

Supplementary  
Submission  
No 448a

## INQUIRY INTO IMPACT OF THE WESTERN HARBOUR TUNNEL AND BEACHES LINK

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# **Additional Evidence to the NSW Upper House Inquiry into the Western Harbour Tunnel Project**

Dr Bill Ryall  
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## **Reasons for additional evidence**

Since making my submission to the Upper House Inquiry into the Western Harbour Tunnel project, I have prepared a paper that proposes:

- a superior method for removal of contaminated sediments from the alignment of the Immersed Tube Tunnel replacing the method proposed in the EIS to dredge contaminated sediments. This method eliminates the pollution of contaminated sediments into the waters of Sydney Harbour;
- a superior method for minimising the dispersion of uncontaminated sediments into the waters of Sydney Harbour during dredging. This method minimises the pollution of waters of Sydney Harbour by dispersion of uncontaminated sediments into the waters of Sydney Harbour;
- improvements to the EPA's input to:
  - establishing rigorous SEARS to be addressed in an EIS
  - review of environmental protection measures in an EIS

Adoption of the changes proposed above will result in much lower costs and shorter time for removal, transport, treatment and disposal to landfill of contaminated sediments and rigorous environmental protection measures being understood at an early stage of the approval process by the community and by contractors who may bid for the project.

## ***No engagement by TfNSW to resolve reliable volume estimates of contaminated sediments***

After making a submission to the EIS challenging the volume of contaminated sediments documented in the EIS and subsequently meeting with TfNSW, I expected TfNSW would engage with me to resolve the true volume of these sediments, which has direct relevance to the following terms of reference of the Upper House Inquiry:

- “(c) the cost of the project, including the reasons for overruns” arising from:
  - the EIS grossly overstating the volume of contaminated sediments required to be removed, transported, treated and disposed to landfill, thereby leading contractors overpricing their proposal for the works.
  - the EPA not setting out in the SEARS and in their review of the EIS their requirements for protection of the marine ecosystem during dredging, transporting and treating contaminated sediments, their requirements leading contractors under-pricing their proposal for the works, but later seeking cost and time variations when the EPA's requirements are imposed after contract award.
- “(j) the impact on the environment, including marine ecosystems” arising from:
  - The very large volumes of contaminated and uncontaminated sediments documented in the EIS to pollute the waters of Sydney Harbour during dredging within the alignment for installation of the Immersed Tube Tunnel.

The additional evidence is also provided to document my frustration by the continued indefensible position of TfNSW that the volume of contaminated sediments documented in the EIS is correct.

TfNSW's position on this aspect to the WHT project will give rise to very substantial cost and time penalties.

In addition, TfNSW have not addressed the requirement for dredging highly contaminated sediments for the western part of Berrys Bay that is proposed to be used for Construction Support Site WH7. Due to the shallow water in this part of Berrys Bay, transit of laden barges will mobilise highly contaminated sediments into the waters of Sydney Harbour and result in significant impacted to the marine ecosystem.

### ***Telephone conference with the Minister for the Environment***

Following lodgement of my submission to the Upper House Inquiry and not receiving any contact from TfNSW, my local MP, Mr Jamie Parker arranged a telephone meeting for me with the Minister for the Environment, Mr Matt Kean. A senior officer of NSW EPA, \_\_\_\_\_, was also present at the meeting. This meeting took place on 12 July 2021.

The outcome of the meeting was that \_\_\_\_\_ and I would discuss the issues raised by me in a further telephone meeting. Prior to the meeting with \_\_\_\_\_, I sent a paper documenting details of my concerns with \_\_\_\_\_. The telephone meeting took place on 22 July 2021.

On 19 August 2021 I received a letter from the EPA signed by \_\_\_\_\_ that addressed my concerns in relation to the very large volumes of contaminated and uncontaminated sediments the EIS stated would be "lost" to the waters of Sydney Harbour. In this regard, the EPA's letter stated "I have written to the Transport for NSW enquiring further about this issue".

As of the date of this additional evidence, I have not received a response from the EPA or TfNSW.

