levy.
- Hypothecate all net revenues to a Latrobe–Lakes Restoration Fund for environmental water recovery, wetland/ecosystem works, and Traditional Owner cultural-water outcomes; report publicly.
- Review and index (CPI + scarcity factor) annually/biennially; avoid low initial water prices that encourage extraction.



8.3 Access Rules and Environmental Safeguards (only if Preconditions are met)

- Very low-reliability, high-flow-only access: permitted only when flows exceed the 80th–90th percentile (naturalised) at key gauges and when Environmental Water Reserve obligations are met.
- Seasonal fresh protection (FMDT): guarantee frequency, magnitude, duration and timing of winter–spring freshes; no pumping on the rising limb and early recession of defined freshes (June–November); minimum annual fresh count set by the regulator using naturalised percentiles.
- Hard cease-to-pump triggers: no take below monthly EWR base-flow thresholds; suspend extraction if Lake Wellington salinity, wetland indicators, or fish-passage metrics exceed thresholds.
- MRD dependency: if Morwell–Latrobe connectivity is impaired (e.g., MRD breach/decommissioning or failure to pass ≥ 5 -year ARI events), automatically suspend access pending review.

8.4 Volume Caps, Reliability and Compensation

- Impose strict annual caps that are small relative to system flows; adaptive caps tighten with climate indices and drop to zero in drought/low-storage years.
- Class the entitlement as very low-reliability and explicitly subordinated to environmental and existing users' needs.
- No compensation: curtailments or suspensions to protect environmental/cultural values and existing users do not attract financial compensation.

8.5 Flood-Harvesting Controls (if contemplated)

- Eligibility only after the required winter–spring freshes are delivered downstream and outside no-take windows.
- Fully metered (telemetry) and debited against the annual cap—no double-dipping; always priced (never zero).
- Automatically suspended if MRD connectivity is compromised (as floods would not reach regulated decision points).



8.6 Offsets and No-Net-Loss

- Require one-for-one (or greater) offsets for any river water taken (e.g., purchase/retire entitlements for environmental use or substitute with recycled/manufactured water).
- Ensure any savings from retired power-station licences are returned to the environment, not reallocated to mines.

8.7 Traditional Owner Rights, Cultural Water and Community

Outcomes

- Undertake mandatory early engagement with GLaWAC; complete cultural impact assessments where relevant.
- Recognise that environmental improvements are cultural gains; ring-fence a defined share of pricing revenue for Traditional Owner-led cultural-water projects and joint wetland management.
- Align approvals with the Water is Life roadmap and progress toward Treaty outcomes.

8.8 Monitoring, Transparency and Adaptive Management

- Install telemetry on all extraction points; maintain a public dashboard of flows, pumping, salinity, and wetland levels; require independent annual audits.
- Establish a five-year independent review cycle with public consultation; empower the Minister to tighten or halt access if indicators deteriorate.
- Constitute an oversight committee (Traditional Owners, community, CMA, independent scientists) to guide the Restoration Fund and review performance.

8.9 Alternative Supplies and Demand Reduction

- Prefer and incentivise non-river sources (advanced recycled/desalinated water, stormwater harvesting, partial saline options, on-site optimisation); require proponents to demonstrate why alternatives cannot feasibly substitute for any requested river volume.
- Consider targeted rebates or grants for verified substitution that reduces pressure on the Morwell/Latrobe system while delivering net environmental benefit.



8.10 Policy Coherence and Decision Standard

- Demonstrate explicit alignment with CGRSWS objectives, the LVRRS principles (tightened to reflect MRD risks), climate-adaptation and biodiversity strategies, and DTF user-pays/public-interest pricing principles.
- Apply a high bar for approvals: proceed only where high-confidence evidence shows no compromise to environmental and cultural outcomes—and preferably a net improvement.
- Where MRD assurance and event-based protections cannot be satisfied, defer or decline access and re-assess the resource under contemporary climate scenarios.

