

# PROPOSED LAUDERDALE QUAY CANAL ESTATE DRAFT INTEGRATED IMPACT STATEMENT

## **Elaboration of Submission 540 to the Resource Planning and Development Commission by Axel von Krusenstierna**

As requested by the Commission this report provides further explanation and detail of my earlier submission and should be read in conjunction with that submission.

In this report I will elaborate on my comments on two sections of the Walker Corporation Draft Integrated Impact Statement;

1. the Construction Environmental Management Plan (CEMP) (Appendix X2)
2. the Operational Environmental Management Plan (OEMP) (Appendix X3).

and provide further comment on two other important issues in the DIIS:

3. the proposed habitat loss offset strategy (Appendix W)
4. the impact of sea level rise.

My background and expertise are explained in my submission. As noted in my submission I believe the canal estate proposal should be rejected due to its adverse impact on important bird habitat, the increased risk it poses of major pollution in Ralphs Bay, its blocking of the scenic vistas across Ralphs Bay from South Arm Road, and the disruptions to the community that would be caused by the inordinately long construction period.

## **Comments on the Lauderdale Quay Construction Environmental Management Plan (Cardno Pty Ltd, 2009)**

Although not stated, the Construction Environmental Management Plan (CEMP) included in the DIIS appears to be only a brief outline and a lot more detail will need to be added before it could be considered adequate for the management of environmental impacts during construction and given final approval. The further details required include:

- all statutory obligations, permit requirements and conditions of approval for the construction phase
- more detail on specific personnel who will be responsible for particular actions involved in implementing the CEMP
- minimum levels of expertise for those involved in implementing the CEMP
- details of all the environmental impact mitigation measures that will be implemented including their minimum performance criteria, what materials will be used, when and where they will be implemented, and an inspection and maintenance program
- detailed recording and reporting procedures to cover installation, inspection and maintenance of environmental safeguards including pro forma record sheets
- detailed procedures for auditing, issuing, actioning and following up on non compliances
- realistic, detailed and auditable performance criteria for all environmental impact mitigation measures; i.e. criteria that set measurable criteria for determining non compliance
- details of remedial actions that would be undertaken should a non compliance be detected, this should include non compliances that require works to cease and where other authorities need to be informed.

It was also noted that the CEMP does not appear to cover work on the offsets proposed in the DIIS and does not indicate where the site compound, site office and any other support facilities for the project would be located prior to completion of the perimeter bund. Substantial environmental impacts could occur during construction of private houses and commercial buildings within the proposed development. These risks have not be addressed in the CEMP, OEMP, or elsewhere in the DIIS.

Apart from these general comments applicable to the whole CEMP, some brief, but not exhaustive, comments on specific sections of the CEMP are given below.

### **Page 6, Paragraph 2**

The claim that maintenance dredging would only be needed once every 50 to 60 years is ludicrous considering the previous canal dug through the Ralphs Bay sand flats in the late 1920s had almost

completely silted up by 1960 (see figure 4 in Appendix H of the DIIS) and is now no longer visible. The evidence indicates that maintenance dredging will be needed relatively frequently, particularly after major storm events.

#### **Page 11, Section 3.8, Evaluation of Compliance Manual**

This section proposes internal auditing of the Environmental Management System (EMS) and its components but states that external audits “may be conducted during operations for purposes of certification of systems or for other means” Regular internal audits are important for monitoring the implementation of an EMS but regular audits by a qualified external auditor are essential to give the community confidence that environmental safeguards are being successfully implemented and non conformance corrected. The results of both internal and external audits should be made available to the community to ensure a transparent process.

#### **Page 14, Section 5, Roles and Responsibilities**

This section appears to nominate Clarence City Council as the body that would have oversight of the EMS and CEMP, however Council is not provided with any mechanism to independently evaluate implementation of environmental safeguards or to require Walker Corporation or its contractors to undertake remedial action. The system set up in the EMS and CEMP is essentially one of self-regulation. To ensure community confidence an external body should be given an oversight role, including a mechanism to determine if any non-compliances have occurred and the power to require remedial actions be carried out.

