Submission No 448

INQUIRY INTO IMPACT OF THE WESTERN HARBOUR TUNNEL AND BEACHES LINK

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Submission to the NSW Upper House Inquiry into the impact of the Western Harbour Tunnel and Beaches Link

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Urgent actions required by NSW EPA

1 Focus of this submission

This submission is prepared based on my experience gained over some 30 years as a consultant and as a site auditor in relation to assessment and management of contaminated land, including sediments, and in providing advice to State and Federal Government bodies and large corporations on preparation of requests for tenders to contractors, evaluation of tenders and auditing and supervision of environmental investigation programs and remediation of contaminated land, including sediments.

The principal focus of this submission relates to the failure of TfNSW to document of measures to be implemented to minimise dispersion of contaminated and uncontaminated sediments and dissolved contaminants into the waters of Lower Sydney Harbour during dredging within the alignment of the Immersed Tube Tunnel (ITT), which forms part of the Western Harbour Tunnel (WHT) project, which has been deemed State Significant Infrastructure.

The ITT is proposed to extend beneath Lower Sydney Harbour between Yurulbin Point, Birchgrove, and to the disused Coal Loader at Waverton, a distance of approximately 750 metres.

The ITT is proposed to be joined to on-shore tunnels bored through sandstone bedrock.

The principal concerns of this submission arise from the lack of reliable information provided in the Environmental Impact Statement (EIS), in the subsequent Submissions Report and in the weak submission to the EIS made by the EPA relating to:

- dredging of contaminated and uncontaminated sediments along the alignment of the ITT, and the large volume of contaminated and uncontaminated sediments dispersed into the waters of Lower Sydney Harbour during dredging;

- the lack of reliable estimates of the aerial and depth extents of contaminated sediments and their volumes, which may give rise to over- dredging, both laterally and at depth. This deficiency gives rise to unnecessary volumes of sediment being dredged as contaminated and subsequently being treated and disposed to landfill. Each of these factors has a high probability of contributing to cost and time overruns;

- the lack of regulatory requirements by NSW Environment Protection Authority (EPA), in particular to the EPA's weak submission to the EIS relating to dispersion of contaminated and uncontaminated sediments during dredging along the alignment of the ITT, which was stated in the EIS to require the removal of nearly 1 million cubic metres of contaminated and uncontaminated sediments; and

- disturbance of sediments by transit of vessels over shallow waters in construction support sites at Snails Bay, Berrys Bay and White Bay and construction of coffer dams at Yurulbin Point and the Waverton Coal Loader.

Another principal concern results from the EPA not requiring the adoption of strong regulatory requirements for protection of waters of Lower Sydney Harbour, according to Water Quality Objectives (WQOs[1]) endorsed by the EPA, which address the following:

- "…adopting and meeting WQOs that have been adopted by the EPA to apply to the waters of Lower Sydney Harbour in respect of requirements for:
    - maintaining or improving the ecological condition aquatic ecosystems
    - secondary contact in waters used for recreational purposes, applying to wading and boating
    - visual amenity, clarity and colour
    - concentrations of toxic substances (contaminants)
    - protection of aquatic foods that will be cooked".

The absence of strong regulatory requirements gives rise to the high probability of cost and time overruns due to factors that have not been assessed in the EIS and the subsequent Submissions Report and which cannot be included in requests for tenders provided to prospective contractors.

Section 12 of this submission calls for the EPA to urgently provide their requirements for protection of the marine ecosystem and the health of recreational users of waters impacted by the ITT component of the WHT project.

In preparing this summary I have consulted with members of the Birchgrove, Balmain and Berrys Bay (Waverton) communities to learn of their concerns and have met with officers of Transport for NSW (TfNSW) and their relevant consultant in relation to dredging of sediments and the impacts to the marine ecosystem and the health of people using waters of the Lower Sydney Harbour for recreational purposes.

Dredging of a very large volume of contaminated and uncontaminated sediments to allow installation of the ITT is acknowledged in the EIS to give rise to a large volume of sediment being dispersed into the waters of Lower Sydney Harbour. The dispersed sediments pose a significant risk to the marine ecosystem and the safe use of the waters for passive recreational purposes.

Installation of the ITT and ancillary works in construction support sites represent the highest risk to the environment in the WHT project. In this respect, documentation assessing the risks and providing rigorous measures to protect the environment is required to be comprehensive, to actually assess the risks posed and to meet requirements of regulators. Unfortunately, these requirements were not realised by documents prepared for TfNSW referred to in this submission.

It is a matter of disappointment to me that the poor quality of the EIS and the Submissions Report allowed the Department of Planning to approve the WHT project. Reasons for my opinion are addressed in this submission.

To enable the ITT and the on-shore components of the WHT project to proceed efficiently with due protection of human health and the environment, there is a requirement for urgent actions to be taken by the EPA. Actions directly applicable to the ITT are addressed in this submission.

[1] Documents pub shed by the EPA drf ne "A water qua ty object ve s a numer ca concentrat on m t or descr pt ve statement to be measured and reported back on. It s based on sc ent f c water qua ty cr ter a or water qua ty gu de nes but may be mod f ed by other nputs such as soc a , cu tura , econom c or po t ca constra nts."

2 Terms of reference of the Inquiry addressed in this summary

Term of reference 10 (j): the impact on the environment, including marine ecosystems

Marine environment

The primary object of this submission is to require the EPA to set parameters to ensure environmental protection measures, monitoring and reporting are carried out in a manner that ensures the protection of human health and the environment during dredging of both contaminated and uncontaminated sediments and in which communities of Birchgrove, Rozelle and Berrys Bay can have confidence in.

The submission addresses measures that require implementation urgently by the EPA to allow timely commencement and completion of the ITT in a program that minimises risk to the marine environment of parts of Sydney Harbour and to recreational users of the waters of Lower Sydney Harbour and to the health of recreational users of the waters of Lower Sydney Harbour.

On-shore environment

Impacts arising from 18 on-shore sites identified in the EIS as potentially contaminated remain unable to be assessed because no environmental investigations were carried out in compliance with guidelines made by the EPA. Consequently, no assessment of risk posed by these sites could be made. The absence of assessment of risks posed by these sites is a failure of the EIS and results in relevant SEARS for the project being unaddressed.