### ***Weak submission by NSW EPA to the EIS***

The Secretary's environmental assessment requirements (SEARS) for the WHT EIS were too generalised and did not provide appropriate requirements for the EIS to address protection of the marine environment and the health of recreational users of parts of Sydney Harbour impacted by the dispersion of contaminated and uncontaminated sediments into the waters of Sydney Harbour during dredging of these sediments.

The weak submission by the EPA relating to its requirements for protection of the marine environment, which is the most environmentally sensitive component of the WHT project, was weak and gave rise to great concern to the communities of Balmain, Birchgrove and Rozelle relating to pollution of waters of Sydney Harbour and the health of recreational users of waters impacted by dispersion of sediments by dredging.

My proposal for a superior way forward is contained in the Paper, below.

## **Paper in relation to issues of concern**

### **Western Harbour Tunnel Project – Installation of the Immersed Tube Tunnel**

#### **Issues of concern and a superior way forward**

Dr Bill Ryall

#### **Summary**

As a component of the complex Western Harbour Tunnel (WHT) project, Transport for NSW (TfNSW) proposes to install an Immersed Tube Tunnel across Sydney Harbour extending from Yurulbin Point, Birchgrove, to the disused Coal Loader at Waverton, a distance of approximately 750 metres.

The Immersed Tube Tunnel involves placement of prefabricated concrete tubes into an excavation formed by dredging of contaminated and uncontaminated sediments from the floor of Sydney Harbour.

The ITT would be joined to tunnels bored within sandstone bedrock from Rozelle to Birchgrove and from Waverton to North Sydney.

According to the WHT EIS, dredging for installation of the Immersed Tube Tunnel will remove by dredging almost 1 million cubic metres of sediments comprising:

- 142,500 cubic metres of contaminated sediments, which will be transported by barges to a contaminated sediment treatment works at White Bay and subsequent disposal to landfill; and
- 823,000 cubic metres of uncontaminated sediments, which will be transported by barges to and off-shore dumping site to be approved by the Commonwealth Government.

Installation of the Immersed Tube Tunnel is the most environmentally sensitive component of the WHT project because of the significant risk posed by dispersion of large volumes of sediments and dissolved contaminants into the waters of Sydney Harbour resulting in an unquantified risk of pollution of the marine ecosystem and of risk to the health of recreational users of the harbour within the plumes of dispersed sediments and dissolved contaminants.

The WHT has been deemed to be a project of State Significant Infrastructure.

Because of significant errors and uncertainties in the EIS, I have proposed alternative measures which, if adopted by Transport for NSW, NSW Department of Planning and the NSW Environment Protection Authority, will result in large savings in time and cost for the installation of the Immersed Tube Tunnel component of the WHT project and will result in negligible dispersion of contaminated sediments into the waters of Sydney Harbour, treatment of far less contaminated sediments at the White Bay contaminated sediment treatment works, disposal of much less treated contaminated sediments to landfill and benefits to the amenity of the community.

### **Proposal for an alternative to the method documented in the EIS for removal of contaminated sediments from within the alignment of the ITT**

The dredging of contaminated and uncontaminated sediments proposed in the EIS is the most environmentally sensitive component of the WHT project and warrants thorough scrutiny and documentation at the EIS review stage of requirements of regulators.

Concern in respect to this important issue arises from the weak response to the EIS by the EPA relating to the methods proposed in the EIS to dredge 965,000 cubic metres of sediments comprising approximately 142,500 cubic metres of fine-grained contaminated and 823,000 cubic metres of uncontaminated sediments. The EIS stated dredging would result in discharge into the waters of Sydney Harbour of 15,100 cubic metres of uncontaminated sediments.

### ***Community concern with the EPA's weak requirements in relation to dredging of contaminated sediments***

The EPA's response to this component of the WHT project comprised only one and one-half pages of request, not one requirement, and was dated on the last day allowed for submissions of the EIS.

The community are concerned the sediments discharged during dredging would pose a significant risk of harm to the marine ecosystem and to passive recreational use of waters where currents have transported dispersed sediments away from the dredging areas.