#### **Page 14, Section 5.3, Roles and Responsibilities – Contractor**

Point b requires the contractor to appoint an Environmental Management Officer but does not state what the minimum qualifications of this person should be. It is also important to specify what the responsibilities and powers of the Environmental Management Officer are, otherwise this could just become a token position given to someone without the qualifications and experience for the position, or the power to require environmental safeguards to be implemented, harmful actions to cease, and remedial actions to be undertaken.

#### **Page 16, Section 6.1, Element: Pre Civil Works Water Quality Monitoring**

Adequate baseline data is crucial for impact monitoring. The barest minimum of data should be monitoring through all four seasons of the year. As well as monitoring surface water, water quality monitoring of the bottom of the water column is required. After all it is the quality of the water at the bottom of the water column that will affect most marine organisms, particularly the spotted handfish, not the surface water.

It is not clear why tests for dissolved oxygen and temperature have been included in the tests for groundwater as these have no effect on groundwater quality. Groundwater quality monitoring should include testing for common pollutants such as hydrocarbons, heavy metals and nutrients.

#### **Page 19, Section 6.2, Element: Community Awareness**

I can not see how a construction program that would take more than 20 years (including residential and commercial buildings) can be described as having “short term impacts on public amenity” and the performance indicator of “nil community complaints received during construction works” is ridiculous for a project of this size located close to residential areas. A more realistic objective for this element should be something like: – All complaints received will be promptly responded to and actioned. A reasonable and auditable performance indicator would then be: - All complaints responded to, indicating action to be taken, within 24 hours and any actions required implemented within one week.

#### **Page 20, Section 6.3, Element: Earthworks Management**

It is assumed a lot more specific detail of the environmental safeguards that would be employed will be added to this section before any approval is given. In order to meet the objective to “minimise the environmental impact associated with the construction works” the performance indicators must include measurable limits to all the likely impacts and there must be a monitoring and an audit program to determine if these limits have been complied with. The second performance indicator listed in this section appears to be an action rather than a performance indicator.

#### **Page 22, Section 6.4, Element: Dredge Management**

This section at least has an auditable performance indicator but a detailed monitoring and reporting program is required (when, where, how, by whom) as well as specific performance criteria for the protection measures (e.g. what current velocities and wave heights the sediment curtain would need to withstand) and an inspection and maintenance program.

It was noted that the second task on Page 23 requires that only sand dredged from the navigation channel would be utilised for construction of the outer bund. Figure 13 of Appendix H of the DIIS shows that there is only a thin veneer of sandy material (about 0.5 m thick) where the navigation channel will be dug, clearly an inadequate quantity for forming the containment bund. If this task is to be complied with a process to separate the sand from the finer sediments prior to emplacement on the outer bund should be included as well as details of how the quality of the emplaced material would be monitored and where the discarded fines would be disposed of.

Regarding the last task on Page 23, water should only be released back into Ralphs Bay when it has been tested and found to meet water quality criteria not merely after it "has passed through three settlement ponds".

Corrective actions listed for the first task on Page 24. If the sediment curtain is leaking or damaged surely dredging operations should cease immediately until it is repaired – not continue for another 12 hours.

Surely a sediment curtain would be installed before removal of the outer bund? (second last and last task on Page 24).

Emplacement of the outer bund at the beginning of the project is a high risk procedure as both waves (over 1 m high regularly observed) and tidal currents, particularly when exacerbated by wind and wave set up, could disperse even relatively coarse material in the bunds over a wide area of the bay. As the gap in the bund wall narrows tidal current flow through the gap will increase further exacerbating the problem.

The period of at least 3.5 years that the bund will be in place means that it will be subjected to a number of major storm events, all with the potential to severely erode, overtop and breach the bund wall. Basically a lot more time for something to go wrong than is necessary. The wind generated waves in Ralphs Bay have eroded the northern shore of the bay to form cliffs up to about 5 m high. Such condition make the proposed "earth bund" untenable.