Given that on-shore tunnelling is reported to have commenced from the Rozelle Interchange as part of enabling works of the WestConnex project and presumably will proceed to Yurulbin Point and from Waverton to Cammeray, results of environmental investigations of potentially contaminated sites referred to in the EIS are required to be completed before the ITT component of the WHT project commences.

Term of reference 3 (c): the cost of the project and, including the reasons for overruns

TfNSW has not made public their cost estimates for construction of the ITT and ancillary works.

Contractors bidding for dredging, treatment and transport of contaminated sediments and other works associated with installation of the ITT will be in a position to make adequate provisions for proper measures to protect the marine environment and to monitor, implement corrective measures and reporting only if the EPA provides its requirements for environmental compliance.

If the EPA's requirements for installation of protective barriers around dredging areas, monitoring of their effectiveness, corrective actions in the event of a malfunction and reporting results of the monitoring program are made available urgently and to be included in the tender process, contractors will be able to allow realistic costs for each of these measures in their tenders. This process will minimise the number of cost variations that will inevitably arise if the EPA's environmental and human health protection measures have not been stated prior to issue of requests for tender and in following tender documents.

3 Documents prepared for TfNSW referred to in this submission

The following documents prepared for TfNSW are referred to in this summary:

- **WHT EIS** prepared by TfNSW (January 2020) that, for the purpose of this summary, should have identified and assessed risks posed to human health and to the environment by construction of the WHT, involving the requirement to dredge large volumes of

contaminated and uncontaminated sediments, and the measures proposed to reduce risks to levels protective of human health and the marine ecosystem.

- **Submissions to the EIS** prepared by regulatory authorities and the public setting out issues with the EIS that are required to be addressed by TfNSW. The closing date for submissions was 30 March 2020.

- **Submissions Report** prepared by TfNSW (September 2020), that should have:

  In relation to SSI projects, DPIE's website states "…the purpose of the Submissions Report is to:
  - give the proponent an opportunity to respond to the issues raised in submissions and to describe what action has been taken to address these issues since public exhibition of the EIS
  - help the community and government agencies understand how the issues raised have been addressed
  - assist the approval authority to assess the merits of the project."

  The Submissions Report is the final document considered by DPIE in assessing merits of the project and no opportunity is available to provide comments on the Submissions Report and to be considered by DPIE.

In my opinion, neither the EIS nor the Submissions Report met the requirements of SEARS made by DPIE.

4 EPA's submission to the EIS relating to dredging of sediments: final day, brief, weak

The submission by the EPA responding to the dredging of sediments documented in the EIS failed to address concerns of the community and was submitted on the final day for lodging of submissions (30 March 2020).

The EPA's submission was extremely brief, being of approximately one and one-half pages in length comprising only three technical "requests" – not one requirement! The brevity and the timing of the EPA's requests led the community to conclude the EPA did not adequately address the methods proposed in the EIS for dredging, transport and disposal of contaminated sediment and for monitoring environmental compliance.

The brevity of the EPA's submission to the EIS, its lack of detailed requirements and the unfortunate fact that the submission was dated the last day allowed for submissions led the community having no confidence in the EPA's role in ensuring protection of the waters of Lower Sydney Harbour during dredging of sediments for the ITT, for transport and treatment of contaminated sediments and for dispersion of sediments into waters of Lower Sydney Harbour caused and ancillary works in construction support sites, particularly transit of support vessels over shallow contaminated sediments.

The EPA's submission did not require compliance with:

- rigorous environmental protection measures to be implemented, monitored and reported, as would be expected for dredging and other operations being conducted in sensitive waters of Lower Sydney Harbour;

- the EPA was expected to provide WQOs that would ensure minimising dispersion of suspended sediments into the waters of Lower Sydney Harbour in compliance with WQOs they have endorsed;

- rigorous environmental protection measures to be implemented to minimise loss of large volumes of contaminated and uncontaminated sediments from the bed of Lower Sydney Harbour during dredging for placement of ITT; and

- one or more environmental protection licences (EPLs), issued under the Protection of the POEO Act), would be required to be implemented by contractors for various operations within the alignment of the ITT and within construction support sites where sediments, both contaminated or uncontaminated, were likely to be disturbed and at White Bay where contaminated sediments were proposed to be treated prior to their disposal to landfill.

The EPA's submission to the EIS did not require, but should have, required detailed assessment of the environmental impacts expected to be experienced form contamination that had been investigated in compliance with guidelines made by and endorsed by the EPA. The EIS did not contain sufficient detail to allow assessment of the risk posed by any of the contaminated ad potentially contaminated sites.

In my opinion, given the failure of the EIS to adequately address critical environmental issues, the EPA should have required the EIS to be revised and resubmitted for their review.

Requirement for a site auditor

The concluding paragraph of the EPA's submission stated, "The sediment contamination assessment and mitigation measures proposed should be reviewed and approved as part of the site audit being undertaken by the EPA-accredited site auditor for the infrastructure project".

Firstly, the EIS did not contain detailed procedures to asses contamination measures or environmental mitigation measures.

Secondly, it is not the role of the site auditor, nor is the site auditor permitted by guidelines made by the EPA under the CLM Act, to set performance criteria for sediments (or for any other environmental medium).

Reports prepared by an independent consultant for review by the site auditor are required to meet requirements of the EPA made under the CLM Act and the POEO Act. Consequently, the site auditor, during the course of the sediment dredging works, can ensure by review of consultants' reports that parameters set by the EPA have been complied with.

The EPA's submission to the EIS failed to require rigorous environmental protection measures be implemented to prevent "loss" (i.e. dispersion) of contaminated and uncontaminated sediments and dissolved contaminants released from the bed of Lower Sydney Harbour during dredging.

In addition, as stated in the paragraph above, the EPA is the regulator charged with protection of the environment, and not the site auditor, who must be the body to set compliance requirements to ensure protection of human health and the environment during dredging works and operation of construction sites. The site auditor can, during works, ensure the parameters set by the EPA are complied with by review of reports provided by an independent environmental consultant who is certified by an EPA-recognised body.

5 EPA's responsibility to require protection of Lower Sydney Harbour

The EPA's website states "The NSW Environment Protection Authority (EPA) is the state's primary environmental regulator and focuses on regulating water pollution from activities included in Schedule 1 of the Protection of the Environment Operations Act (POEO Act)…". This act requires environmental compliance measures to be implemented in compliance with the terms of one or more EPLs.

