

[https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/2415/5045/7219/Richard Loyn Mordialloc Bypass waterbirds and other fauna ESS review v3.pdf](https://s3.ap-southeast-2.amazonaws.com/hdp.au.prod.app.vic-engage.files/2415/5045/7219/Richard_Loyn_Mordialloc_Bypass_waterbirds_and_other_fauna_ESS_review_v3.pdf)

<http://baysidenews.com.au/2019/04/10/mordialloc-freeway-objectors-continue-fight/>

**From:** [REDACTED]  
**Sent:** Thursday, April 11, 2019 6:49 AM  
**To:** Greg.Hunt [REDACTED]  
**Cc:** Jonathan (G. Hunt, MP) Hendropurnomo ; Jonathan (G. Hunt, MP) Hendropurnomo  
**Subject:** Re: Please protect Edithvale Wetlands from threats anticipated from the State Government's proposed Mordialloc Freeway

Dear Minister,

Warm thanks for your efforts regarding the threat to Edithvale Wetlands from the State Government's proposed railway trench. We found only afterwards that by the time we approached you, the Minister had already granted EPBC approval and that the State Planning Minister had waited for this approval before announcing his own final approval. We had misunderstood the process and had thought you would have had time to intervene with your Environment Minister after the State Minister's approval was announced. Not so!!

We do not want to make the same mistake with a new and terrible threat to the Edithvale Wetlands - and in this case also to the South East Green Wedge – from the State Government's plan to construct what they call the Mordialloc Freeway\* to link the Mornington Peninsula Freeway to the Dingley Freeway. Hearings of the Inquiry and Advisory Committee (IAC) for the Environment Effects Statement for this freeway ended on 15 March, and the Committee's findings are due to be sent to the State and we presume Commonwealth Ministers very soon.

Having sat through most of the EES panel hearing, I am aware that there are uncertainties about whether the impact of the proposed freeway (to be built on a 1-2 m earth mound plus overpasses at the intersections) on the groundwater flowing under it towards the Edithvale Wetlands, where it surfaces and feeds the wetlands, might jeopardise the Ramsar-listed wetlands bird habitat, either by facilitating the passage of contamination from toxic chemicals including PFAS that have leached into the groundwater and creeks from the legacy landfills to the north or by impacting on the levels of water in the wetlands.

The more serious threat emerged only during the EES hearing, from the evidence of the Council bird expert Richard Loyn, who told us that Edithvale Wetlands are part of a wider Carrum Wetlands Important Bird Area (IBA), also known as a Key Biodiversity Area, (KBA) one of 30 IBAs in Australia designated by Birdlife Australia, that extends from the Eastern Treatment Plant and Melbourne Water wetlands across Thompson Road in Bangholme through the Edithvale and Seaford Wetlands to the Braeside Park and Woodlands Wetlands adjoining the proposed freeway reservation. and that the freeway, whether or not it has high, solid, fauna walls to protect the endangered birds that fly between the various wetlands along the reservation, will threaten the connectivity necessary for the birds current use of this habitat.

Please would you ask Minister Price to withhold any approval for this project before – and after - the federal election? And please would you ask her to ensure that this threatening project is not approved by officers under delegation after the election is announced in the next day or so.

I will send you a separate, more detailed email with documentation later this morning. But I want to personally wish you the best of luck for the election, which we expect will be a difficult one for you. We are very mindful of the critically important support you have provided when it was seriously needed for Melbourne's Green Wedges and for other environmental issues in the South East, such as the bandicoot habitat corridors.

Yours sincerely

Rosemary West  
Councillor, City of Kingston



\* the Mordialloc Freeway is not in Mordialloc and it ends in traffic lights at the Dingley Freeway, but presumably its proponents reckoned that the Braeside Bypass would not generate the same spin.

**From:** [Redacted]

**Sent:** Thursday, April 11, 2019 7:54 AM

**To:** susan telfer

**Subject:** Fw: Please protect Edithvale Wetlands from threats anticipated from the State Government's proposed Mordialloc Freeway

Hi Susan,

Please would you send me a copy of your FESWI submission? i would like to attach it to the more detailed email I plan to send to Greg Hunt later this morning in the hope he can discourage the Environment Minister from approving the freeway before the election, along with Richard Loyn's submission and the KRA submission, which provides a good overview and includes commentary on the earlier submitters. In this email I plan to make Richard Loyn's point that an impact on any part of the Carrum Wetlands IBA system diminishes the whole system. And I would like to list the impacts you have included in your submission, viz: the filling and proposal to cover the Thompson Road wetlands with solar panels and council's approval of the mowing and appropriation by the pony club for their cross-country course of the nearby grassy area previously favoured by – I forget which - bird. As well as to the uncertainty about the groundwater impacts of and the proposed mitigation measures for the Edithvale, Bonbeach and now Chelsea trenches.