#### **Page 25, Section 6.5, Element: Erosion and Sediment Control**

In the corrective action/monitoring for the first task a failure in erosion and sediment controls should require any works in the area that may cause erosion and sediment runoff to cease until the controls are repaired. Prevention of erosion needs to be proactive not reactive, so protective measures should be taken to prevent scouring in drains, not just implemented after scouring has occurred. Similarly all finished soil surfaces should be stabilised within a short (and specified) time, not just when there is evidence of erosion. Note also that specification like "as soon as practical" or "as soon as possible" can not be audited and should never be used in a CEMP. A specific time period should always be specified so that implementation of the control measure can be audited.

A facility to removed mud and dirt from vehicles leaving the construction site is required so that dirt and mud is not tracked onto public roads. Road sweeping equipment needs to be kept on site in case protection measures are not effective or there is accidental spillage onto public roads.

#### **Page 27, Section 6.6, Element: Surface Water Quality**

As noted before, it is not the quality of the surface water around the proposed development that is important but the quality of the water at the bottom of the water column as this will have the most effect on marine organism. For example sediment laden water is denser than clear water and will 'flow' along the bottom without affecting surface water quality.

Regarding the performance indicator, any water discharged into the surrounding natural waters must meet the quality criteria or be a non compliance. To specify that water can be discharged if it does not worsen existing conditions could allow on going discharge of polluted water where the "existing conditions" are waters polluted by a previous discharge. The developer's responsibility to prevent pollution must be absolute not relative.

An absolute limit to turbidity needs to be specified and applied to any discharge irrespective of conditions. Visual monitoring of turbidity during dredging is inadequate as turbid water will generally flow along the bottom and will not be easy to detect visually. A device that can monitor turbidity levels at different points in the water column from the bottom to the surface is required.

I fail to see why litter/gross pollutants less than 50 mm in diameter are considered to be less polluting than those above. Small sized litter/gross pollutants can more easily be ingested by marine organism and can travel a lot further. The target here should be no release of litter/gross pollutants.

Discharge limits should also be set for the following water quality parameters:

Suspended solids

Biological oxygen demand

Total dissolved solids

Heavy metals; at least, mercury, cadmium, zinc and lead

Other metals; iron and aluminium

Nutrients; total nitrogen, total phosphorus

Total hydrocarbons

Chloride and sulphate

These are generally the standard water quality parameters tested in water discharged from major construction sites in NSW.

**Page 31, Section 6.7, Element: Groundwater Quality**

As noted before, ground water quality parameters should include limits for hydrocarbons and heavy metals. Remedial actions that will be taken if groundwater exceeds the limits set in Table 3 needs to be specified.

**Page 33, Section 6.8, Element: Acid Sulphate Soil Management**

The performance indicator of “remediation of acid waters” is a bit late as environmental damage would already have occurred. Remediation of any acid sulphate containing sediments should occur before they are used for the construction of any artificial island. Once the material is emplaced and allowed to oxidise remediation becomes very difficult with a reduced likelihood of success.

**Page 34, Section 6.9, Element: Contaminated Land**

The performance indicator for this element must specify the maximum allowable levels of all the contaminants likely to occur. The options for disposal of contaminated material will obviously depend on the nature of the contamination. The CEMP should specify what contaminants will be tested for, where and when, and how different types of contaminated materials would be handled and disposed of. It should also be noted that many soil contaminants can not be detected by visual inspection so samples would need to be taken for laboratory testing.

**Page 35, Section 6.10, Element: Terrestrial Flora and Fauna Management**

The third paragraph in this section is confusing. First it mentions that removal of vegetation along the South Arm Road and on the spit is required, but then goes on to talk about the need for controls to prevent unintended disturbance. If all the vegetation is to be removed in these areas what has been identified for retention?

Surely the third objective for this element should apply to all weeds and pest animals not just declared weeds and pest animals that are new to the site. Precautions are required to prevent the spread of all weeds, declared and environmental, and all pest animals, including those that already occur on the site.

Two plans referred to in this section, a Habitat Enhancement Plan and a Weed Management Plan have not been included in the DIIS.

**Page 41, Section 6.11, Element: Waders and Shore Birds**

The fifth performance indicator in this section is a task rather than a performance indicator.