Although the EPA's submission to the EIS contained a few, minor and generic requirements for environmental protection measures during dredging, transport and treatment of contaminated and uncontaminated sediments, the EPA did not reliably document their requirements to ensure unacceptable quantities of sediment and dissolved contaminants do not migrate from the dredging areas and from construction support sites.

With respect to contaminated sediments, the EPA's submission to the EIS stated "…assessment of contaminated sediments and mitigation measures proposed should be reviewed and approved as part of the site auditor by the NSW EPA-accredited site auditor …"

Approval by the site auditor of assessment of sediment contamination under the CLM Act of report/s characterising the environmental condition of the sediments, and as they are known to be contaminated by a Remediation Action Plan (RAP) that sets out the nature and extent of the contamination and the method/s proposed to be employed to remediate the site so that it can be made suitable for the proposed use.

No RAP was referred to in either the EIS or in the Submissions Report and this omission is in conflict with the EPA's requirement in its submission to the EIS.

The EIS documented contaminated sediments would be dredged for over an area exceeding 10 hectares, which greatly exceeds the 3 hectares triggering the requirement of Schedule 1 of the POEO Act, to be regulated by the EPA under the provisions of an EPL.

The EPA's request that the site auditor approve contaminated sediment mitigation measures is inappropriate as noted above, the site auditor is accredited under the CLM Act, whereas pollution of waters is the responsibility of the EPA under the POEO Act. Clearly, it is the EPA's responsibility to administer its requirements under the both the CLM Act and the POEO Act.

Specifically, neither the EIS nor the Submissions Report documented the EPA's consideration of or approval and environmental protection measures required to be implemented:

- within the alignment of the ITT:
    - for the use of shallow silt curtains of 2 to 3 metres depth around areas where 142,000 cubic metres of contaminated sediments were proposed to be excavated using a clamshell bucket in waters ranging in depth from 11 to 15 metres during which approximately 2100 cubic metres of contaminated fine-grained sediments would be "lost" during excavation of contaminated sediments within shallow silt curtains;

    - around areas where the EIS estimated approximately 813,000 cubic metres of uncontaminated sediments and sandstone bedrock were proposed to be excavated using a suction cutter dredge during which approximately 15,000 cubic metres of uncontaminated fine-grained sediments would be "lost" to the waters of Lower Sydney Harbour during excavation of approximately; and

- within Snails Bay and Berrys Bay:

    - for disturbance of an unquantified volume of highly contaminated fine-grained sediments into the waters of western Berrys Bay by transit of vessels, including stabling of ocean-going barges; and

    - for disturbance of an unquantified volume of sediments, the contamination of which has not been investigated.

Given the large volume of sediments that were stated in the EIS to be "lost" to the waters of Lower Sydney Harbour, the sensitivity of these waters and in consideration of the improvement in

water quality within Lower Sydney Harbour over the past decade or so, it is essential that the EPA regulates under the POEO Act pollution of waters of Lower Sydney Harbour by both contaminated and uncontaminated sediments and imposes strict monitoring requirements during dredging and corrective measures in the event of loss of excessive volumes of fine-grained contaminated sediments to the waters of Lower Sydney Harbour.

The failure of the EIS, the EPA's submission to the EIS and the Submissions Report to properly address the requirement for stringent environmental protection measures and their monitoring should not be taken as indicating the EPA would approve the loss of large volumes of contaminated and uncontaminated sediments to the waters of Lower Sydney Harbour given their negative impact to the health of fish, crustaceans and molluscs and to smothering of kelp and sea grass.

It is also a failure of the EPA's submission to the EIS to not address their requirement for an EPL for dredging works and operations of the contaminated sediment treatment works at White Bay.

The requirement for compliance with the terms of an EPL may give rise to significant costs to the contractor that need to be addressed in request for tender documents to minimise the number of variations claimed by the contractor to address issues unidentified in requests for tender and in contract documents. Variations of this type are recognised to commonly result is significant cost overruns.

6 Secretary's Environmental Assessment Requirements not complied with by the EIS

Noncompliance with DPIE's requirements for an EIS

Guidelines published by DPIE require an EIS to contain an assessment of key issues, as follows:

"1. The level of assessment of likely impacts must be proportionate to the significance of, or degree of impact on, the issue, within the context of the proposal location and the surrounding environment. The level of assessment must be commensurate to the degree of impact and sufficient to ensure that the Department and other government agencies are able to understand and assess impacts."

2. For each key issue the Proponent must:

- describe the legislative and policy context, as far as it is relevant to the issue;
- identify, describe and quantify (if possible) the impacts associated with the issue, including the likelihood and consequence (including worst case scenario) of the impact (comprehensive risk assessment), and the cumulative impacts;
- demonstrate how potential impacts have been avoided (through design, or construction or operation methodologies);
- detail how likely impacts that have not been avoided through design will be minimised, and the predicted effectiveness of these measures (against performance criteria where relevant); and
- detail how any residual impacts will be managed or offset, and the approach and effectiveness of these measures."

3. Where multiple reasonable and feasible options to avoid or minimise impacts are available, they must be identified and considered and the proposed measure justified taking into account the public interest."

The EIS did not provide adequate documentation to comply with DPIE's requirements for any of the key issues required by DPIE.

Noncompliance with SEARS requiring remediation of contaminated sediments

The following the SEARS were most relevant to the dredging of contaminated and uncontaminated sediments from the alignment of the ITT:

- "…details of contamination characteristics and measures to manage this spoil to avoid adverse impacts to land and water quality"
- "…whether the harbour sediment is likely to be contaminated and identify if remediation is required"
- "… that remediation would be undertaken in accordance with current guidelines"
- to manage this spoil to avoid adverse impacts to land and water quality."
- "Where contaminated spoil and/or sediments are to be handled at Glebe Island and/or White Bay, the Proponent must provide details of contamination characteristics and measures."

In relation to contaminated sediments, relevant SEARS set out in the EIS required that if the sediments were identified to be contaminated that remediation would be undertaken in accordance with current guidelines. The remediation guidelines referred to by the SEARS were not specified, but relevant guidelines are those made by the EPA under the Contaminated Land Management Act (CLM Act) relating to the assessment and remediation of contaminated sediments and the comprehensive guidelines relating to assessment of contaminated land made by the National Environment Protection Council, which have been endorsed by the EPA.

