

# TEER Program – Sediment Management Report Review

1	Summary
	<ol style="list-style-type: none"> <li>1. The TEERP Report presents a comprehensive pre-feasibility level evaluation of the sediment management options for the upper reaches of the Tamar estuary. Fifteen different options, (within 9 option classes) are assessed. The options range from a “do nothing” approach to the large scale modification of the estuary through construction of a total exclusion barrage 50 kms downstream of Launceston. Competing options are assessed in terms of their effectiveness in delivering bathymetric improvements (increased channel depth and reduced visible mudflats), their feasibility (technical, legislative, infrastructure and safety), capital and operational costs, and the trade-offs with flood risk and environmental and social impact. The report is couched in the context of contemporary estuary management practice and the post 1806 history of human intervention. Original data sources and key reports are cited in many instances, and have either been incorporated in additional analysis, or discredited in some cases.</li> <li>2. As such the report should be adopted as the new base document to inform estuary sediment management practice. That doesn’t mean the report is correct in all details, nor does it mean that it shouldn’t be critiqued and revised as improved knowledge is brought forward. Given that the report is broadly a pre-feasibility level document we should not be surprised if major changes in some areas are required, given the complex behaviour of this estuary, and the difficulty of modelling some aspects reliably at pre-feasibility level.</li> <li>3. This review assumes that a minimum level of bathymetric improvement between Charles Street Bridge and the Trevallyn Tailrace, and in the Yacht Basin is required, and that this minimum level of functional performance is defined by:             <ol style="list-style-type: none"> <li>a. Navigable channels, and all tide shore access for all existing commercial and recreational uses</li> <li>b. Large decrease in visible mudflats (at least 30%)</li> </ol> </li> <li>4. The only options which offer this level of bathymetric improvement are the small and large Tamar Lake concepts, both of which offer solutions which exceed the bathymetric limits, by establishing a non-tidal freshwater lake with an operating water level approximately 1 metre below current high tide.</li> <li>5. The large wetland restoration concept, provided it can be achieved without floodplain excavation, offers the required level of bathymetric improvement in all but the Yacht Basin. As such it is “the best that can be achieved” without dredging the estuary in perpetuity, diverting the Trevallyn Power Station discharge, or converting the upper estuary into a freshwater lake.</li> <li>6. This review finds the Tailrace Canal concept to potentially offer additional bathymetric improvement to that associated with large wetland restoration, despite the negative assessment of the TEERP Report. It is acknowledged that major concerns exist regarding             <ol style="list-style-type: none"> <li>a. the influence of the additional tidal prism created by the canal on the bathymetry of the Yacht Basin and to a lesser extent of Home Reach</li> <li>b. The capacity of the Trevallyn Power Station operational regime to meet the minimum flows required for Tailrace Canal tidal prism development</li> </ol> </li> </ol>

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- c. The absence of any prefeasibility assessment of the physical canal infrastructure involved, and its impact on existing transport, hydro power generation, building and public recreation assets, and on public safety, flood and riverbank stability risks.
- d. Capital and operational costs; and project economics
- e. The visual impact of a relatively large civil engineering structure on Launceston's urban form.

Kidd's first order modelling predicts that the Tailrace Canal concept would remove 263 000 M<sup>3</sup> of silt from Home Reach; compared to the 168 000 M<sup>3</sup> estimated to be removed between Charles St Bridge and the Tailrace by the tidal prism influence of a new 50 000 M<sup>3</sup> tidal lake proposed on the North Esk at Hobbler's Bridge.

If Kidd's first order analysis was to be validated by 3D hydrodynamic modelling; then an upper estuarine strategy combining a large wetland restoration project with a Tailrace Canal flow diversion might realistically deliver the minimum bathymetric functionality requirements adopted by this review for the estuary between the Charles Street Bridge and the Tailrace, including the Yacht Basin. It must be noted that even if this was the case, the caveats listed in 6b-6e above are very significant to the extent that this concept is highly unlikely to be feasible.

Furthermore, given that the tidal prism contribution to Tailrace canal is quite small (less than 15%) relative to the average daily S Esk River flow, it might actually be better to decommission the Trevallyn Power Station and divert Lake Trevallyn down the Cataract Gorge. Hydro Tas would incur opportunity costs associated with lost power production (say 500 GWh/year from 100MW of installed capacity) ... but the power station penstock could be repurposed as part of a process water supply pipeline to Bell Bay, and the power station capacity replaced with wind farm or pumped hydro assets as part a regional scale natural solution focussed Tamar Estuary rejuvenation project.