The community are further concerned that the weak and last day response to the EIS by the EPA in relation to environmental protection measures required to be implemented during dredging of contaminated and uncontaminated sediments from the floor of Sydney Harbour, is in stark contrast to their comprehensive response by the EPA to environmental protection measures required to be implemented for potentially on-shore contaminated land.

This response by the EPA, dated 12 March, comprised 18 pages of the EPA's requirements related to further investigation and environmental protection and management measures and is of an acceptable scope to deliver comfort to the community that their concerns for protection of the environment and their health and amenity have been addressed.

By contrast to on-shore contamination, the community is deeply concerned that the EPA's weak response to the EIS in relation to environmental protection measures relating to the dredging, transport, treatment and disposal of contaminated sediments to landfill have not been addressed appropriately to what they consider to be most environmentally sensitive component of the WHT project.

### ***Incorrect volume of contaminated sediments***

The lack of a reliable estimate in the EIS of the aerial and depth extents of contaminated sediments and their volumes, which will, if adopted, 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 serious cost and time overruns arising from inaccurate volumes of contaminated sediments being dredged, transported and treated at the White Bay contaminated sediment treatment plant, disposal of unnecessary quantities of sediments to landfill and for prolonging unacceptable impacts to the amenity of the community.

I have consistently stated in my submissions to the EIS and in a meeting with Transport for NSW (TfNSW) the volume and distribution of contaminated sediments required to be dredged to allow installation of ITT as part of the Western Harbour Tunnel (WHT) project is incorrectly stated in both the EIS and in the subsequent Submissions Report.

Despite my informing TfNSW of the incorrect volumes, areal and depth extents of the contaminated sediments, TfNSW has consistently defended the volume of contaminated sediments documented in the EIS and in the Submissions Report and rejected my position.

The incorrect volume of contaminated sediments gives rise to significant impacts to the method for removing the contaminated sediments and the cost, duration, volume of sediments to be treated at the White Bay contaminated sediment treatment works and the volume of treated contaminated sediment disposed to landfill and impact to the amenity of the community.

The ITT component of the WHT project cannot be delivered effectively and efficiently if the nature and extent of the contaminated sediments have not been assessed thoroughly at the EIS review stage by regulators, most importantly by the EPA.

At the meeting with TfNSW at their North Sydney office on 7 August 2000 to seek further explanation relating to a number of issues I had with the EIS, TfNSW again stated the volume of 142,500 cubic metres of contaminated sediments along the entire length of the ITT to a depth of 1.5 metres, as documented in the EIS, was correct and was the volume of contaminated sediments proposed to be dredged, treated at the White Bay sediment treatment works (WHT3) for subsequent disposal to landfill.

Despite the statement by their consultant in relation to the inaccurate volume of contaminated sediments, Transport NSW has repeatedly dismissed my concerns relating to the inaccurate volume of contaminated sediments and has insisted the volumes documented in the EIS and the Submissions Report are correct.

The volume of contaminated sediments is incorrect as sediments within a significant part of the alignment of the ITT are not contaminated and sediments in only a small part of the ITT alignment have been reported in the EIS at depths of 1.5 metres below the seafloor.

However, at the above meeting, TfNSW's consultant agreed that the volume of contaminated sediments documented in the EIS was incorrect and that no contaminated sediments were present across the central part of the alignment of the ITT because these sediments had been evidently washed away by strong currents prevalent at the central part of the alignment of the ITT. This statement by the consultant agreed with my position relating to the distribution of the contaminated sediments.

To review how the volume of contaminated sediments was derived for inclusion in the EIS, I requested on 7 August 2020 and again by email on 22 July 2021 for TfNSW to provide me with a copy of a report by their consultants confirming TfNSW's position that the volume of contaminated sediments and their aerial and depth extents documented in the EIS and Submissions Report were correct.

I was informed by TfNSW at the meeting on 7 August 2020 and again by email on 29 August 2021 that "TfNSW NSW had not produced a Contamination Interpretation Report".

