walker

TOONDAH HARBOUR

CHAPTER 6

THE IMPACT ASSESSMENT PROCESS

saunders havill group

6. The Impact Assessment Process

Volume 2 of the Toondah Harbour Project EIS characterises the existing environmental values at Toondah Harbour and surrounding areas (in some cases this extends to the whole of Moreton Bay) and addresses the potential for the Project to impact on those environmental values. The impacts discussed in this volume are based on site-specific studies and published knowledge of the species and habitats present in and adjacent the study area.

Under the *Environment Protection and Biodiversity Conservation Act 1999* (EPBC Act) significant residual impacts to matters of national environmental significance (MNES) are assessed using criteria outlined in the *MNES Significant Impact Guidelines 1.1*. Assessment of the potential for significant impacts to MNES is included in Volume 3.

The environment assessment process is a risk assessment carried out in five steps:

- Identification of potential risks to the environment resulting from the action. Impacts may be **direct** (for example removal of vegetation or habitat to create infrastructure) or **indirect** (for example the creation of sediment plumes in the water column that may damage habitat outside the Project footprint);
- Description of the existing environment to understand what environmental, economic and social values may be impacted by the action;
- Quantification of how the potential risks/impacts may change the environmental values identified. This may be as simple as identifying an area of habitat removed by the Project or a more complex analysis of changes to physical and chemical environment and how they might interact and affect the environmental values over time;
- Identification of management measures to avoid and minimise the potential for risks/impacts to occur. Management measures should also specify any associated monitoring of environmental values so that the effectiveness of the measure can be assessed and, where required, modified to ensure the best outcomes. This is often referred to as **adaptive management**; and
- Where significant residual risks/impacts to an environmental value remain after avoidance and management measures are applied, a compensatory measure is required to show the action will result in an overall benefit to the environmental value being affected. In Australia this is generally referred to as an **environmental offset**.

Impacts from an action can be both positive and negative. New infrastructure and developments often improve economic, social and recreational values through the creation of jobs, improved open space and upgrades to transport infrastructure. Through good design and compensatory measures an overall benefit to the environmental values of a region can be achieved.

Volume 2 of the Draft EIS has been divided into multiple chapters to address various environmental and social matters. Site specific technical studies completed include:

- Soils, Sediments and Contaminated Land;
- Coastal Processes;
- Surface Water;
- Groundwater;
- Air Quality;
- Terrestrial and Underwater Noise and Vibration;
- Artificial Lighting;
- Waste Management;
- Terrestrial Ecology;
- Marine Ecology;
- Migratory and Threatened Shorebirds;

- Indigenous and Non-Indigenous Cultural Heritage;
- Commercial and Recreational Fisheries;
- Social Environment; and
- Economic Environment.

Each technical assessment has been completed by an independent consultant and compiled and edited by Saunders Havill Group (SHG). The technical consultant responsible for the section is noted in the section introduction and key team members listed in Appendix 1-F.

6.1. Impact Assessment Structure

Each chapter is set out following the same structure and process to provide consistency in approach. Key assessment stages are outlined below.

6.1.1 Identification of Activities that May Result in Impacts

Project activities with the potential to impact on existing environmental, social and economic values are identified upfront in each chapter to provide context to the assessment approach with the key activities listed below. The potential impacts resulting from these activities are dependent on a range of variables which are addressed in detail in each technical chapter.

- Reclamation and maritime construction works:
  - Excavation of mud, sheet piling and placement of rock to construct the bund walls;
  - Installation of permanent and temporary sheet piling for the bund walls;
  - Installation of vertical piles within the marina and harbour areas;
  - Increased truck movements to and from the site to import clean rock for the bund walls;
  - Dewatering of the bunded area;
  - Reclamation of land which will replace previous intertidal mudflat habitats with a landform above tidal limits;
  - Suspension of sediment disturbed within the reclamation areas into tailwater collected from the dewatering process;
  - Potential for spills of fuel and other chemicals;
  - Changes to coastal processes (currents, waves, etc) due to the physical barrier created by the reclamation;
  - Creation of ambient and underwater noise and vibration during construction activities such as pile driving and excavation;
  - Reduced air quality through dust generation from construction vehicles and reclamation areas once fill material has been fully de-watered;
  - Short term increases in artificial lighting around the temporary unloading dock during dredging activities.

