



**Minister for Environment; Disability Services
Deputy Leader of the Legislative Council**

Your Ref: Petition No. 14
Our Ref: 62-03239

Hon Matthew Swinbourn MLC
Chair
Standing Committee on Environment and Public Affairs
Legislative Council Committee Office
Parliament House
4 Harvest Terrace
WEST PERTH WA 6005

Dear Mr Swinbourn *Matt*

Two further issues have arisen since my letter to you dated 6 October 2017 regarding Petition No. 14 against the development of a proposed waste management facility in Esperance at Lot 12 Kirwan Road, Merivale (Lot 12). I understand that this matter will come before the Standing Committee on Environment and Public Affairs soon, and so have provided further detail here for your consideration.

1. The Department of Water and Environmental Regulation (DWER) has advised that the Environmental Protection Agency (EPA) received a referral from the Shire of Esperance regarding a proposal to develop a waste management facility at Lot 12 Kirwan Rd to on 23 October 2017. In line with previous advice, this referral will require DWER to undertake a more detailed investigation into the proposal. Note also that the proposal will be made available on the EPA website and open for a seven day public comment in the coming weeks. The EPA will make a decision on whether or not to assess the proposal soon thereafter.
2. I understand that the Department of Biodiversity, Conservation and Attractions recently submitted advice and recommendations on the proposal to the Shire of Esperance on 30 June 2017. I have attached this advice here to ensure it is duly considered by the Standing Committee.

Thank you for the opportunity to provide further advice on this Petition.

Yours sincerely

Hon Stephen Dawson MLC
MINISTER FOR ENVIRONMENT

26 OCT 2017

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Our ref: 2011/002198 27.3.8 PRS41220
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Shire of Esperance
Chief Executive Officer
PO Box 507
ESPERANCE WA 6450

For Attention: Mathew Scott

Dear Mr Scott

REVIEW OF THE HYDROGEOLOGICAL REPORT FOR THE PROPOSED WASTE MANAGEMENT FACILITY LOT 12 MERIVALE ROAD

The Department of Parks and Wildlife, South Coast Region has reviewed the following documents relating to the proposed waste management facility:

- *Phase 1 – Hydrogeological investigation, March 2017*
- *Due Diligence and landfill capability assessment, March 2017*
- *Kirwan Road Site – Due Diligence Phase (presentation document named State Govt Agencies Presentation - 26 April 2017.pdf)*
- *Site 19 Esperance Flora and Fauna Survey, dated 8 March 2017*

The proposed waste facility site is located on the watershed between two catchments, one draining into the Lake Bannitup / Doombup wetland system and the second into the Lake Warden Ramsar wetlands. Ramsar wetlands are recognised as a matter of national environmental significance under the Environmental Protection and Biodiversity Conservation Act 1999 (EPBC Act). Consequently, an action that has, will have, or is likely to have, a significant impact on the ecological character of a Ramsar wetland must be referred to the Australian Government Minister for Environment and Energy and undergo an environmental assessment and approval process.

The review of the documents for the proposed waste facility has given due consideration for the Ramsar and Lake Bannitup wetlands and the following comments and recommendations have been compiled.

Comments and Recommendations

The threat of greatest concern is the potential for contaminants from the landfill to move from the site via surface water and groundwater into wetland systems west and south of Lot 12. There is the potential for the Lake Warden System Ramsar site to be impacted by the degradation of water quality.

The *Due Diligence and Landfill Capability Assessment* report authored by Talis Consulting (2017) for the Shire of Esperance indicates that Lot 12 is 70% within the Bannitup /

Doombup catchment and the remainder is within the Lake Warden wetlands catchment. The report suggests that there will be no impact to the wetlands within the Ramsar site even though Figure 12 illustrates that Lot 12 is sited along the boundary of the two catchments. It also states that a literature and data review indicates that the Bannitup / Doombup catchment is not hydrologically connected to the Lake Warden wetlands catchment. However, it is not clear whether this theory has been confirmed by site investigations. Recommendation 1 - The desktop assessment of hydrological connectivity between these catchments and the potential risk of contaminants entering the Ramsar wetland suite should be clarified through existing or targeted site investigations.

The report states that the closest Ramsar site is 15 km west of Lot 12, however, the Lake Warden System Ramsar site is located approximately 3.8 km west of Lot 12. Mullet Lake Nature Reserve is located approximately 2 km west of Lot 12. The area of Mullet Lake Nature Reserve that is currently not within the Ramsar site boundary is proposed to be investigated for inclusion within the Ramsar site and will be considered during the next revision of the *Lake Warden System Ramsar Information Sheet*. It is noted within the *Esperance and Recherche parks and reserves management plan 2016* that the crown land supporting Doombup and Bannitup Lakes is proposed for inclusion within Mullet Lake Nature Reserve, and therefore may also be considered suitable for inclusion within the Ramsar site boundary.