In the next few days I will send a similar email to Mark Dreyfus and ask him to do what he can to discourage the Environment Minister from approving the freeway before the election, and also to draw this to the attention of the new Minister so he does not approve it in any clearing-the-desk operation after the election.

I would also like to give it to RAMF to attach to the letter they are writing to the Environment Minister in the next day or so. And ultimately to the letter we are writing to the Ramsar Committee.

Allbest

Rosemary

**From:** [REDACTED]  
**Sent:** Thursday, April 11, 2019 6:49 AM  
**To:** Greg.Hunt.MP [REDACTED]  
**Cc:** Jonathan (G. Hunt, MP) Hendropurnomo ; Jonathan (G. Hunt, MP) Hendropurnomo  
**Subject:** Re: Please protect Edithvale Wetlands from threats anticipated from the State Government's proposed Mordialloc Freeway

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Yours sincerely

Rosemary West  
Councillor, City of Kingston



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**From:** Hendropurnomo, Jonathan (G. Hunt, MP)

**Sent:** Monday, December 10, 2018 2:23 PM

**To:**



**Subject:** RE: Please protect Edithvale Wetlands from threats anticipated from the State Government's proposed railway trench

Dear Rosemary,

Thank you for your email.

Greg has asked me to inform you that he has made further representations to the Minister for the Environment, the Hon Melissa Price MP and has forwarded your emails and attachments for her urgent consideration.

Please be assured that as soon as Greg receives a response from Minister Price, he will forward it to you.

If Greg can be of further assistance to you, please do not hesitate to contact him.

Kind regards,

**Jonathan Hendropurnomo**

**Electorate Officer P/T**

Office of the Hon Greg Hunt MP

Federal Member for Flinders | Minister for Health

[REDACTED]

[REDACTED]

[REDACTED]

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**From:** [REDACTED]  
**Sent:** Monday, 3 December 2018 9:24 AM  
**To:** Hunt, Greg (MP)  
**Cc:** Hendropurnomo, Jonathan (G. Hunt, MP); Hendropurnomo, Jonathan (G. Hunt, MP)  
**Subject:** Please protect Edithvale Wetlands from threats anticipated from the State Government's proposed railway trench

Dear Minister Hunt,

Thank you for raising my concerns with State Environment Minister D'Ambrosio about the potential risks to the Edithvale Wetlands from the State Government's planned trenched rail-under-road construction for the grade separations at Edithvale and Bonbeach. This may have been a necessary step, but her response is unsatisfactory and I have gone into some detail to analyse the inadequacies in the Planning Minister's assessment, which Minister D'Ambrosio is as one might expect, reflecting.

As I said in my first email to you in September, I am asking you to take this matter up with the Federal Minister and to ask her to withhold her approval for this project, at least until the many uncertainties and loopholes, some of which I have identified in my attached letter, have been properly dealt with. Given that the IAC has fairly scrupulously – given the limits of their terms of reference – identified a number of weaknesses in the Government's case and since the ultimate risk we are dealing with is the degradation of the Edithvale Wetlands and the loss of their Ramsar-listed status, I have taken some trouble with this and hope that you can please ask the Federal Planning Minister to bring some expertise to bear on this matter.

At some point I will probably go to the media on this, and some local people are keen to write to the Ramsar Committee warning them of the risks that are in my view not being adequately dealt with here.

I hope it is not too late, and the Minister has not yet provided her approval, which was due before the end of the year.

I realise these will be busy, difficult times for you, but hope that the renewal that many people feel is needed in the Liberal Party takes it back to a more small 'c' conservative and conservationist model, such as your father and Premier Hamer embodied so memorably.

Allbest

Rosemary West



Please see attached copy of my current letter and my original attachments, and below, my original letter, which I submit in the hope that they may be relevant for Minister Price to consider.

Dear Minister Hunt,

As discussed, I would like to draw your attention to the high degree of local concern over plans by State Government to construct an 8m deep trench for the railway grade separations at Edithvale and Bonbeach. This will act as a dam wall across the groundwater flowing from the wetlands to the sea, thus threatening the Ramsar-listed Edithvale Wetlands and the last and best remnant of Coastal Banksia Woodland on Bonbeach foreshore, which includes one giant pre-settlement Banksia.