- Dredging:
  - Removal of sub-tidal and intertidal areas through expansion and deepening of the existing harbour entrance channel (the Fison Channel) and turning basin;
  - Suspension in the water column of any contaminants and nutrients, including acid sulfate soils (ASS), from the sediment being dredged;
  - Potential for spills of fuel and other chemicals;
  - Creation of temporary suspended sediment (turbidity) plumes in the water column during dredging and loading of barges with sediment;
  - Settlement of the suspended sediment from the water column to the substrate;
  - Creation of ambient and underwater noise and vibration during the dredging process;
  - Increased vessel movement during dredging including the dredger, barges and support vessels.

- Building and civil works (onshore and within the reclamation):
  - Ambient noise from structural piling, building and civil works;
  - Dust generation from building and civil works;
  - Clearing of a small amount of vegetation for onshore works;
  - Increased vehicle traffic to and from the construction site, in particular during building construction;
  - Stormwater runoff from civil and building construction areas that may transport surface soils or contaminants into drainage lines and ultimately Moreton Bay;
  - Disturbance of potentially contaminated soils within the Project footprint;
  - Potential for spills of fuel and other chemicals;
  - Generation of waste materials from the building and construction process.

- Ongoing use of the ferry terminal, marina and urban development:
  - Increased human use of the foreshore parks, walking tracks and open space including increase in domestic pets present in these facilities;
  - Increase in vehicle traffic to and from Toondah Harbour;
  - Increase in the size and frequency of boat movements in Toondah Harbour;
  - A general increase in ambient light and noise resulting from new uses;
  - Potential for spills of fuel and other chemicals;
  - Potential for long term degradation of water quality from stormwater runoff and stagnation of water within the marina and internal waterways;
  - Ongoing maintenance dredging of the Fison Channel, turning basin, internal waterways and the marina (maintenance dredging is currently carried out regularly for the Fison Channel and turning basin);
  - Increased waste generation from residential, retail and commercial activities.

6.1.2 Description of the Existing Values

Each study includes a description of the existing values and outlines the methods used to identify these values. Methods differ depending on the technical area being assessed. Physical processes such as coastal currents and air quality are described by collecting site data and using it to calibrate numerical models, whereas marine habitats and migratory shorebirds are assessed through seasonal surveys that, in some instances, have been carried out over several years. All studies utilise existing data from peer-reviewed sources to supplement the site-specific studies.

6.1.3 Quantification of Potential Impacts

This section quantifies the likely impacts to the existing values as a result of the identified risks. For direct impacts this is a relatively simple process and may include calculation of areas of habitat to be removed by the Project. For indirect risks it can be more difficult to predict the exact extent of impacts, however a range of tools have been used including predictive numerical modelling, conceptual modelling, review of impacts from similar activities and use of expert opinion from professionals with over 20 years' experience in their technical fields.

6.1.4 Adaptive Management and Monitoring Measures

As the Project will be constructed in stages over a period of up to 20 years and operations will persist for the foreseeable future, it is neither realistic nor possible to develop prescriptive management measures that can apply over the entire construction period, or ongoing use of the site. Monitoring programs may find impacts differ from what has been predicted. New information on species and habitat including improved management techniques are also likely to become available over the duration of the Project. As a result, it is imperative that site management is flexible and can be modified over time to address any emerging risks and opportunities.

To reflect this an adaptive management approach will be adopted which will allow future research and best practice development to be undertaken and integrated into the management, mitigation, and monitoring of the Project (see Figure 6-1).