The CLM Act states "…land includes water on or below the surface of land and the bed of such water", so that the provisions of the CLM Act apply to the assessment and remediation, i.e. dredging of contaminated sediments within the alignment of the ITT and to highly contaminated sediments within the Berrys Bay construction support site that would be dispersed by transit of vessels over water less that 5 to10 metres deep, which was stated in the EIS was likely to result in dispersion of sediments. It is apparent that operation of vessels in parts of Berrys Bay would encounter waters less than 1 metre deep, beneath which very high concentrations of tributyltin (highly toxic to the marine environment), heavy metals and other contaminants have been reported present in sediments.

Because a significant volume of the sediments proposed to be dredged for installation of the ITT are contaminated, the EPA sated in their submission to the EIS that removal of these sediments is required to be undertaken as a remediation project. The EIS did not refer to remediation of the sediments and evidently proposed removal of the sediments would be a conventional engineering project.

With respect to remediation projects, the relevant guidelines referred to by the EPA require a comprehensive investigation to characterise contaminated sediments in accordance with at least the following guidelines made or endorsed by the EPA:

- "Sampling Design Guidelines", which document requirements for sampling contaminated land.
- "Guidelines for Consultants Reporting Contaminated Land: Contaminated land guidelines", which document requirements for a Remediation Action Plan to document the remediation works required to make the site suitable for the proposed purpose and a validation plan to demonstrate that, at the conclusion of the remediation works, the site is suitable for the proposed use.
- "National Environment Protection (Assessment of Site Contamination) Measure, which documents comprehensive requirements for assessing contaminated land (ASC NEPM).

Although the ASC NEPM was referenced in the "Contamination Factual Report - Marine Investigations" by Douglas Partners and Golder Associates dated December 2017, these stringent guidelines were not addressed in respect of contamination of waters by suspended sediments and by dissolved contaminants.

The Submissions Report, in respect to the assessment and remediation of the contaminated sediments. Rather, section A1.3 of Appendix A of the Submissions Report referred only to the requirements of guidelines designed specifically for assessment of sediment quality for ocean disposal of uncontaminated sediments.

The criteria referred to in the Submissions Report for ocean disposal of sediments are far less rigorous than required by guidelines made by or endorsed by the EPA for addressing contaminated sediments and waters impacted by contaminated sediments.

In respect to the dredging of sediments, and the requirement to minimise dispersion of fine-grained contaminated and uncontaminated sediments caused by dredging and by transit of vessels in shallow waters of construction support sites at Snails Bay (Birchgrove), Waverton Coal Loader, Berrys Bay and White Bay, the SEARS for the EIS were not complied with in the EIS and were not addressed in the subsequent Submissions Report.

With respect to the ITT the EIS should have been rejected by:

- the Department of Planning, Industry and Environment (DPIE) because it did not meet the requirements of the Secretary's Environmental Assessment Requirements (SEARS);

- the EPA because the impacts to the health of users of Iron Cove, Yurulbin Point, Snails Bay, Berrys Bay and White Bay and impacts to the marine environment arising from sediments "lost" into the waters of Sydney Harbour during dredging was not assessed in the EIS and was only fleetingly addressed in the subsequent Submissions Report.

The environmental sensitivity of installation of the ITT was identified in the Appendix M of the EIS as follows:

- "Contaminated sediments are likely to be disturbed during dredging activities required for the installation of the immersed tube tunnel and piling work to establish wharf structures at the following construction support sites: White Bay (WHT3), Yurulbin Point (WHT4) and Berrys Bay (WHT7) and the immersion pontoon at Snails Bay. Potential impacts as a result of disturbance of contaminated sediment without appropriate remediation and/or management may include:

    - Contaminant exposure risk to project personnel
    - Contaminant exposure risk to and sedimentation to marine receivers
    - Cross contamination associated with the incorrect handling or disposal of spoil/unexpected finds
    - Accidental spills during the transportation of spoil or disposal of spoil across Sydney Harbour."

However, the risks to human health and to the marine ecosystem of Lower Sydney Harbour and the measures required to minimise the risks were not detailed in the EIS and Submissions Report and thereby did were not in compliance with guidelines made by the EPA and as required by the SEARS.

In my opinion, given the failure of the EIS to adequately critical issues required by the SEARS, DPIE should have required the EIS to be revised and resubmitted for their review.

7 Summary of concerns with the EIS and Submissions Report

Community concerns

The communities of Birchgrove, Waverton and Rozelle were concerned by the EIS failing to provide documentation of measures to protect the marine ecosystem of Lower Sydney Harbour during dredging of nearly 1 million cubic metres of contaminated and uncontaminated sediments within the alignment of the ITT and the health of recreational users of the waters of Snails Bay, Berrys Bay, the Dawn Fraser swimming pool in Balmain and the Balmain and Greenwich Sailing Clubs.

Overall, the communities were concerned of the effectiveness of shallow silt curtains to contain contaminated and uncontaminated sediments dispersed by dredging of sediments in deep, fast flowing water known to be present between Yurulbin Point, Birchgrove, and the coal loader at Waverton.

Some further details of the communities' concerns are provided in following sections of this submission and additional details are provided in my submission to the EIS, "Submission to the Western Harbour Tunnel Environmental Impact Statement", dated 17 March 2020, which is available on the DPIE's Major Projects website.

The communities were concerned that the EIS documented a cocktail of highly toxic contaminants (including dioxins, tributyltin, pesticides and heavy metals, including arsenic, mercury, lead) in sediments that were proposed to be dredged and the consequent dispersion of fine-grained contaminated sediments into the waters of parts of Lower Sydney Harbour.

The communities lost confidence in the EIS when TfNSW would not provide access to the report referred to in the EIS that documented the concentrations of the chemicals of potential concern was denied as TfNSW considered the report was "commercial-in-confidence".

Following TfNSW's denial of my request to provide the report containing concentrations of the chemicals of potential concern, community concerns increased and subsequent media attention resulted in the report containing concentrations of chemicals of potential concern being provided by TfNSW.

After release of the above report, the communities remained concerned that environmental protection measures were not documented adequately in the EIS or in the subsequent Submissions Report to protect the marine ecosystem or the health of recreational users of waters of Snails Bay and Berrys Bay. Concerns were also expressed relating to the safety of use of the Dawn Fraser swimming pool located in Balmain and of the waters of Lower Sydney Harbour used by the Balmain Sailing Club.