A number of local groups including Kingston Residents Association, Friends of Edithvale Seaford Wetlands and Port Phillip Conservation Council and Mordialloc Beaumaris made submissions expressing their concerns to the recent EES Advisory Committee panel. (Submissions from FESWI and KRA & KRA expert witness statement attached. Other subs plus videos of the panel proceedings are on the DELWP website. V impressive FESWI presentation worth watching ). Scott Seymour and ex-Melbourne Water expert, had a number of criticisms, notably that if the modelling and/or the mitigation turns out to be inadequate, there is no fall-back position and we lose the Ramsar listing for this, the best of the Edithvale Seaford Wetlands

FESWI had earlier (in April) written to Minister Frydenberg to ask him to undertake an independent assessment as the local MLA, Tim Richardson is so dead set on this going ahead that people don't trust the EES process, or the mitigation proposals it recommends. It is of course an EPBC matter, but unfortunately they were told the Federal Government will rely on the State EES process. The problem is that Tim has responded to the No SkyRail campaign, which is motivated, as the FESWI submission points out, by a fear campaign and vested interest. At the time they wrote to Minister Frydenberg, FESWI were also concerned about the impact on the Seaford Wetlands, but as the Carrum crossing is by elevated bridge and the Seaford hybrid road trench will be quite shallow and in line with the groundwater flow to the sea, the Seaford Wetlands are not threatened and did not warrant an EES.

If there is anything you are able to do to ensure that the Federal Government provides rigorous scrutiny over the EES for the Edithvale and Bonbeach trenches, that would be helpful. The Edithvale

Seaford Wetlands are our local equivalent of the Great Barrier Reef: to lose either would be unconscionable. I personally don't believe the mitigations proposed in the EES are capable of eliminating the risk and was able to persuade Council to accept my motion to employ three expert witnesses for the EES inquiry. With most of our Councillors belonging to one or other major party, Council will not oppose the trench, but I hope our experts helped to provide a more independent perspective than DELWP or the LXRA, whose marching orders are to get this approved asap so work can start before the State election.

I attended most of the EES hearings and was dismayed to hear that the LXRA experts were not at all confident that their proposed mitigation measure for redirecting the water that otherwise would be mounded behind the Edithvale trench – essentially an ag pipe at sea level along most of the 1.2 km trench and around the shallow points at the ends of the trench - would be effective. There was some discussion with Council's experts and with peer reviewers about alternative engineered solutions, based on a second round of GHD-AECOM modelling subsequent to their February 2017 report that identified serious risks a month prior to the Government's March 2017 decision. (See attached Age report.)

Apologies for the delay and I hope it is not too late for you to help with this, but Tim Richardson has announced this week on Facebook that the EES – and he implies, the State Planning Minister - have approved the trench. I haven't had time to look into this in detail but here is the link to Tim's statement: <https://www.facebook.com/280996218747910/posts/1167548840092639/>

I am hoping – and it seems - that the new Federal Minister Price may not yet have given it the EPBC Act go-ahead that it requires. I have not had time to read it: I'll see whether FESWI are getting their advocate, Scott Seymour to read and assess it and if so, will let you know what he says. However I fear that by then, the federal Minister may have simply accepted the EES committee findings and signed off on it.

Yours sincerely

Rosemary West

Councillor, City of Kingston

[Redacted signature]



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**Critique of Edithvale LXRA EES process and ministerial approval**

We wish to outline our concerns about the potential risks to the Edithvale Wetlands from the State Government's planned trenched rail-under-road construction for the grade separations at Edithvale and Bonbeach. In the light of uncertainties identified by the Inquiry and Advisory Committee that heard submissions on the EES, we do not believe that the State Planning Minister's approval was warranted. In the light of the uncertainties, we do not consider the Federal Planning Minister can be confident that this project will be undertaken without causing unacceptable risk to the Ramsar-listed Edithvale Wetlands. We submit that the Minister should not provide approval under the EPBC Act until all of the uncertainties about the modelling and about the proposed mitigation measures can be resolved. It is a matter of concern that the State Government has always been determined to proceed with the trench construction no matter what the risks to the Wetlands, which had been identified a month before the State Government's March 2017 decision to proceed.

The State Planning *Minister* acknowledges that *"the projects will generate both positive and negative environmental effects,"* and he relies on monitoring and mitigation measures to ensure that *"the projects are feasible and their environmental effects manageable."* (*Minister's assessment, page 7*) (Though this still begs the question about what impacts are acceptable. Friends of Edithvale & Seaford Wetlands have always said that no impacts would be acceptable.) The Minister also admits that the main mitigation solution proposed had not been successfully deployed elsewhere.

Closer examination of the IAC report shows that the Committee was not satisfied that the EES process had been able to determine what such measures should be. Clearly they hadn't: they described the proposed horizontal pipe measure as "unproven." (IAC report P 21). I attended most days of the hearing and heard experts and peer reviewers discussing a range of proposals that might or might not work. They clearly don't yet have a solution to the problem of the groundwater mounding that the initial GHD report (February 2017) identified as the principal threat to the wetlands.