In the many assessment and remediation projects I have been involved in as an assessor, advisor and site auditor over almost 30 years, including major sediment remediation projects at Homebush Bay ((i) dioxin remediation and (ii) lead remediation), Newcastle Harbour (coking coal waste remediation) and Kendall Bay (gasworks waste remediation), I have never encountered the volume of contaminated sediments having been estimated reliably without the use of plots of test locations and the results of chemical analyses of sediment/soil at each depth interval at each sampling location being subjected to statistical analysis.

The Submissions Report, one of the principal purposes of which was to address submissions made to the EIS by regulatory authorities and the public, published after my meeting with TfNSW, perpetuated the incorrect volume of contaminated sediments.

As TfNSW had not determined the volume of contaminated sediments within the alignment of the ITT using the industry-recognised procedure, it is misleading to have documented in both the EIS and Submissions Report a volume of contaminated sediments which wildly overestimates the true volume.

The incorrect volume of contaminated sediments gives rise to significant impacts to the method for removing the contaminated sediments and the cost, duration, volume of sediments to be treated at the White Bay contaminated sediment treatment works and the volume of treated contaminated sediment disposed to landfill and impact to the amenity of the community.

### ***Change to alignment of the ITT***

In addition, the TfNSW Submissions Report documented that the alignment of the south-western part of the ITT had been changed. However, data in the Submissions Report relating to the locations of sampling points, the depths of samples analysed for chemicals of potential concern were not appropriate to allow a reliable estimate of the nature, extent and volume of the contaminated sediment in the revised alignment. With respect to the revised alignment, TfNSW informed me "The project team has advised that the alignment refinement is small and the sampling and testing still captures the material that we expect to be excavating in the harbour". However, no justification for TfNSW's assertion was provided.

The ability of the alternative method to deliver significant benefits to the ITT component of the WHT project relies on my detailed assessment of results documented in the EIS that show the volume and distribution of the contaminated sediments stated in the EIS and perpetuated in the Submissions Report is incorrect.

Serious cost, time and amenity issues arise from the inaccurate volume of contaminated sediments and their locations within the alignment of the ITT documented in the EIS and perpetuated in the Submissions Report.

### ***Locations of contaminated sediments***

My detailed assessment of results of the Marine Investigations (Appendix M of the EIS) indicated contaminated sediments were located predominately in locations where coffer dams were proposed to be installed adjacent to Yurulbin Point (WHT 5) and to the Waverton Coal Loader (WHT6).

The EIS proposed the two coffer dams to be constructed within driven, steel sheet pile walls, to produce a temporary water-tight enclosure to prevent ingress of sea water at the locations where the ITT will be joined to the on-shore tunnels that have been bored through sandstone bedrock.

The locations of the proposed coffer dams encompass almost all of the contaminated sediments. The presence of the contaminated sediments in these locations is apparently due to these areas being protected from erosion by strong currents known to be present in the central part of the harbour.

The alternative method proposed I propose for removal of the contaminated sediments relies on using the virtually water-tight sheet pile walls of the coffer dams that will effectively isolate the contaminated sediments, which can be removed by a backhoe, as proposed in the EIS. If required, the dimensions of the sheet piling could be increased to contain the full extent of contaminated sediments, adjacent to both Yurulbin Point and the Waverton Coal Loader.

If required for access, an opening in walls of the two sheet pile enclosures could be maintained and protected by a full-depth silt curtain, which can be opened to allow access for a backhoe dredge of the type proposed in the EIS.

In support of using sheet piles to contain sediments required to be removed as part of a major remediation program, it is noted remediation of contaminated sediments in Newcastle Harbour (Hunter River), adjacent to the former BHP steelworks, were undertaken successfully within a sheet pile enclosure.