8.11 Liability, Financial Assurance and Trailing-Liability Safeguards

- Require that all approvals for mine rehabilitation incorporate robust financial assurance mechanisms—including rehabilitation bonds sized to credible worst-case scenarios, dedicated stewardship funds for long-term monitoring, and enforceable licence conditions retaining proponent liability for downstream harm.
- Embed the Victorian trailing-liability regime within approval conditions so that former title-holders and related parties remain legally accountable if latent failures emerge post-closure. This should include explicit regulator call-back powers, parent-company guarantees, and mandatory run-off (tail) insurance to ensure liabilities cannot be orphaned through corporate restructuring or asset transfer.

These measures are essential to prevent public agencies from becoming the managers of last resort for MRD failures, pit-lake water-quality crises, or Ramsar-site degradation in the decades following closure.

9. Conclusion

In summary, FOGL submits that the June 2025 Yallourn Declared Mine Rehabilitation Plan is **inadequate** in its current form. The plan underestimates and under-addresses critical scientific and ecological issues, and thereby poses unacceptable risks to the Gippsland Lakes, the Lower Latrobe Wetlands, and the communities and Traditional Owners of the region. Key conclusions of our review include:

- The **Morwell River Diversion (MRD)** is structurally vulnerable, especially if subjected to overtopping or saturation from a pit lake. These vulnerabilities are further heightened by climate uncertainties and risk. Past failures (2012) show the dire consequences of MRD collapse. The DMRP's design modifications



(lowered levees, side weirs) would be likely to precipitate eventual failure, which could permanently divert the river into the mine void. This risk must be eliminated through redesign – maintaining a robust diversion channel capable of passing at least a 1-in-100 year flood without breaching.

- **Failure or misuse of the MRD would drastically reduce freshwater inflows** to the Ramsar-listed Gippsland Lakes system. This would lead to degraded wetland habitats, loss of biodiversity, and increased salinity in Lake Wellington and connected wetlands. Such an outcome threatens Australia’s obligations under the Ramsar Convention and triggers the EPBC Act water trigger, necessitating federal assessment.
- The plan’s approach to **filling a terminal pit lake** raises severe water quality and ecological concerns. A Yallourn pit lake is likely to stratify and develop anoxic, acidic bottom waters liberating metals, to experience eutrophication and harmful algal blooms, and to support minimal aquatic life. Claims that it will be a beneficial recreation or ecological asset are not backed by evidence. Long-term management and liability issues remain unaddressed.
- The **Gippsland Lakes region’s economy** – including fishing, tourism, and recreation – would suffer from any decline in lake/wetland health. Reduced flows mean fewer fish and waterbirds, harming fisheries and nature-based tourism. Conversely, robust environmental flows are an investment in the region’s sustainable economy. The costs of getting this wrong (emergency interventions, lost business, environmental repair) far outweigh the costs of adopting a precautionary, environmentally sound approach now.
- **Traditional Owners and local communities** have clearly voiced that water must be managed for the benefit of rivers, wetlands, and people, not sacrificed to expediency. The Gunaikurnai principle that “water is life” and the Joint Statement’s warning about rivers on the brink should guide decision-makers. Any rehabilitation plan must respect Traditional Owner rights, include them in decision-making, and avoid further cultural harm by degrading Country’s water.

In sum, if any use of Latrobe water proceeds, it must do so **only** after MRD integrity and event-based protections for winter–spring freshes are secured; at prices that reflect true social value; under very low-reliability, high-flow-only rules; and with transparent telemetry, hard cease-to-pump triggers, and no-compensation curtailment. Revenues should be allocated for environmental water recovery, wetland restoration, and Traditional Owner–led projects so that any authorised take delivers measurable, local benefits and a net-positive legacy.

FOGL appreciates the opportunity to present this submission. We are “independent advocates for the Gippsland Lakes,” and our aim is to ensure that decisions made in



2025 do not become regrets in the decades to come. The Latrobe Valley is undergoing a historic transition – we have the chance to transform a landscape of extraction into one of restoration. Let Yallourn’s legacy be more than a **toxic and lifeless pit lake**; let it include thriving wetlands, a flowing river, and empowered communities.

We trust that DEECA and EnergyAustralia will give full and balanced consideration to the scientific evidence, policy obligations, and community values outlined in this submission, and will engage openly with stakeholders to ensure the DMRP is strengthened accordingly. Friends of Gippsland Lakes remains committed to supporting this process in a constructive capacity and stands ready to assist in safeguarding the Gippsland Lakes for present and future generations.



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