Furthermore, the IAC noted that "as discussed in Chapter 6, there are uncertainties regarding the groundwater modelling, leading to uncertainty regarding likely impacts on wetland ecology". Hence the IAC recommendation came with some important conditions

and provisos including that these uncertainties need to be resolved prior to the project proceeding:

- *“The **limitations of the model and associated uncertainties** should be taken into account in the interpretation and application of the model results. Further verification of the model using additional local hydrogeological data should be undertaken prior to its use for design.”*
- *“To address these uncertainties, it is recommended that the EPR FF8 Monitoring and Mitigation Plan be developed and implemented. The IAC preferred version of EPR FF8 is shown in Appendix E.”* Hence the IAC recommendation for approval is conditional on implementation of the revised version of the EPRs. However, EPR FF8 and most of the IAC’s other main changes have not been endorsed by the Planning Minister.
- The Committee recommended approval on condition of at least 10 years monitoring. But as the Planning Minister did not approve the EPRs that specify monitoring and mitigation plans of at least 10-years duration, this is not clear. Particularly as his summary approval statement released on the LXRA website required only “several” years monitoring.

We request the Federal Environment Minister to withhold her approval of this project at least until all of the uncertainties have been resolved, the limitations overcome, risks eliminated, appropriate monitoring and mitigation measures designed and determined, EPRs finalised and at least the various plans identified on page 9 of the minister’s assessment drawn up and adopted. And the ongoing ownership and responsibility for legacy monitoring equipment has been determined. We suggest the extent of the limitations, uncertainties, risks and unproven status of the proposed mitigation measures mean that whatever resolutions, plans and finalised mitigation measures are adopted should be resubmitted to – as far as possible – the same IAC. This would surely be in line with the precautionary principle.

Please see below some examples of the limitations and uncertainties identified by the IAC in the modelling and of doubts about the “unproven” mitigation measure proposed in the EES. Also the list of mitigation measures recommended by the Friends of Edithvale-Seaford Wetlands submission as a second best alternative to abandoning the trench construction in favour of the elevated rail solution that had been adopted in the adjacent Carrum electorate to protect the Seaford Wetlands. As the Planning Minister said in his assessment, “*the EPRs set out measures to prevent, mitigate or compensate for significant adverse effects of the projects’ construction.*” Even the minister is not claiming that the EPRs will be able to undo any “*significant adverse effects*” once they have occurred.

The IAC was explicit about the risks of this project. (Clause 10.2, page 69). These include:

- A change in the Ecological Character of the Edithvale-Seaford Wetlands Ramsar Site, potentially exceeding the Limits of Acceptable Change for Critical Components, Processes and Systems, (and)
- Failure of the Edithvale-Seaford Wetlands to continue to meet the criteria for listing as a Ramsar site.

For these reasons, I submit we should not be experimenting with the Ramsar-listed Edithvale Wetlands.

The Minister admits that his *“reliance on ongoing mitigation of the projects’ effects underscores the importance of continuous monitoring and intervention if project-induced changes in groundwater give rise to environmental effects in the future”*

The problem is that these monitoring and mitigation devices are all after the fact, and their effectiveness or otherwise will only be evident once the project is undertaken and irreversible. The Friends asked for an *“an early warning system from the monitoring network of bores that extend along the edge of the projects and then along 3 West to East Transects (2 for Edithvale and 1 for Bonbeach) between the projects and Centre Swamp Drain to indicate potential adverse changes early.”* But this too would be too late, as the trench will by then be in place.

The Planning Minister in his assessment barely mentions the limitations and uncertainties in the modelling or the IAC’s recommendations to strengthen the environmental performance requirements.

And in his assessment, the Minister does not support the IAC recommendation *“prior to the completion of the Projects, prepare and fund the implementation of the Edithvale and Wannarkladdin Wetlands Monitoring and Mitigation Plan.”* Or a similar plan to monitor and mitigate the impact on the foreshore vegetation, which includes a valuable remnant and naturally recruiting stand of Coastal Banksia Woodland. These – EPR FF7, FF8 and GW3 – are the most important EPRs and they include the requirement for at least 10 years’ monitoring. The Minister needs to withhold her approval of this project at least until these plans are in place.

While the peer reviewers seem largely to have ticked off the EES draft proposals, the IAC has cited uncertainties raised by Council’s expert witness, Dr Woinarski, and many concerns raised by the Friends of the Edithvale Seaford Wetlands and the Kingston Residents Association and has proposed stronger EPRs to take account of them. Yet in the Minister’s assessment, he fails to mention these uncertainties and fails to endorse the IAC proposed changes to the EPRs, requiring these to be reworded in terms not specified.

We request Minister Price to hold off on her approval at least until the wording of the EPRs is finalised.

To summarise, the IAC has documented a number of risks and uncertainties about this project and has recommended changes to the EPRs which have been dismissed and/or not endorsed by the State Planning Minister and which should be resolved and finalised before it receives EPBC approval from the Federal Minister.