- 7. Both the Large Wetland Restoration concept and the two Tamar Lake concepts involve very high capital costs, indicatively estimated at \$250M and \$500M respectively. Capital costs for the Tailrace Canal are likely to be of a similar order. Operational costs can be expected to be higher for Tamar Lake, especially when hydro power generation opportunity costs are factored in. Limited pre-feasibility level economic analyses have been undertaken (at a project and regional economic level) for the Tamar Lake concept by the proponent and indicate positive outcomes in both instances. No economic analysis has been undertaken for the large wetland restoration concept.
- 8. It is surprising that the TEERP Report excludes project economic and regional economic assessment of the larger projects. It is unlikely the Tamar Lake, Tailrace Canal or Large Wetland Restoration projects would attract private sector investment. Competition for public funds from competing projects is intense at all levels of government; requiring a robust public benefit economic case to be demonstrated. Given the scale of investment required, each of these concepts need to demonstrate significant regional and state economic benefit, far beyond the local benefits associated with more effective upper estuarine sediment management. The TEERP report should be substantively revised to include this important assessment criteria.

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	<p>9. At the pre-feasibility level of analysis conducted to date</p> <ul style="list-style-type: none"> <li>a. the Large Wetland Restoration approach is attractive as it restores historical natural processes which, over time, can be expected to correct previous and poorly conceived human intervention and ongoing neglect. It will potentially also bring substantial environmental benefits, and perhaps economic benefits in the form of carbon credits. The project concept does, however, fail to deliver the minimum bathymetric functionality required by this review, without the inclusion of the Tailrace Canal infrastructure component (or decommissioning Trevallyn Power Station / re-diversion of Lake Trevallyn down the Cataract Gorge). Additionally, a first order calculation (within this review) values carbon credits from 650ha of North Esk saltmarsh at less than \$40K/year; useful revenue but far too small to recover the much larger capital investment.</li> <li>b. Without a greater regional problem to solve, the Tamar Lake solutions remain an over specification. The currently identified economic benefits are not large enough to justify the scale of the solution and the potential environmental impacts. It is surprising that no consideration has been given to the potential economic benefits associated with utilising:             <ul style="list-style-type: none"> <li>i. the freshwater lake to deliver industrial process water to Bell Bay, and</li> <li>ii. the barrage to defend Launceston against climate change driven sea level rise</li> </ul> </li> </ul> <p>Economic analysis should be required to demonstrate a project Benefit Cost Ratio of 3 to 4 and an annual Gross State Product contribution exceeding 1% so that the public benefits associated with the investment are unquestionable.</p> <p>Potential show stopping risks associated with lower estuary sedimentation below the barrage, and any extreme non-offsetable environmental impacts also need to be positively resolved for the concept to remain a feasible option</p>
<b>2</b>	<b>Key Questions for TEMT (and its Independent Authority successor)</b>
	<ol style="list-style-type: none"> <li>1. Will TEMT (and its IA successor) adopt the levels of bathymetric performance identified in 1.3 above as the minimum level of functional performance (for channels and visible mudflats at spring low tide water level) for any estuary improvement project? NB- for the purposes of this question the river edge infrastructure and environmental works proposed in the draft TEMT vision are classified as shore-based works rather than an estuary improvement project.</li> <li>2. What scale of North Esk floodplain wetland restoration would deliver the minimum level of functional performance referred to in 2.1 above? .. and would silt raking be introduced to accelerate establishment of the new bathymetric regime downstream of the Charles Street bridge following restoration of the wetlands .. rather than waiting for future flood events to scour the existing channel and mudflats below the new equilibrium level?</li> <li>3. How would the minimum level of functional performance be delivered in the Yacht Basin under a wetland restoration approach? Would the State Government increase its aspiration for Tamar Estuary rejuvenation by incorporating the decommissioning of</li> </ol>

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	<p>Trevallyn Power Station and re-diversion of all South Esk River flows down the Cataract Gorge .. offset by replacing the existing generation capacity and repurposing the penstock asset as outlined in 1.6 above?</p> <p>4. Will TEMT (and its IA successor) rule out maintenance dredging (except silt raking) as a bathymetric performance solution except to deliver</p> <ul style="list-style-type: none"><li>a. the current election commitment,</li><li>b. accelerated bathymetric profile development associated with a large wetland restoration solution, and</li><li>c. long term all tide channel access to existing commercial and recreational users</li></ul> <p>and commit to ensure that raking is permissible for these applications under an environmental and health risk management plan established for that purpose?</p> <p>5. Will TEMT (and its IA successor) reconsider evaluation of a regional scale freshwater lake solution if it becomes apparent that wetland restoration / maintenance dredging are incapable of delivering the minimum level of functional performance referred to in 2.1 above, subject to the likely economic and environmental benefits and costs justifying such reconsideration? In order to do this would a commitment be made to a similar approach to that taken for the Thames Estuary (<a href="#">Thames Estuary 2100: 10-Year Review monitoring key findings - GOV.UK (www.gov.uk)</a> ) ?</p> <p>6. What is the estimated capital cost of a pipeline constructed between Launceston and Bell Bay to supply the long-term process water demand of the Bell Bay heavy industrial zone .. and by how much could this be offset by repurposing the Trevallyn Power Station penstock as outlined in 1.6 above?</p>
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