If adopted, the alternative method will result in:

- negligible contaminated sediments being dispersed into Sydney Harbour in contrast to the large volume of sediments being dispersed by dredging as proposed in the EIS
- very large decrease in the volume of sediments required to be excavated, transported to and treated at the White Bay contaminated sediments treatment works
- very large decrease in the volume of sediments required to be transported and disposed to landfill
- very large decrease in the time required to remove contaminated sediments
- significant cost reduction
- significant time reduction
- better addressing concerns of the community

## **Proposal for a method to reduce unacceptable dispersion of uncontaminated sediments into waters of Sydney Harbour during dredging along the ITT alignment**

### ***Inadequacy of shallow silt screens during dredging in Sydney Harbour***

Dredging of contaminated and uncontaminated sediments along the alignment of the ITT, and the dispersion into the waters of Sydney Harbour was documented in the EIS to result in an estimated 2,100 cubic metres of contaminated and an estimated 15,000 cubic metres of uncontaminated sediments and an unquantified volume of dissolved contaminants being dispersed into the waters of Sydney Harbour during dredging.

Harbour during dredging at depths more than 8 metres below the extent of the silt curtains.

Dredging documented in the EIS raised serious concern that the pollution of Sydney Harbour by the fine-grained sediments would result in a serious risk of harm to the marine ecosystem principally by suffocation of sea grasses, kelp and crustaceans and by ingestion by fish and to the health of passive human users of waters within the plumes of contaminated and uncontaminated sediments.

The EIS proposed environmental protection measures to contain uncontaminated sediments dispersed by dredging by installation of a shallow silt curtains that extend only 2 to 3 metres below the sea surface in waters that range from 11 to 15 metres deep and in the central part of the ITT alignment are characterised by strong tidal currents that are expected to disperse sediments being excavated at the seafloor.

There is concern that the shallow silt curtains proposed to limit dispersion of dredged sediments, described in the EIS are inadequate.

The EPA in their review of the EIS did not comment on the acceptability of the dispersion of large volumes of fine-grained sediments, nor did they set out water quality objectives, monitoring and reporting requirements to be implemented by the remediation contractor.

To minimise the volume of uncontaminated sediments being dispersed into the waters of Sydney Harbour during dredging, I have proposed that full-depth silt curtains be installed.

Full-depth silt screens have been used successfully in waters as deep and as fast moving as are present along the alignment of the ITT.

### **Requirement to remove highly contaminated sediments in shallow waters of Berrys Bay**

The EIS did not identify the significant risk of harm posed to the marine ecosystem and to passive recreational users of Berrys Bay by dispersion into the waters of highly contaminated sediments in shallow waters within the proposed construction support site during transit of vessels within construction support site WHT7.

Sediments in shallow waters of western Berrys Bay are contaminated by very high concentrations of marine antifoulant that are highly toxic to the marine ecosystem (tributyltin (TBT), polynuclear aromatic hydrocarbons, mercury and copper). These contaminants are present within the sediments as a result of water blasting of highly toxic anti-foulant chemicals from the hulls of vessels.

It is noted the EIS stated at Chapter 17 "Vessel movements have the potential to generate localised plumes of excess suspended sediments associated with vessel wash in shallower waters, generally less than five to ten metres water depth". Most waters within the location of the proposed construction support site in the western part of Berrys Bay are shallower than 9 metres and off-shore from the former Woodleys Boast Shed waters are shallower than 5 metres.

It is expected that barges laden with sandstone rock excavated from the Waverton to North Sydney tunnel traversing across the construction support site WHT7 in western Berrys Bay will have drafts (depth below water line) of approximately 4 metres and thereby be very close to the seafloor. Consequently, highly contaminated pose a high risk of being dispersed into the waters of Berrys.

This issue was not addressed in either the EIS or the Submissions Report and was not addressed by the EPA in their submission to the EIS.

Highly contaminated sediments in shallow waters of western Berrys Bay have a high risk of being disturbed by transit of vessels are required to be removed prior to operation of the construction support site proposed for western Berrys Bay and are required to be treated at the White Bay contaminated sediment treatment works for disposal to landfill.

It is important for the protection of the marine ecosystem and passive recreational users of Berrys Bay that contaminated sediments in shallow waters of western Berrys Bay are removed prior to use of construction support site WHT7.

### **Early notification in project SEARS of EPA's requirements for protection of the environment and human health**

The EPA did not document a detailed review of impacts to the environment and human health at the EIS review stage and did not mandate measures required by the EPA to be implemented to protect the marine ecosystem, the health of passive users of waters of Sydney Harbour and the amenity of the community.