As the Kingston Residents Association pointed out in their submission:

*Modelling is still an imperfect science. The extensive modelling undertaken for the EES that recommended approving the dredging of the Port Phillip Bay Shipping Channels did not predict that Portsea Beach would be washed away, yet it was. Some government officers now accept that this was the consequence of the dredging, though early on they claimed it was the result of natural coastal processes. We are perhaps lucky if this was the worst flaw in the modelling. We still don't know what the ongoing consequences of the toxic dump between Altona and Mordialloc might be, and the monitoring for that exercise ended years ago.*

*Environmentally, the loss of Portsea Beach is trivial compared with the loss of the Edithvale Wetlands and or the last Coastal Banksia Woodland remnant on the Kingston foreshore. We submit that if the EES panel cannot be sure there will be no risk at all, they should not approve this project.*

There is also the cumulative impact of the several different infrastructure proposals threatening to impact the Edithvale Wetlands from different directions that needs to be considered. The EES for the pointless and environmentally disastrous Mordialloc Freeway, which potentially could impact on the flow of groundwater that feeds Edithvale Wetlands from the north-east, is now on exhibition. No doubt the panel that considers the EES draft for the freeway will be unable to consider the alternative favoured by the three adjacent Councils that have called for the Westall Bypass to be extended to link up with the Monash Freeway as a first priority any more than this IAC was able to consider the Skyrail alternative now under construction in adjacent Carrum, Seaford and Frankston. The State Government has now announced it will also grade separate the Chelsea level crossing, thus potentially putting a further trench in between the Edithvale and Bonbeach trenches, with no mention of any further EES.

Yours faithfully

Rosemary West  
Councillor, city of Kingston



See below:

1. Links to Ministers Assessment and EPRs.

[https://www.planning.vic.gov.au/\\_data/assets/pdf\\_file/0025/333862/Ministers-Assessment-Edithvale-Bonbeach-LX-removals-Final.pdf](https://www.planning.vic.gov.au/_data/assets/pdf_file/0025/333862/Ministers-Assessment-Edithvale-Bonbeach-LX-removals-Final.pdf)

EPRs

[https://www.planning.vic.gov.au/\\_data/assets/pdf\\_file/0026/333863/Attachment-1A-Ministers-Assessment-Edithvale-Bonbeach-LX-removals-Appendix-A-final-.pdf](https://www.planning.vic.gov.au/_data/assets/pdf_file/0026/333863/Attachment-1A-Ministers-Assessment-Edithvale-Bonbeach-LX-removals-Appendix-A-final-.pdf)

2. LXRA summary of the Minister's statement:

## What the Minister's assessment said

The Minister's assessment made a number of key points:

- The rail trenches can be built and operate with acceptable environmental effects, subject to the Minister's approval of an amended Environmental Management Framework (EMF). The EMF is a structured process for avoiding, minimising and managing potential environmental effects.
- Any impacts on the environment are minor and will be monitored and managed during and for several years after construction. This includes monitoring groundwater and foreshore vegetation.
- The Minister requested that subject matter experts work with LXRA and other agencies to design the monitoring system for groundwater flows in the area.
- Environmental Performance Requirements, which form part of the EMF, lay down the ground rules for monitoring and require LXRA to document future ownership of the monitoring network, along with accountability for compliance reporting and any remedial works required.
- A Foreshore Vegetation Groundwater Dependent Ecosystem Monitoring and Mitigation Plan will be developed and will be publicly available.

The Minister noted: '*Monitoring will ensure that no unforeseen future effects unduly impact this precious environmental asset. The projects do not threaten flora and fauna species nor migratory birds.*'

The Minister's Assessment is available on the [Engage Victoria website](#).

## What's next?

Now that the minister has given his assessment, formal approvals for the projects will be issued, including a set of Environmental Performance Requirements that will ensure the environment is protected.

This means that robust environmental protections are in place and work to remove the dangerous and congested level crossings at Edithvale and Bonbeach will begin soon.

A report from the Australian Government's Minister for the Environment on matters relevant to

the Commonwealth Environment Protection and Biodiversity Conservation Act (1999) is due before the end of this year and will conclude the EES process.

We will keep the community updated as the EES is finalised and the project progresses through final design.

.....

The rail trenches can be built and operate with acceptable environmental effects, subject to the Minister's approval of an amended Environmental Management Framework (EMF). And that Monitoring will ensure that no unforeseen future effects unduly impact this precious environmental asset.

It is true, as Minister D'Ambrosio says in her reply of 27/10 that the Inquiry and Advisory Committee that considered the EES found that *"with properly designed engineering mitigation measures at the Edithvale Project and application of all relevant environmental performance requirements (EPRs) the projects are not expected to have unacceptable impacts on the Edithvale and Seaford Ramsar Wetlands."*

.....