The Esperance region experiences episodic rainfall events that contribute significant levels of rainfall and can result in flooding. These events have been recorded in 1999, 2000, 2007, 2009 and most recently in the summer of 2017. These extreme events could result in the mobilisation of contaminants from Lot 12 moving downstream towards wetlands, including the Ramsar site.

Recommendation 2 - *The proponent should clearly demonstrate that these large rainfall events can be contained within the site and will not impact downstream wetlands.*

Under Article 3.2 of the Ramsar Convention, Contracting Parties agree that they will arrange to be informed at the earliest possible time if the ecological character of any listed wetland has changed, is changing or is likely to change as the result of technological developments, pollution or other human interference. To give effect to the undertakings of the convention, the Australian Government requests that State Government jurisdictions undertake a preliminary assessment when a potential change in the ecological character of a Ramsar site has been identified. The preliminary assessment process determines whether further investigation is warranted, in which case a full formal assessment of change in ecological character is undertaken.

Recommendation 3 - *To fulfil obligations under the Ramsar Convention, comprehensive and long-term monitoring will be required to detect changes in water quality before the Ramsar site is impacted and should include groundwater and surface water monitoring points within Lot 12 and in the surrounding areas upstream of the Ramsar site.*

Some limits of acceptable change for the Lake Warden System Ramsar site have been developed within *Ecological Character Description of the Lake Warden System Ramsar Site, Esperance, Western Australia* (Department of Environment and Conservation 2009). However, for many water quality parameters insufficient information is available and a baseline must be identified before limits can be set.

Recommendation 4 - *Monitoring of water quality parameters within Lot 12 and upstream of the Ramsar site will be required to determine appropriate baseline information and detect any change.*

Recommendation 5 - *Contingency measures should be identified that will address potential impacts from the waste disposal site before change is detected within the Ramsar site or other wetlands. It will be important that the contingency measures are feasible, for example*

mitigating the impacts from contaminated groundwater plumes may be costly and difficult to achieve.

The hydrogeological investigation provides sufficient details on the applied methodology and citing of relevant industry standards. However, the investigations are focused only on the shallow geology and there is an insufficient understanding of the deeper lithology. As discussed further below there is insufficient detail on the assumptions, limitations and uncertainty with regards to the applied methods or outcomes of the investigation. Further hydrogeological and geotechnical investigations both on-site and off-site are warranted. (refer to recommendation 6).

Some information in relation to the conceptual design of the waste management facility is provided in a presentation provided with the package; however, detail relating to the site Master Plan was not provided and therefore it is recommended that this information be presented in subsequent hydrogeological investigations.

The source, pathway and receptor concept has not been adequately explored, particularly with respect to the risk assessment of off-site impacts and the design of down-gradient monitoring infrastructure to gather baseline data.

Conflicting and incorrect naming for the reserves in the different reports, for example in the Phase 1 – Hydrogeology Investigation the name “Esperance Lakes nature reserve” is used however there is no such reserve vested in the Conservation and Parks Commission. Note that a previous CALM management plan called “Esperance Lakes Nature Reserves management plan (1999-2009)” was previously published, however this refers to a suite of five nature reserves.

The nature reserve tenure boundaries do not coincide with the surface water catchment boundaries and therefore the use of tenure boundaries when describing potential receptors is not useful. For example, the Mullet Lake Nature Reserve occurs in two different surface water catchments and basins, as defined by the Department of Water’s datasets. It is recommended that specific biological receptors are described, either by name, location coordinates, and/or mapped.

There are no details on the risk of surface water derived exports from the proposal area to downstream environmentally sensitive receptors.

Recommendation 6 – Present further information, or undertake additional investigations, to demonstrate a sound conceptualisation and understanding of groundwater flow direction and the influence of preferential flow paths.

Discussion - Interpretations of groundwater flows, as discussed in Section 6.5.2 and the appended figures, require further refinement. For example, it appears counter-intuitive that the groundwater flow direction is interpreted to occur to the southwest towards a granite outcrop depicted in Figure 13 (page 71). Figure 20 (pg 78) shows the conceptual pathways, however only considers discharge from the facility into the underlying Pallinup siltstone and does not consider lateral flow within the superficial (upper sequences) aquifer, which would occur at much higher rates. Additionally, the intersection of voids in a number of drill holes also further complicates interpretations and therefore it is suggested that significantly more work is required to fully appreciate the complexity of groundwater flow direction and the potential for preferential flow paths to alter groundwater discharge rates. A detailed understanding of this heterogeneity is required, particularly if the proponent presents groundwater pumping as a remediation strategy should there be a breach of containment and discharge of contaminants to the underlying aquifers.

Recommendation 7 – Clearly document the limitations and uncertainties with regards to the applied methods to understand the hydrogeological conceptual model.