In particular, the EPA failed to state in their review of the EIS whether the dispersion into the waters of Sydney Harbour during dredging along the alignment of the ITT of a total of approximately 17,000 cubic metres of contaminated and uncontaminated sediments is acceptable in accordance with Water Quality Objectives providing protection of waters of Sydney Harbour.



The SEARS documented in the EIS referring to removal of contaminated sediments within the alignment of the ITT as a construction project whereas removal of the contaminated sediments was required to be addressed as a remediation project, subject to requirements of the Contaminated Land Management Act 1997 and guidelines made under this act.

The EPA did not in their review of the EIS document the inadequacy of the SEARS in relation to remediation of contaminated sediments.

The Rapid Assessment Framework, described below, provides the means for the EPA to provide their requirements for SEARS for all projects where a significant risk is proposed to the environment and/or to human health.

## **Rapid Assessment Framework proposed by the Department of Planning**

### ***Improved Secretary's environmental assessment requirements (SEARS)***

In July 2021, the Department of Planning advised of the implementation of the Rapid Assessment Framework (RAF) for State Significant Development (SSD) and State Significant Infrastructure (SSI) projects and that "The reforms will improve the quality, efficiency and transparency of SSD and SSI assessments and administration, ensure applications and reports are prepared to a consistently high standard, improve the quality of community engagement, and introduce formal quality assurance measures for environmental assessment reports".

The RAF proposed that 'industry-specific SEARS' that have been prepared in advance in consultation with relevant public authorities which will enable the issue of SEARS "in just 7 days, instead of the 28-day timeframe otherwise provided ...for projects that are consistent with underlying land use zoning and include impacts that are well understood and can be mitigated."

A principal benefit of the RAF envisaged "...it also means that the Department and other public authorities can focus time and effort on preparing SEARS for higher risk and higher impact SSD and SSI projects."

It is envisaged the WHT project would trigger the requirement under the RAF process as a high risk and impact project.

The RAF process has merit if it allows the EPA to have:

- detailed technical input to SEARS for projects where significant risk of impact may result to one or more of the environment, human health and the amenity of the community;
- the SEARS require detailed description of environmental protection measures required to be detailed in the EIS, including an outline of the environmental monitoring plan, which must include the water quality objectives, the monitoring program, corrective actions in the event of a non-conformance, reporting to regulatory authorities to and community; and
- reviewed the Submissions Reports to ensure issues raised in submissions to the EIS by regulatory authorities and the community have been fully to meet the EPA's requirements.

### ***Benefits of early notification by EPA for environmental protection measures for future projects***

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 cost allowances for measures that protect the marine ecosystem and for monitoring, implementing corrective measures and reporting only when the EPA provides its requirements for environmental compliance in relation to relevant Water Quality Objectives and other compliance imperatives

- monitoring the effectiveness of environmental protection measures during:
  - dredging of contaminated and uncontaminated sediments
  - transport of contaminated and uncontaminated sediments
  - operation of the White Bay contaminated sediment treatment works
  - transport of treated contaminated sediments to landfill
- corrective actions in the event of a malfunction
- reporting results of monitoring programs in a timely manner

The EPA's requirements for must be included in the tender documents so that contractors are able to allow realistic methodologies, costs and times for each of the above measures in their tenders.

The EPA's notification of their requirements for environmental protection, as part of their review of the EIS, will minimise 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 tenders and in following tender documents.

It is not sufficient for the EPA to impose their environmental protection requirements after the contractor has been engaged, as experience demonstrates cost and time escalations follow where unidentified requirements are put to the contractor after engagement of the contractor.

If properly implemented, the Rapid Assessment Framework will result in the EPA having a more comprehensive input to into SEARS and should result in a thorough review of the EIS by the EPA by making known their requirements for protection of the environment prior to issue of requests for tender.

The RAF process will result in more comprehensive input to into SEARS and, if implemented, should result in a thorough review of the EIS by the EPA which will give rise to more reliable contracts for major projects.