In her letter to you, State Environment Minister D'Ambrosio asks you to accept that the environmental management framework and the Environmental Performance Requirements will ensure that any environmental effects of the project will be "manageable."

.....

3. Extracts from the IAC report.

Page 15: Page 15: **The Inquiry and Advisory Committee recommends the following changes to the exhibited environmental and planning controls:**

**Adopt the Inquiry and Advisory Committee preferred version of the Environmental Performance Requirements as shown in Appendix E.**

**Adopt the Inquiry and Advisory Committee preferred version of the Incorporated Documents as shown in Appendix F.**

Page 25, Section **6.5 Modelling**  
**6.5.1 Regional groundwater model**

.....

The EES noted the following limitations in the regional numerical groundwater model (21):

- Most of the site-specific data used to construct the model was concentrated along the railway corridor, with limited data away from the railway corridor, leading to uncertainty regarding simulated groundwater behaviour
- The model does not explicitly represent discrete lenses of sand or clay that are known from bore logs
- There is considerable variation in monitoring periods for the groundwater data used in the models. The monitoring bores along the railway corridor have monitoring periods ranging from 2 months to 14 months.

The EES indicates that the regional numerical groundwater model was calibrated to two and a half years of groundwater level data at the Seaford Wetlands rather than the Edithvale Wetlands: *In the absence of similar long-term groundwater level data at the Edithvale Wetland, the quality of model calibration at the Seaford Wetlands has been used to demonstrate the reasonableness of similar groundwater and wetland interactions*

Dr Woinarski (expert witness called by Council) reviewed the regional numerical groundwater model and concluded that:

*Overall, the writer considers the model predictions inclusive of uncertainty are plausible. However, the writer recommends that model verification using additional hydrogeological data local to the sites should be included as part of pre-construction investigations and monitoring programs<sup>23</sup>*

A key concern raised by Dr Woinarski was that hydrogeological investigations supporting the numerical model may not have sufficient spatial and vertical density or temporal duration to characterise local conditions at a sensitivity appropriate for the predicted changes. For example, he noted that most of the monitoring wells were situated along the rail alignment rather than at transverse locations, making it difficult to determine the groundwater divide<sup>24</sup>.

Other model limitations and issues identified by Dr Woinarski included:<sup>25</sup>

- The groundwater investigation was based on a relatively short period of monitoring
- The model accuracy is of the same order as the predicted local drawdown elevations from the model
- The model reasonably predicts temporal patterns of change in groundwater levels, but not absolute levels. The latter are important for relating groundwater levels predicted by the model to the elevations of key features such as wetland areas and groundwater extraction bores
- The model does not incorporate the effects of groundwater extraction from unregistered bores, which can affect shallow groundwater flows and may be critical regarding the assessment of potential impacts on the wetlands and groundwater use
- The effects of potential leakage through trench piles was not considered;
- The climate change modelling did not consider whether changes in rainfall intensity and seasonality or evapotranspiration are significant.

The Friends of Edithvale Seaford Wetlands and Kingston Residents Association expressed concern about uncertainties in the groundwater modelling. The Friends of Edithvale Seaford Wetlands submitted that they were *“very sceptical of the overall predicted outcome”*<sup>28</sup> and drew attention to the following sources of uncertainty in the groundwater modelling in relation to potential impacts on the Edithvale Wetlands and Wannarkladdin Wetlands:

- The short timeframe of the monitoring data used to establish and calibrate the model is insufficient to provide “an acceptable degree of comfort that the modelling is confirmed as being correct”<sup>29</sup>
- The model is not sufficiently detailed to assess the potential impacts of the Projects at a scale relevant to the complex ecohydrology of the wetlands; for example, it does not account for variations in stratigraphy between different cells at the Edithvale Wetlands
- The modelling relies on the long-term efficacy and performance of the proposed sub-surface passive horizontal drain at Edithvale, does not assess the effects of potential failure mechanisms and is based on conceptual rather than detailed design
- The modelling does not consider potential impacts of the Projects on the salinity balance of the wetlands<sup>30</sup>.

The EPA submitted that more detailed site-specific data should be collected to inform the risk assessment and develop and refine mitigation measures prior to the commencement of construction works, including data on groundwater quality, water table levels, groundwater flow velocity and flow direction<sup>31</sup>.

#### **P.27 (ii) Discussion**

The EES presented a numerical regional groundwater model, which was used to examine the effects of the Projects on groundwater levels and flows.

The peer review by Dr Anthony Smith confirmed that the modelling was “fit for purpose” and did not contain significant technical flaws or errors.

However, the advice of Dr Woinarski was more guarded. He considered that the model predictions were “plausible” but identified a number of significant limitations, including concerns about whether the characterisation of local conditions in the model was at sufficient resolution to accurately predict and interpret impacts arising from the Projects. Concerns about uncertainties in relation to model predictions were raised in submissions by Friends of Edithvale Seaford Wetlands and the Kingston Residents Association. Dr Woinarski recommended that the model should be verified using additional hydrogeological data local to the sites as part of pre-construction investigations and monitoring programs.