This section needs to set out criteria against which disturbance of waders and shorebirds can be assessed, a process for making the assessment and a measurable limit to the disturbance, otherwise it will not be possible to determine if disturbance has been minimised.

**Page 44, Section 6.12, Element: Aquatic Ecology Management**

If “no degradation of spotted handfish habitat” is used as a performance criteria the current extent and condition of this habitat would need to be assessed prior to the commencement of construction and regular monitoring of habitat conditions carried out during construction.

**Page 47, Section 6.13, Element: Mosquito and Biting Midge Management**

The parameters and procedures for the proposed mosquito monitoring program need to be defined as well as measurable criteria that would trigger remedial action.

**Page 50, Section 6.14, Element: Air Quality**

The dust pollution controls proposed in this section appear to be mainly reactive e.g. monitoring would only be undertaken in response to a complaint and water trucks would only be deployed when dust is

visible for longer than 15 minutes. Again, the developer's responsibility to avoid air pollution should be absolute, not relative to whether it generates a complaint, so a more proactive approach to controlling air pollution is required. Dust monitoring devices should be in place and regularly checked for the duration of the works.

A time frame should be given for cleaning up spillages of materials on public roads. The "as quickly as practicable" stated in the CEMP can not be audited and is meaningless as a performance indicator.

**Page 53, Section 6.15, Element: Greenhouse Gas Abatement**

Some measurable limits to greenhouse gas emissions needs to be set so this element can be audited. This section states that fuel and energy consumption would only be monitored annually. This does not indicate a strong commitment to reducing fuel and energy consumption. Monthly monitoring would be more appropriate.

**Page 55, Section 6.16, Element: Noise and Vibration**

Noise monitoring should be proactive rather than reactive. A complaint about noise and vibrations should be considered a failure of controls, not a trigger for monitoring. A monitoring program should be included in the proposed noise management plan to ensure the limits set in the CEMP are not exceeded.

Pre-dilatation surveys should be carried out if vibration producing machinery is going to be used close to nearby structures.

**Page 58, Section 6.17, Element: Waste Management**

The performance indicators for this element should include a waste recycling target that can be audited. The tasks should include housekeeping provisions such as awareness training, regular site inspections and regular clean ups.

**Page 60, Section 6.18, Element: Dangerous and Hazardous Materials**

Storage of some hazardous materials may require special permits and the CEMP should indicate the materials likely to be used on site that require permits or that can only be used by personnel with appropriate training/accreditation. The tasks list should also include instructing workers in the safe handling and storage of hazardous materials. Auditing of dangerous and hazardous materials storage areas should be monthly rather than 6 monthly.

The CEMP should also detail what spill containment and clean up equipment would be kept on site, and procedures for reporting and spills or emissions of hazardous materials. Spill containment and clean up equipment should be able to control spills both on land and water.

**Page 62, Section 6.19, Element: Cultural Heritage Management - Indigenous**

The performance indicator should be changed to read – No destruction or damage to any known Aboriginal heritage sites without a permit issued under the Aboriginal Relics Act, 1975.

The staff member appointed as Aboriginal Heritage Officer for the project must be approved by the Tasmanian Aboriginal Land and Sea Council.

**Page 64, Section 6.20, Element: Cultural Heritage Management – Non Indigenous**

No comments.

**Page 66, Section 6.21, Element: Traffic**

This section should include the training and accreditation requirements of personnel undertaking traffic control and auditable limits on hold ups that may be caused by vehicle and machinery movements or road works. This element should also specify the maximum time that access to any property would be cut. Residents must be consulted at least two weeks before any planned disruption or change to property access.

**Page 68, Section 6.22, Element: Visual Amenity**

Site housekeeping should include regular training through inductions and tool box meetings as well as scheduled inspections and clean ups.

**Page 69, Section 6.23, Element: Navigational Safety**

Vessels used during construction must display the navigation lights and other warnings required by boating regulations. Any navigation hazards created during construction must be appropriately marked.