Discussion – Further to Recommendation 1, investigations across the site were limited to shallow (< 20m) drilling and the excavation of shallow test pits. Aquifers were parameterised using data derived from falling head slug tests. Slug tests are a useful method for deriving hydraulic conductivity values and are cheap and easy to undertake. There are several limitations of this method that need to be adequately described and addressed within reports associated with this proposal. The assumptions required to be met and any shortfalls in the adopted methods need to be clearly detailed and the level of certainty with respect to derived predictions needs to be clearly stated. For example, the level of certainty with regards to understanding the deeper lithology needs to be detailed and justification for undertaking only shallow investigations and the use of slug tests (as opposed to other quantitative methods) needs to be provided. Based on the information provided thus far, it is apparent that there is sufficient uncertainty in the conceptual understanding of the hydrogeological conceptual model to warrant undertaking more detailed geotechnical and hydrogeological investigations.

Recommendation 8 – Present sufficient evidence that there is no hydrological (groundwater and surface water) connection between the proposal area and sensitive biological receptors associated with the Ramsar Lake Warden Catchment or other areas down-gradient from the proposed waste management facility.

Discussion – It is stated in the Flora and Fauna survey (Section 5.3, page 20) that the Doombup Catchment is not hydrologically connected to the Lake Warden Catchment area. The Phase 1 – Hydrogeological investigation (Section 10, page 44), states that there is no hydrological connection with respect to the site and the 'Esperance Lake Nature Reserve'. As described above, the use of tenure boundaries to describe potential impacts upon biological receptors is not useful. The spatial relationship between the different surface water catchments, tenure boundaries and different aquifers is not adequately detailed or justified. In the first instance, it is recommended that consistent terminology is used in the various reports and that sufficient evidence is presented to support the assumption that there is no hydrological connection between the site and that of sensitive biological receptors located down-gradient of the proposed waste management facility.

Recommendation 9 – Provide details on the proposed waste management facility proposed at Lot 12 and details on its classification and the proposed tonnages of materials.

Discussion – It is understood that the Wylie Bay waste management facility is a prescribed premises (Class II or III, category 13, 57, 62 and 64) that is near its end of life and the proposed landfill facility is to fulfil ongoing requirements for waste disposal. In order to fully appreciate the potential flow paths and impacts upon sensitive downstream receivers it is essential that details are provided on the proposed waste management facility, in particular the location of the site, the prescribed premises category and the category production design capacity. At a minimum, any relevant supporting documents are to be cited and summarised within the hydrogeological investigation reports.

Given that groundwater catchments are not always coincident with surface water catchments and that 1) groundwater seepage is stated by Talis to be to the south-west and 2) waters from Neridup Creek feed wetlands (un-named, but to the east of where Neridup Creek passes to the south of the site) to within 2km of the south west corner of the site, it would seem that groundwater investigations to date are inadequate for determining potential for groundwater input to the upper extent of the Warden wetlands.

Recommendation 10 - It would be useful to show flood modelling in the lowest points where the catchments meet (i.e. between the eastern extent of the Neridup wetlands and the

Bannitup / Doombup catchment. There is a comment that some existing flood model suggests closest proximity to site is 2km (4.14 of diligence report). The Neridup system, at the eastern end of the Warden wetlands, is also south-west of the site and there have been no studies of whether groundwater flows between catchments.

Currently it is not possible to comment on whether the purported very slow ground water transmissivity is realistic but would partly depend on how uniform the underlying substrates are – there may be undetected preferred pathways. (Refer to recommendation 6)

The potential for leakage in the longer-term is concerning due to insufficient physicochemical characterisation on the Pallinup Siltstone that overlies the sites weathered crystalline basement rocks. Although the site is to be lined with geotech materials these materials degrade over time and the underlying Pallinup has variable properties and they are likely to change in the location of geological faults that also coincide with ephemeral drainage lines.

The potential leakage of contaminants in gaseous or liquid phase through these conduits in the longer term is a concern. Has the risk assessment/prefeasibility considered these issues adequately and developed contingency plans to monitor and manage?

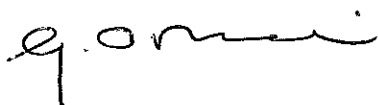
The water quality on site appears to be quite good in comparison to the Esperance district and what is known of the area. Some elevated nutrient values are reported, but that is entirely normal within the natural system and the same levels have been recorded in the Ramsar lakes (e.g. nitrates higher than freshwater guidelines).

The hydrogeological report makes a range of assumptions and predictions based on one month's data. Some of the bores had only one sample taken from them after establishment, yet Talis report on groundwater level trends etc. Experience has shown that it takes a few years to build up reliable groundwater history enabling trends to be predicted accurately.

Recommendation 11 - As a minimum, at least one year's worth of monitoring is required, and the data must relate back to the surrounding climate over a longer period. As an example - the bores around Lake Wheatfield show a 5-7 year recharge/discharge cycle in line with catchment climate, equating for as much as a 50% variation in groundwater level, salinity and as much as a 2pH point variation between summer and winter.

Should you have any queries regarding this application, please contact Stephen Butler on 9083 2100.

Yours sincerely



Greg Mair
REGIONAL MANAGER

19 June 2017