#### **(iii) Conclusion**

The IAC considers that the regional numerical groundwater model is suitable for providing guidance on the nature and direction of impacts of the Projects at a regional scale but has greater limitations when applied at a local scale. The limitations of the model and associated uncertainties should be taken into account in the interpretation and application of the model results. Further verification of the model using additional local hydrogeological data should be undertaken prior to its use for design.

Page 42, Section 6.9 **Findings** (p.42):

The IAC makes the following findings in relation to groundwater impacts and flows:

#### **Groundwater models**

- **The EES presented conceptual and numerical models of the regional groundwater system that are ‘fit for purpose’ for determining the direction and indicative magnitude of likely impacts on groundwater levels and flows arising from the Projects.**
- **The models have some limitations that lead to a degree of uncertainty regarding the magnitude and detail of likely impacts on groundwater levels, and therefore waterlogging, groundwater users and GDEs. The models will require additional data and refinement to provide an adequate basis for the detailed design.**

### **Impacts on groundwater**

- **The IAC generally agrees with the key findings of the EES in relation to potential impacts on regional groundwater.**
- **The Projects will interrupt the natural movement of groundwater in the QAs and UTAs that underlie the Project areas.**
- **The Projects are expected to cause groundwater mounding to the east (inland) of the Project areas and groundwater drawdown to the west (seaward) of the Project areas. Without mitigation measures, the impact will be significantly greater at Edithvale than at Bonbeach.**
- **The EES proposed incorporating mitigation works (a passive sub-surface horizontal drain) into the Edithvale project to reduce impacts on groundwater levels. Groundwater modelling has shown that horizontal drain at Edithvale would significantly reduce the impacts of the Edithvale Project on groundwater mounding and drawdown.**
- **Similar mitigation measures were not proposed for the Bonbeach Project, both because the magnitude of impact on groundwater is smaller than at Edithvale, and also because the groundwater modelling showed that a horizontal drain at Bonbeach would exacerbate, rather than mitigate, groundwater mounding and drawdown.**

### **Feasibility of mitigation options**

- **The effectiveness of a passive horizontal drain for reducing groundwater mounding and drawdown at such a large scale is unproven, and a number of engineering challenges associated with the drain have been identified.**
- **All expert witnesses in the area of groundwater engineering stated that it should be feasible to mitigate the impacts of the rail trench at Edithvale to the required degree, although the final engineering solution may not necessarily be a passive horizontal drain. The IAC accepts this advice.**
- **The passive horizontal drain (or alternative mitigation works) should include redundancy in case the drain (or alternative works) fails to operate as expected.**
- **The passive horizontal drain will require ongoing inspections and maintenance to operate effectively.**

Edithvale and Bonbeach Level Crossing Removal Projects ☒ EES Inquiry and Advisory Committee Report ☒ 30 July 2018  
Page 42 of 156

On page 43: **Monitoring and mitigation**

- **Monitoring and mitigation are important because of uncertainties relating to the groundwater modelling and the performance of the passive horizontal drain at Edithvale.**
- **Additional ‘baseline’ monitoring of existing conditions is necessary to refine the groundwater modelling to provide more detail about the local groundwater conditions in the Project areas and their relationship to groundwater conditions at the wetlands. This should include additional investigation boreholes in the Project areas and transects of boreholes between the Project areas and at the wetlands. This additional work is necessary to provide a sound basis for developing the design of the rail trenches and mitigation measures and to ensure they comply with criteria established through the EPRs.**
- **Groundwater monitoring after project completion will be necessary for a number of reasons, including:**
  - **to test and confirm predictions regarding impacts of the rail trenches and incorporated mitigation measures on groundwater levels on groundwater levels, and assist in the monitoring of secondary impacts (e.g. impacts on wetland ecology or foreshore vegetation).**
  - **to confirm the ongoing effectiveness of incorporated mitigation measures (e.g. passive horizontal drain) and inform their operation and maintenance.**
  - **to assess the need for additional mitigation measures.**
- **The IAC recommends that the Groundwater Monitoring and Mitigation Plan be implemented for an initial period of ten years. A review should be undertaken to the satisfaction of EPA, DELWP, Council, Melbourne Water and relevant water authorities to assess findings at that time and determine future monitoring and mitigation requirements. The IAC expects that, as a minimum, some degree of ongoing monitoring of groundwater levels will be required to continue indefinitely for operational purposes, including maintenance of the mitigation works (the passive sub-surface horizontal drain or alternative mitigation works) at Edithvale.**
- **There is keen public interest in the potential impacts of the Projects on groundwater and GDEs. The IAC recommends that the results of the groundwater monitoring should be made publicly available in a timely manner.**