**Page 70, Section 7.1, Element: Soil and Water Management**

The comments on Section 6.6 also apply to this section. As the works covered by this section would be undertaken after the canals have been flooded, additional water quality monitoring points would need to be established in the canals.

Rapid revegetation of bare soil surfaces is essential for effective soils and water management. Time frames for revegetation (e.g. within a week of cessation of works on an area more than 0.5 ha in extent) should be set so this process is rapid and can be audited.

**Page 73, Section 7.2, Element: Traffic**

The comments on Section 6.21 apply to this section as well.

**Page 75, Section 7.3, Element: Flora and Fauna Management**

The comments on Sections 6.10, 6.11, 6.12 also apply to this section.

**Page 76, Section 7.4, Element: Environmental Nuisance**

The comments on Sections 6.14, 6.15 and 6.16 also apply to this section.

**Page 78, Section 7.5, Element: Navigational Safety**

The comments on Section 6.23 also apply to this section.

**Page 79, Section 7.6, Element: Waste Management**

The comments on Section 6.17 also apply to this section.

**Comments on the Lauderdale Quay Operational Environmental Management Plan (Cardno Pty Ltd, 2009)**

As in the Construction Environmental Management Plan (CEMP) the Operational Environmental Management Plan (OEMP) included in the DIIS appears to be only a brief outline and a lot more detail would need to be added before it could be considered adequate for the management of environmental impacts following construction and given final approval. In particular a lot more detail is required on how the proposed Lauderdale Quay Management Service (LQMS) would function, including:

- how would it be funded and what level of funding would it require to do its job
- how many personnel and what level of expertise
- what other resources would it require
- who would be responsible for ensuring the LQMS is doing its job
- what powers would it have and will they be adequate for it to carry out its assigned role in the OEMP (for example, would the LQMS have the power to enter private property to check for breaches of the OEMP)
- there is no indication that Clarence City Council or other authorities have agreed to the responsibilities that would be assigned to them by the OEMP or have the resources to carry them out.

It is doubtful that the OEMP could be successfully implemented on private property within the proposed development which is likely to be the main source of pollutants during the operational phase. Compliance would therefore rely on the goodwill and willingness of future property owners, i.e. the LQMS would not be able to do much more than encourage them to comply.

Neither the CEMP or the OEMP cover the construction of buildings within the proposed subdivision when there will obviously be a major risk of environmental impacts. This is a major omission and needs to be thoroughly addressed in the IIS. Walker Corporation states that they will have no control over the final built form despite all their glossy images of the final form. It is not clear in the DIIS who would have control over the pollution, litter and other environmental damage that is likely to occur during the building construction phase of the development. Large amounts of litter are commonly left around suburban building sites. Factor in the strong winds that occur regularly at Lauderdale and you have large amounts of litter being blown into the waterways which is then flushed out into Ralphs Bay.

No procedure for auditing the OEMP is included and in its current form it could not be successfully audited. For a successful audit performance indicators need to be quantified, regular monitoring needs to be carried out and records kept. However, if there is no mechanism for taking remedial action for non

conformances on private property then there is not much point carrying out an audit. In short, a OEMP that can't be effectively audited or enforced is not much use.

I have not been through the OEMP in the same level of detail as the CEMP however some brief, but by no means exhaustive, comments on the OEMP are given below.

#### **Page 3, Section 1, Introduction**

The statement in paragraph 3 that the proposed canal estate represents "approximately 3% of the total area of Ralphs Bay" is correct but misleading as Ralphs Bay is a relatively large body of water and the impact of the proposed development would affect a particular habitat in the bay i.e. the intertidal zone. It would be more meaningful to state the percentage of the intertidal area in Ralphs Bay that would be affected by the proposed development i.e. approximately 15%.

#### **Page 25, Section 5.1, Element: Water Quality**

Monitoring of water quality and pollution incidents should be pro-active through frequent monitoring and inspections, reliance on "complaints of inappropriate practices" as specified in the OEMP does not seem an effective method for preventing environmental pollution and would require residents to do in their neighbours. It is also a reactive rather than a proactive approach.