Incorrect volume estimate of contaminated sediments

The EIS stated that 142,500 cubic metres of contaminated sediments and 823,000 cubic metres of uncontaminated sediments would be excavated, resulting in dispersed into the waters of Lower Sydney Harbour of approximately 2140 cubic metres of contaminated sediments and approximately 15,000 cubic metres of uncontaminated sediments.

In addition, the Submissions Report documented that the alignment of the ITT had been changed, but inadequate documentation was provided in the Submissions Report to allow reliable estimates of depths, aerial extent and volume of contaminated sediments to be made in view of the changed alignment.

Although having undertaken supplementary investigations after the date of the EIS and before the Submissions Report was released, TfNSW did not document the correct volume of contaminated sediments in the subsequent Submissions Report, nor did it address increased/decreased

dispersion of contaminated and uncontaminated sediments into the waters of Lower Sydney Harbour.

The volume of contaminated sediments documented in the EIS and perpetuated in the Submissions Report is clearly incorrect. For example, my review of the data presented in the "Western Harbour Tunnel Contamination Factual Report - Marine Investigation" by Douglas Partners & Golder Associates (December 2017) clearly identified contaminated sediments were not uniformly present over a depth of 1.5 metres along the entire alignment of the ITT, in contrast to the distribution of these sediments adopted in the EIS, and no contaminated sediments were present over a significant distance near the centre of the proposed ITT due to fine-grained sediments having been washed away by strong currents.

Despite my attempts to have TfNSW document the correct volume estimate of contaminated sediments they have not done so. At a meeting with TfNSW officers, their consultant agreed with me that the volume of documented in the EIS was incorrect.

A reliable estimate of the volume of contaminated sediments provides a vital input to documents provided to contractors to allow them to scope and price the ITT dredging works, transport to treatment of contaminated sediments at the White Bay contaminated sediment treatment works and subsequent transport of treated sediments to landfill.

The consequence failure of the EIS and the Submissions Report to reliably identify the depth and aerial extents of contaminated sediments has not been provided by TfNSW. This omission has not met a critical requirement if the SEARS and does not provide suitable contractors with reliable data relating to the distribution, vertically and laterally, on which to respond to a request for tender. Inevitably, this situation gives rise to inflated/incorrect pricing from contractors and to incorrect work schedules and, potentially, also to inappropriate environmental protection measure being installed and inappropriate equipment being used.

Employment of shallow silt screens

The EIS acknowledged find-grained contaminated and uncontaminated sediments would be "lost" (more correctly dispersed) into the waters of Lower Sydney Harbour during dredging and by transit of vessels within construction support sites in Snails Bay and Berrys Bay.

The EIS did not provide details of measures proposed to prevent dispersion of the sediments, other than deployment of silt screens that would extend 2 to 3 metres from the water surface.

However, as dredging was to take place in waters ranging from 11 to 15 metres deep, concern was expressed that as disturbance of sediments occurred by operation of dredges at the seafloor and strong currents known between Yurulbin Point and the Waverton Coal Loader the shallow silt curtains would be unable to contain the dispersed sediments.

Dispersion of sediments in construction support sites

In addition to disturbance of sediments within the alignment of the ITT, the community was concerned that the EIS did not address disturbance of sediments in shallow waters of Snails Bay (Birchgrove) and Berrys Bay (Waverton) that were proposed to be used as construction support sites to serve dredging and installation of the ITT. Both these locations contain water less than 5 to 10 metres deep stated disturbance of sediments on the seafloor could be expected (Section 4.1 of Appendix Q "Technical Working Paper: Marine Water Quality").

Water less than 10 metres deep is present in Snails Bay and less than 5 metres in Berrys Bay, but the disturbance of sediments in these areas, the impact to users of these waters and to the environment were not addressed in the EIS or the Submissions Report.

Sediments in shallow waters of Berrys Bay, particularly in the western part of the bay, are known to be contaminated by a cocktail of contaminants that are highly toxic to the marine ecosystem,

including extreme concentrations pf tributyl tin (an anti-foulant used in hulls of vessels), polynuclear aromatic hydrocarbons and heavy metals. The EIS did not address this issue.

No data are available relating to contaminants in sediments in Snails Bay. However, industrial uses of land adjoining the bay and the stabling of vessels at dolphins in the bay over many decades indicate that contaminants are likely to be present in sediments. The EIS did not address this issue.

Lack of performance criteria for protection of human health and of the marine ecosystem

Installation of the ITT is the most environmentally sensitive aspect of the WHT project and for which significant time and cost overruns may ensue relating to:

- the EIS and subsequent Submissions Report lacking important details for contractors to provide for protection of the marine ecosystem and human health during dredging of contaminated and uncontaminated sediments to allow installation of the ITT and during transit of vessels within shallow waters of construction support sites; and

- the EPA making a weak submission to the EIS and failing to provide their requirements for performance criteria relating to protection of the waters of Lower Sydney Harbour in accordance with the WQOs endorsed by the EPA.

There is an urgent requirement for the EPA to make available its requirements for water quality performance criteria for contaminated, uncontaminated sediment and dissolved contaminants dispersed into the waters of Lower Sydney Harbour during dredging and during operation of construction support sites.

Impacts to requests for tender and for contracts of works

With respect to installation of the ITT, contractors tendering for works require performance criteria they are required to comply with during their works to be clearly stated.

To inform requests for tenders and subsequent works contracts, the EPA is required as a matter of urgency to document rigorous environment and human health protection measures that are required to be implemented, monitored and reported during dredging along the alignment of the ITT and during operation of construction support areas, particularly relating to transit of vessels across shallow waters of construction support sites where sediments, some highly contaminated, are likely to be dispersed to parts of Lower Sydney Harbour.

It is stressed the EPA's requirements for minimising risks to human health and to the environment in operations where sediments are disturbed are of critical importance to contractors preparing their tender documents for dredging and construction of the ITT. Situations where the requirements for human health and environmental protection measures have not been documented at an early stage of project definition have commonly led to significant cost and time overruns.

On-shore contaminated sites – no environmental investigation - no assessment of risk

The EIS documented 18 potentially contaminated sites to be located in on-shore parts of the WHT project but for which no investigations were documented of contamination in accordance with guidelines made by the EPA.

In respect to the on-shore sites, the impacts posed by any contamination arising from contaminated sites identified in the EIS cannot be assessed. Consequently, the requirements of the SEARS in this respect were not complied with in the EIS.