**Changes to EPRs**

- **The IAC recommends changes to EPRs GW1, GW2, GW3, GW4 and GW5 to reflect these findings. The IAC’s preferred version of the EPRs is shown in Appendix E.**

On page 69, Section **10 Impacts on Wetlands**

### **10.2 What are the risks? (P. 69)**

The potential impacts on the wetlands arising from the Projects are consequences resulting from groundwater mounding and/or water quality impacts, which have been discussed in previous chapters (Chapters 6, 8 and 9). Such impacts may arise solely due to the Projects, or due to the changes in groundwater levels or quality exacerbating or accelerating the effects of climate change and/or sea level rise. The key issues are:

- **Loss or degradation of native vegetation in the Edithvale Wetlands, Edithvale Common and/or Wannarkladdin Wetlands, including threatened vegetation species and communities, potentially leading to a reduction in the extent of native vegetation in Victoria**

- Loss or degradation of fauna habitat (including waterbird habitat) the Edithvale Wetlands and/or Wannarkladdin Wetlands
- Loss or degradation of wetland habitat at the Edithvale Wetlands and/or Wannarkladdin Wetlands, resulting in exacerbation of a threatening process listed under the FFG Act
- Loss of wet grassland / mudflat habitat that is significant for listed migratory and threatened bird species
- Impacts on listed migratory and threatened bird species, including the Australasian Bittern *Botaurus poiciloptilus*, Curlew Sandpiper *Calidris ferruginea*, Sharp-tailed Sandpiper *Calidris acuminata* and Latham's Snipe *Gallinago hardwickii*
- A change in the Ecological Character of the Edithvale-Seaford Wetlands Ramsar Site, potentially exceeding the Limits of Acceptable Change for Critical Components, Processes and Systems
- Failure of the Edithvale-Seaford Wetlands to continue to meet the criteria for listing as a Ramsar site.

On page 88: **Friends of the Edithvale & Seaford Wetlands** proposed the following changes to EPR FF8.

- The monitoring and mitigation plan should be extended to the Wannarkladdin Wetlands, which are an important part of the wetland complex of the former Carrum Swamp, even though they are not part of the Ramsar site.
- The period of monitoring should be for a minimum of 10 years because the response times for the groundwater system are unknown.
- The groundwater monitoring component of FF8 should cover the whole local groundwater system between the Project areas and the wetlands, rather than being confined to areas within and around the wetlands as proposed in the EES
- The plan should include criteria for determining whether changes in groundwater levels or quality along the transects from the Project areas to the wetlands are attributable to the Projects
- Clear criteria relating to groundwater levels and quality should be established for determining triggers for response.

In a subsequent submission made in response to Document 49 (Environmental Performance Requirements LXRA Version 3, 15 June 2018), Friends of Edithvale Seaford Wetlands emphasised the importance of the monitoring for providing an early warning of any impacts at the wetlands. They submitted that:

*What is needed is an early warning system from the monitoring network of bores that extend along the edge of the projects and then along 3 West to East Transects (2 for Edithvale and 1 for Bonbeach) between the projects and Centre Swamp Drain to indicate potential adverse changes early.*

On page 90, Section 10.9 **Findings** (P.90)

The IAC makes the following findings in relation to the impacts on the Edithvale or Wannarkladdin Wetlands:

- The IAC considers that the key findings of the EES in relation to the Edithvale or Wannarkladdin Wetlands are reasonable based on the available information but notes limitations to the risk pathways considered and uncertainties in relation to changes in groundwater regime and their implications.
- The hydrology of the wetlands has a critical influence on their ecological character. Changes in hydrology also have the potential to affect waterbirds, including migratory threatened species.
- Changes in salinity and water quality, including pH, can also significantly affect wetland flora and fauna through direct toxic effects, changed chemical processes and loss of habitat.
- The risks to the wetlands arising from the Projects are secondary impacts that would occur as a consequence of changes in groundwater levels and flows, groundwater quality or surface water quality.
- The groundwater modelling undertaken for the EES indicates that significant groundwater mounding caused by the Projects is unlikely to extend to the Edithvale or Wannarkladdin Wetlands, particularly after mitigation measures (passive sub-surface horizontal drain) are applied at Edithvale. Minor changes in baseflows and wetland water levels may occur, but these are not predicted to significantly alter wetland habitat extents.
- If the groundwater modelling is correct, then no changes in wetland ecology would occur as a result of changes in groundwater levels. However, as discussed in Chapter 6, there are uncertainties regarding the groundwater modelling, leading to uncertainty regarding likely impacts on wetland ecology.
- To address these uncertainties, it is recommended that the EPR FF8 Monitoring and Mitigation Plan be developed and implemented. The IAC preferred version of EPR FF8 is shown in Appendix E.