There is no information on how corrective action would be taken, for example, would the proposed LQMS have the power to carry out remedial works on private property within the development? Who would fund the costs of clean ups?

#### **Page 32, Section 5.5, Element: Flora and Fauna Management**

The two performance indicators in this section are meaningless, the first because it cannot be monitored and the second because "appropriately controlled" is not defined.

#### **Page 34, Section 6.1, Element: Stormwater Management**

The performance indicator of "nil release of contaminants to waters" implies that the proposed stormwater pollutant removal devices are capable of removing all pollutants. This is clearly ridiculous and more realistic targets need to be set.

#### **Page 42, Section 6.5, Element: Dangerous and Hazardous Materials**

The first performance indicator refers to "works" but it is not clear what these are. The second needs a clear definition of "environmental harm".

The corrective action/ monitoring instruction for the first task does not appear to relate to the stated task.

#### **Page 48, Section 7.1, Element: Water Quality**

No Water Quality Targets have been set in Table 6 for temperature, salinity, specific conductance or secchi depth.

The second task refers to a 'no release policy' within the marina, however there is no indication if this would also apply to vessels at private births within the proposed development and how this would be enforced.

## **Climate Change and Sea Level Rise**

The proposed design level of 2.5 m AHD is well below the current accepted minimum to cope with sea level rise. The South Australian government "Recommended minimum site levels of 2.7 m AHD and floor levels of 2.95 m AHD for development that is not exposed to wave run-up and 3.0 m AHD and 3.25 m respectively for development that is exposed to wave run-up." (Planning SA, 2005, Assessment Report for the Environmental Impact Statement for the Ceduna Keys Marina & Community Centre Proposal). The allowance of 0.5 m for sea level rise seems rather low as predictions now range up to over 0.9 m and at least this level should be adopted to ensue some margin of safety. For example, the NSW Government Draft Sea Level Rise Policy Statement predicts a rise of 0.9 m by 2100 and that sea level will continue to rise beyond that date, and the Victorian Coastal Strategy 2008 plans for a sea level rise of not less than 0.8 m by 2100.

The 2.5 m design level proposed by the developer is therefore a high risk strategy given the latest predictions of sea level rise and it is the community, and particularly future residents in the proposed development that would suffer the consequences. The low design level proposed for the development is almost certain to result in periodic flooding during storm surges. This would have major environmental consequences including:

- flooding and displacement of sewage out of the sewerage system

- damage to underground services (electricity, telephone etc)
- displacement of anything that will float into Ralphs Bay
- death of private and public landscape plantings due to inundation by salt water
- health and safety risks for residents
- damage to private and public property.

## Proposed Environmental Offsets

### *East Marsh Lagoon and Racecourse Flat*

The proposal to facilitate increased tidal inundation of East Marsh Lagoon and Racecourse Flats as an “offset” ignores the fact that this area has been cut off from tidal inundation for a long enough for the flora and fauna in this area to have adapted to the current hydrological regime. Rather than being “degraded” the flora and fauna of the area has changed and adapted to the current hydrological conditions and the area is now confirmed habitat for three State listed threatened species (Chevron looper moth, *Amelora Acontistica*, Narrow-leaf blown-grass *Lachnagrostis punicea ssp. Filifolia* and golden dodder *Cuscuta tasmanica*) and suitable habitat for a third (salt marsh looper moth *Dasybela achroa*). Allowing this area to be more frequently and more extensively flooded by seawater will cause considerable damage to the existing environment, as well as a potential flooding risk to houses around the edge of Racecourse Flat. It should be noted that this area is not owned by Walker Corporation but is a conservation reserve owned by Clarence City Council.

Destroying existing habitat to create a different habit can not be considered an “offset”. Removal of the landfill in the middle of Racecourse Flat to re-establish a salt marsh community could be considered a offset as it restores previously destroyed habitat.

The habitat created by allowing extensive tidal inundation of the East Marsh Lagoon and Racecourse Flats would be quite different to the habitat lost to the proposed development and there is no evidence that it would be used by the waders currently using the area of the proposed development. Therefore it can not be considered an offset for habitat lost to the proposed development and is quite likely to cause considerable damage to the existing habitat on Racecourse Flat which already contains three confirmed and possibly an additional threatened species.