With respect to potential contamination in onshore locations, the EIS was published prematurely, before appropriate investigations and environmental protection measures had been documented so that the impacts to human health and the environment by excavation, transport and treatment of contaminated sediments and by excavation of large volume of uncontaminated sediment could be assessed and control measures documented.

8 Inadequate environmental protection measures documented in the EIS and Submissions Report

The EIS stated dredging within the ITT alignment would result in “loss” of excavated sediments into the waters of Lower Sydney Harbour but the “loss” would be contained within floating silt curtains that would extend to depths of only 2 to 3 metres below the water surface.

The term “lost” used in the EIS and Submissions Report to refer to sediment dispersed into the waters of Lower Sydney Harbour during dredging and construction operations should not be employed because the sediment are not “lost” and will be transported by currents, dispersed and suspended within the waters beyond the dredging works areas where it will subsequently “found” to be ingested by marine life and/or deposited on adjacent to the seafloor where it will be ingested by crustaceans and will smother sea grass and kelp.

The ability of the shallow silt curtains, extending from the surface to depths of 2 to 3 metres from the water surface, to minimise dispersion of sediments mobilised during dredging is not credible as the depth of water along the alignment of the tunnel ranges from 10 to 15 metres and significant tidal and wave currents are known in the alignment of the WHT. Dislodgement of sediments by dredging obviously takes place at the seafloor.

Dispersion of sediments dislodged by dredging will inevitably be dispersed in the strong currents that characterise waters at Yurulbin Point, after all, the Aboriginal name Yurulbin means “swift running water”.

The presence of fast currents is also demonstrated by the lack of fine-grained sediments over parts of the alignment of the ITT. This issue, although obvious by inspection of the “Contamination Factual Report - Marine Investigations” report, that formed Appendix M of the EIS, was not addressed in the EIS nor the Submissions Report.

Neither the EIS nor the Submissions Report documented how shallow floating silt curtains could retain sediments that are released by dredging from the seafloor 7 to 12 metres below the depth extent of the silt curtains, particularly given strong currents within the corridor of the ITT.

The EIS did not address any mitigation measures to minimise loss of very highly contaminated sediments in shallow waters of the Snails Bay and Berrys Bay construction support sites that will be traversed by support vessels that likely will mobilise the dispersed sediments into the waters of Lower Sydney Harbour.

My submission to the EIS was critical of the environmental protection measures described in the EIS and called for more rigorous protection measures and monitoring of water quality to be implemented during dredging and support operations. This issue was not addressed in the subsequent Submissions Report.

9 Further issues relating to the dispersion of sediments during dredging

No justification of quantity of loss of sediments to waters of Lower Sydney Harbour

The EIS stated that during dredging 1.5 to 2.7 % of the excavated sediments would be “lost” to the waters of Lower Sydney Harbour.

Neither the EIS nor the Submissions Report documented how sediment would be dispersed into the waters of Lower Sydney Harbour and further dispersed by strong currents prevalent in the alignment of the ITT in the following situations:

- during operation of the backhoe dredge, proposed for excavation of contaminated sediments, silty clay and sandstone. However, it is clear that operation of the backhoe dredge would dislodge fine-grain components at the seafloor that would be dispersed into the water column and swept away under the shallow floating silt curtains.

- during operation of the trailing suction hopper dredge, proposed for excavation of a range of uncontaminated sediments and sandstone. However, it is clear that sediments adjacent to the dredge head would be dispersed as it is dragged through the sediment.

The EIS did not provide justification for adopting a “loss” of 1.5 to 2.7 % of the excavated sediments given that laboratory testing of sediment samples indicated that sediments to be excavated comprised an average of approximately 40 % silt or smaller-grained components so that it is feasible that greater than 1.5 to 2.7 % of the excavated sediments could be “lost” to the waters of Lower Sydney Harbour. This “loss” could be in excess of 30,000 cubic metres – equivalent to 12 Olympic-sized swimming pools of sediment.

The “loss” of a large volume of contaminated sediments to the waters of Lower Sydney Harbour is required to be minimised as the cocktail of toxic chemical compounds are hazardous to the marine environment and dispersion of contaminated and uncontaminated sediments will cause smothering of sea grass, kelp and crustaceans, such as oysters, which have been making a comeback as the quality of water in Lower Sydney Harbour has improved as many of the sources of contaminants have been remediated.

Requirements for environmental protection measures

The EPA, in their submission to the EIS, should have required detailed documentation of environmental protection measures required to be implemented to minimise dispersion of fine-grained sediments and dissolved contaminants to the waters of Lower Sydney Harbour.

Strong winds are commonly encountered in the Yurulbin Point area and records from Observatory Hill, Fort Denison and Sydney Airport within the years 2019-20 show winds exceeding 50 km/h on 50 % of days each month, with maximum gusts of 104 km/h.

Winds of the velocities noted in the above paragraph are known to give rise to white-capped waves and surface currents that would result in loss of suspended sediments across the floats of shallow silt curtains. This issue was addressed in neither the EPA’s submission to the EIS nor the Submissions Report.

Neither the EIS nor the Submissions Report documented measures to address contingencies, as required by the SEARS. In particular, the EIS and the Submissions Report should have documented measures to minimise loss of dispersed sediments from the dredging areas and measures to be employed if unacceptable quantities of sediment escaped from the shallow silt curtains or along the seafloor.

The use of full-depth silt curtains, anchored to the seafloor and installed so they are not oriented across tidal flows, have been employed successfully during dredging of contaminated and uncontaminated sediments in deep water subject to tidal and wind currents similar to observed at Yurulbin Point. The EIS and the Submissions Report should have addressed use of full-depth silt curtains, even though these curtains are more expensive and require more maintenance during their deployment.

At a meeting with TfNSW's officers, their consultant stated full-depth silt curtains could not be employed within the alignment of the ITT because currents cause them to flap, thus dispersing sediment into the water column.

Although I do not have expertise in design and implementation of silt curtains, the scientific and company literature indicates that it may be possible to install full-depth silt screens along the alignment of the ITT.

An example of specifications of successful employment of full-depth silt screens in a location in North America with similar sediment characteristics, water depth, wind and tidal conditions as can be expected along the ITT alignment is provided in Annexure A to this submission.

Minimising the dispersion of sediments, particularly contaminated sediments, into the waters of Lower Sydney Harbour is such a fundamental requirement of the WHT project, the EPA should have taken expert advice on the ability to deploy full-depth silt screens and documented their requirements in its submission to the EIS.