Another consequence of the proposed offset would be erosion of the existing sandflats at the southern end of the bay and thereby loss of wader habitat in this area. East Marsh lagoon is currently connected to Ralphs Bay by a single small pipe. The Walker Corporation proposal would replace this with multiple large culverts. This would result in a huge increase in the tidal flow into East Marsh Lagoon during the flood tide. This water would then drain out across the existing sandflats on the ebb tide. The greatly increased flow of water across the existing sandflats would erode and extend the existing channel beside Dorans Road. This would destroy existing wader habitat in the area and the eroded material would end up in the proposed navigation channel thereby increasing the frequency of maintenance dredging. This issue has not appear to have been addressed in the DIIS.

In summary there is no evidence that the proposed offset would create habitat that would replace the habitat destroyed by the proposed development, it is more likely that the proposed offset would destroy existing valuable habitats on Racecourse Flats and the southern end of the Lauderdale sandflats.

### *High tide roost and translocated oyster and mussel bed*

The only other proposed direct offset to the removal of approximately 85 ha of wader habitat is to translocate a small “mussel and oyster” bed to the southern part of the sandflats, and to create an artificial roosting habitat, also in the southern part of the sandflat. It should be noted that both these offsets would be created in existing wader foraging habitat. Replacing foraging habitat with roosting habitat can not be considered an offset and may actually be detrimental to wader populations in the area. Local wader experts have advised me that there is no evidence that oysters are used as a food resource by pied oystercatchers in Tasmania and mussels are only a minor food source. Even if the oyster and mussel bed is a food resource for waders, there is undoubtedly a reason that the mussel and oyster bed identified by Walker Corporation’s consultant occurs where it does and no evidence to suggest it would survive either the translocation process or in the different environment in the southern portion of the sandflats. One could ask the question, if the southern portion of sandflats was suitable habitat for mussel and oyster beds, why don’t they occur there?

The proposed high tide roost would be created in existing foraging habitat and would further reduce the amount of foraging habitat on the sand flats. At the same time the proposed increased flooding of East Marsh Lagoon and Racecourse Flats would remove one of the existing high tide roosting areas used by

Pied Oystercatchers (the bare sides of East Marsh Lagoon). An offset strategy that creates one habitat element (roosting site) by destroying another habitat element (foraging habitat) cannot be considered an "offset".