Given the inherent inability of shallow silt curtains to contain the dispersal of contaminated and uncontaminated sediments into the waters of Lower Sydney Harbour, the EPA must require TfNSW to urgently seek expert advice regarding the most effective measure/s to be implemented.

If the expert concludes that tidal and wind conditions within the alignment of the ITT are not able to be controlled so that unacceptable concentrations of suspended sediments are not permitted to contaminated the waters of Lower Sydney Harbour, it may be that the ITT project be redesigned or abandoned. The course of action required to be taken would, of course, be guided by performance parameters the EPA must provide in relation to acceptable concentrations of dispersed sediments and dissolved contaminants in the waters of Lower Sydney Harbour in proximity to dredging sites, coffer dams and construction support sites.

10 Requirement for reliable estimates of volumes of contaminated sediments

As noted above, the volume of contaminated sediments documented in the EIS and in the Submissions Report is incorrect.

The volume of contaminated sediments has not been reported following the change of alignment of the ITT set out in the Submissions Report.

Reliable estimates of the volumes of contaminated and uncontaminated sediments to be dredged and reliable estimates of the volumes of sediments that will be dispersed by dredging are essential so that reliable tender documents can be issued to prospective contractors who bid for the work.

The volume of contaminated sediments documented in the EIS and the Submissions Report has direct impact to the duration of dredging, type and specifications for environmental protection measures, loss or amenity to communities near work zones including requirement for noise and odour control measures, requirements for transport by barge to the White Bay contaminated sediment treatment works and operation of the treatment works, volume to be transported by road for disposal to landfill

Failure to provide in contract documents reliable estimates of the volume of contaminated sediments to be dredged, treated and disposed and the measures that must be implemented to minimise dispersion of dredged sediments are known to commonly result in very significant cost overruns in remediation works.

11 Inadequacies of the Submissions Report in relation to dredging of sediments

The Submissions Report documented a revised alignment for part of the ITT, but provided insufficient data relating to the extent of contaminated sediments within the revised alignment. Consequently, the revised volume of contaminated sediments was not provided in the Submissions Report, adding further unknowns to information required to be provided in requests for tender to be issued to contractors.

Although no further information other that documented in the EIS and Submissions Report, Part D of TfNSW's Submissions Report documented "Revised environmental management measures" listed a number of measures proposed to be implemented to reduce risks relating to "sensitive marine habitats".

Appendix A of Part D of TfNSW's Submissions Report provided an updated environmental risk analysis, which rated the "unmitigated risk" of dispersion of contaminated and uncontaminated sediments into Lower Sydney Harbour by dredging of both contaminated and uncontaminated sediments as "high".

Despite the high risk identified of dispersion of contaminated and uncontaminated sediments into Lower Sydney Harbour, the Submissions Report provided only vague responses that required unspecified actions to be implemented if dredging resulted in dispersed sediments exceeding unspecified acceptable levels, as yet unspecified by the EPA.

12 Summary of urgent actions required of EPA

Recent commencement of the on-shore tunnelling towards the WHT project

DPIE approved the WHT project in January 2021 as Sate Significant Infrastructure and stated "…construction is expected to start in the first quarter of 2021" (possibly delayed until 2022?) and it has been reported recently that on-shore tunnel construction has commenced from the Rozelle Interchange towards the ITT. These works are believed part of the WestConnex project.

Given that planning for the commencement of the ITT project is almost certainly proceeding, the EPA must act urgently to set out and publicly make available its performance criteria requirements to ensure minimal loss of sediments to Lower Sydney Harbour during dredging operations and transit of vessels within construction support sites.

The EPA must urgently provide its environmental and human health compliance requirements for the installation of the ITT, including ancillary works, as detailed below.

The communities of Birchgrove, Rozelle and Waverton are concerned that preliminary and dredging works for the ITT may be commenced prior to implementation of acceptable performance criteria being required by the EPA.

Water Quality Objectives

The EPA must urgently provide to TfNSW:

- its performance requirements to ensure unacceptable volumes of sediments are not dispersed to Lower Sydney Harbour during dredging for installation of the ITT and during operation of construction support sites in Snails Bay, White Bay and, especially, in Berrys Bay where sediments known to contain a cocktail of highly toxic contaminants are likely to be disturbed in shallow waters by transit of support vessels in the construction support site;

- its requirements for the disturbance of sediments and their migration from dredging within the ITT and for transit of vessels in construction support sites, namely:

    - adopting and meeting WQOs that have been adopted by the EPA to apply to the waters of Lower Sydney Harbour in respect of requirements for:

        - maintaining or improving the ecological condition aquatic ecosystems
        - secondary contact in waters used for recreational purposes, applying to wading and boating
        - visual amenity, clarity and colour
        - concentrations of toxic substances (contaminants)
        - protection of aquatic foods that will be cooked

WQOs applying to the ITT project are required to be defined by the EPA and provided to TfNSW for both suspended contaminated and uncontaminated sediments and for dissolved contaminants and to require:

- regular monitoring of water quality in proximity to the alignment of the ITT and within construction support sites and any other marine works in Snails Bay, Berrys Bay and White Bay and this information made publicly available on a daily basis; and

- corrective actions to be employed in the event of dispersion of contaminated or uncontaminated sediments into the waters of Lower Sydney Harbour that do not meet WQOs.

Advice re installation of reliable silt curtains

Given doubts arising from the high volumes of contaminated and uncontaminated sediments that are likely to be dispersed into the waters of Lower Sydney Harbour by strong currents below the depths of shallow silt curtains during dredging, the EPA must require TfNSW to urgently seek expert advice from a contractor who manufactures/installs silt curtains so that minimal dispersion of contaminated and uncontaminated sediments takes place into the waters of Lower Sydney Harbour during dredging along the alignment of the ITT and from operation of construction support sites.

Minimise dispersion of dispersed sediments

The EPA must urgently provide to TfNSW performance criteria required to be implemented to minimise the risks posed to the marine ecosystem and to human health by the dispersion of large quantities of contaminated and uncontaminated sediments to the waters of Lower Sydney Harbour during dredging of sediments for installation of the ITT and during operation of support works in Berrys Bay, Snails Bay and White Bay.

Neither the EIS nor the subsequent Submissions Report documented procedures to minimise the dispersion of fine-grained contaminated and contaminated sediments during dredging so that no significant risk would be posed to the marine ecosystem, including fish, crustaceans, sea grass and kelp and to the health of recreational users of Snails Bay, Iron Cove (Dawn Fraser pool and Balmain Sailing Club), and Berrys Bay. This critical requirement of the SEARS was not addressed in the EIS and in the subsequent Submissions Report.

Given the depth of water and the strong currents within the alignment of the ITT, silt screens may be required to be installed around only small segments of the ITT alignment, not directly across the current direction/s and moved along the alignment when dredging is completed in each segment.

Corrective actions

The EPA must urgently require TfNSW to provide a program of corrective actions to be implemented if unacceptable concentrations of sediment and/or dissolved chemicals of potential concern have migrated from the area of the silt curtains deployed around segments of the alignment of the ITT and at test locations nominated by the EPA near the Dawn Fraser swimming pool, Snails Bay, Berrys Bay and White Bay.

EPA's requirements to be provided urgently

The EPA must urgently make available their requirements for performance criteria and corrective actions to be implemented prior to commencement of on-water components of installation of the ITT.

To address concerns of the community, the EPA's requirements are required to be made available urgently to TfNSW and to the public.

Engagement and duties of an environmental consultant

The EPA must require TfNSW to engage an experienced independent consultant to prepare plans for managing environmental protection measures and contingency measures in the event of a breach of the EPA's requirements during dredging of both contaminated and uncontaminated sediments within the alignment of the ITT and transit of vessels within construction support sites at Snails Bay, Berrys Bay and White Bay.

As a component of the independent consultant's requirements during the dredging works, the EPA must require results of monitoring at high and low tides of sediment concentrations that have dispersed from the dredging areas and results of monitoring and of any measures are made available to the community in a timely manner to allow the community to have confidence in the effectiveness of the environmental protection measures.

Prior to the commencement of dredging operations the environmental consultant engaged by TfNSW must prepare a monitoring program that is endorsed by the EPA. The monitoring program must contain corrective measures that will be employed in the event that dispersed sediments are identified outside the area of the silt curtains at concentrations exceeding those permitted by the EPA.

The EPA must ensure TfNSW requires the independent consultant to be in attendance during each day of works where contaminated and/or uncontaminated sediments are likely to be disturbed in areas that include the corridor of the ITT and shallow waters less than 10 metres depth in construction support sites in Snails Bay, Berrys Bay and White Bay that will be transited by vessels, including ocean-going barges.

The EPA must ensure TfNSW requires the independent consultant to monitor and report daily compliances/non-compliances with the EPA's requirements and, if required, on the implementation of contingency measures in the event of loss of dredged sediments from all work areas where sediments have been and are likely to be disturbed for the duration works in these areas.

On-shore contaminated sites

Although the EIS identified 18 on-shore sites along the alignment of tunnelling for the WHT project to have either a moderate or high risk of contamination, no environmental investigations were undertaken to characterise and assess the impact of risk posed by the contamination.

With respect to the on-shore component of the WHT, the EIS should have been rejected by both the DPIE and the EPA because no environmental investigations had been undertaken on on-shore areas of identified environmental concern in compliance with guidelines made but the EPA ,

resulting in the environmental impacts being unquantified and thereby not permitting the impacts to the environment and human health to be assessed by the EIS.

The failure of the EIS to document and assess the risks posed to the community by contamination on the 18 sites identified in the EIS has not allowed the community.

The EPA must urgently require TfNSW to engage experienced environment consultants to carry out environmental investigations of sites identified in the EIS as potentially contaminated, and, if significant contamination is identified, that the risk to human health and to the environment be assessed and the risks can be mitigated.

As stated in the EPA's submission to the EIS, the EPA must require a site auditor review reports prepared by the consultants and, if contamination is identified, the site auditor must issue an appropriate Site Audit Statement at the completion of remediation works.

Results of environmental investigations and assessments of the risks posed by any significant contamination are required to be made available by TfNSW to the public as soon as practicable.

Requirement for TfNSW to stablish a dedicated website

The EPA must require TfNSW to establish and maintain a website dedicated to the ITT project and be accessible to the public and on which documents progress of dredging, results of daily monitoring and any non-conformances to the EPA's requirements and any corrective actions implemented.

The website should also provide the community with a means of addressing concerns of their concerns.

13 Requirement of the WHT project to meet community expectations

Given the flaws in the EIS and in the Submissions Report and the weak response to date from the EPA in providing their requirements, the community's confidence that the ITT and related works can be completed with minimal impact to the environment remains low.

In my opinion, if the EPA addresses the issues raised in this submission and makes their requirements known to the public urgently, the confidence of the community in the successful completion of the ITT and ancillary programs will be increased substantially and the installation of the ITT will progress in an environmentally sound manner and will have increased probability of being completed within budget and time expectations of TfNSW.

Annexure A. Deployment silt curtains in strong currents and deep water

ABASCO LLC, Humble, Texas, USA

Strong Current Dredging Project

February 27, 2018

Location: Biscayne Bay, Watson Island, Miami, Florida

Project Overview: Contain bucket dredge sediments within several work zones exposed to high tidal currents, limit sediment migration at several defined mitigation areas, adjacent Miami Cruise Ship Terminal with requirement for frequent barge traffic.

Provided 30,300' of Heavy Duty Type 3* curtains along with specialty turbidity curtains in assigned project areas.

ABASCO Contribution: Design engineering, manufacture & site support

- TYPE 2 DOT with 3/8" chain used in interior mitigation areas
- TYPE 3 HD with ½" chain used in primary dredge area and outer mitigation
- TYPE 3 HD* with additional belting in primary dredge area
- Custom heavy curtains – 35 oz PVC, 2 each ½" chains for high load areas
- High tensile strength belting, D-rings and fasteners used on some higher load areas

Project Challenges and Features

- Type 3 HD* and specialty curtains exposed to 4-5 knot currents
- Strong winds up to 45mph
- Release restricted to low NTU levels, multiple samplings per day
- Pilings and deadweight anchors
- Curtain restrictions related to Manatee** movements
- Dredge area, sponge/seagrass mitigation areas, and spoils area
- Fine silt coral sediment in the dredge area (baby powder)
- High profile location

*Type 3 curtains – suitable for harbour and open water. Skirt depths up to 20 metres. Long-term deployment and rough conditions

**Sea cow