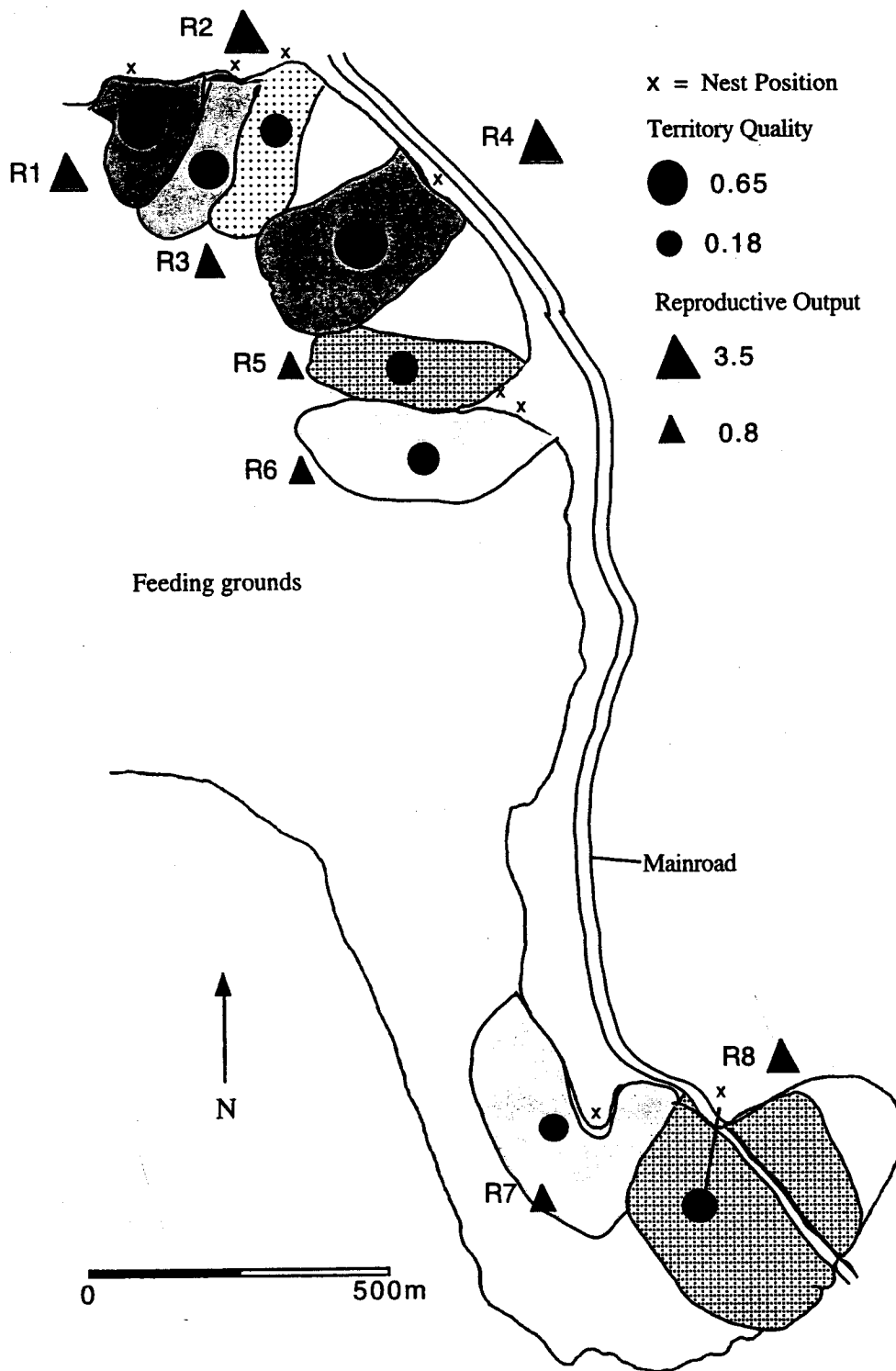
It should also be noted that all the proposed offsets, if considered advantageous, are relatively cheap and could easily be undertaken without the involvement of Walker Corporation. The other problem with the proposed offsets is that they would be created shortly before, or at the same time as the habitat loss they are supposed to offset occurs. Therefore there would be no opportunity to check their effectiveness before irreversible damage occurs to existing habitat.

*Critical habitat for Pied Oystercatchers*

The critical habitat for Pied Oystercatchers is not so much general foraging habitat or high tide roosting areas but quality breeding habitat. The area of sandflats that would be removed by the proposed canal estate is in a much higher energy wave environment than the proposed offset and there is already research that shows it is the favoured breeding area for the Pied Oystercatchers in the area. See attached figure from Trinder D. M. (1998) *A comparison of the territory quality and parental quality in relation to the breeding success of the Australian pied oystercatcher, Haematopus longirostris*. BSc Honours thesis, University of Tasmania). This figure shows that the territories of 6 out of the 8 breeding pairs of Pied Oystercatchers on the Lauderdale sandflats at the time of the study were in the area that would be destroyed by the proposed canal estate and that the breeding habitats that would be destroyed were of higher quality than the two at the southern end of the sand flats.

The claim that most of the existing wader habitat will be lost due to sea level rise is misleading. The sediments making up the sandflats are moved around by wave and current action as evidenced by the megaripples that can be seen on the northern section of the sandflats. As the surface sediments are of Holocene origin it means they were transported to their current location as sea level rose after the last glacial period. There is no reason to assume they would not be built up further by rising sea levels thus maintaining wader habitat.

# Attachments



**Map 2.1** Map of Ralphs Bay showing position, boundaries, Reproductive Output (RO) and Territory Quality (TQI) of territories.