The Environmental Management Framework (EM Framework) for the construction and operation of the Project will be reviewed on an annual basis or sooner if a response to any non-compliances is required (e.g., if water quality criteria for dredging is consistently exceeded, then dredging may be temporarily suspended and the framework reviewed to incorporate more stringent management measures such as using additional silt curtains). The review process will ensure the EMPs reflect the most up-to-date science and management techniques. The outcomes of the review, including any modifications made to the EMPs, will be addressed through an annual compliance report (ACR), which will be publicly available. An advisory panel made up of recognised leaders in their technical fields will be commissioned to oversee the review process and ensure changes to the management program reflect the latest industry knowledge and good practice at the time of review.

Each Draft EIS chapter will include management measures targeted at reducing the likelihood and severity of risks to environmental values. For each management measure, commentary will be included on the likely effectiveness of the measure to avoid or minimise impacts. Measures based on scientific data from multiple independent sources or that have demonstrated good management outcomes across multiple projects will be considered more effective than measures that are not used widely or untried.

For each management measure, associated monitoring will also be identified to facilitate the adaptive management process. Through this process, measures considered to have low effectiveness could demonstrate good outcomes or vice versa. EMPs would then be updated to reflect these outcomes.

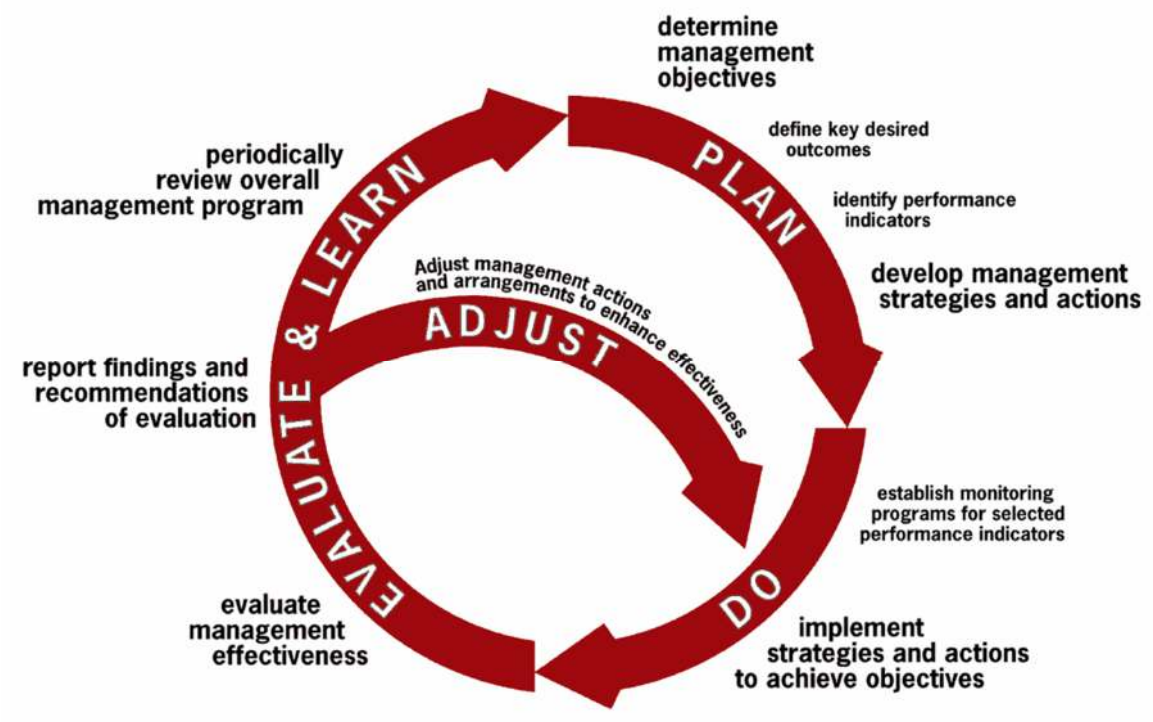

Figure 6-1: Adaptive Management Process (source: CSIRO).

6.1.5 Residual Impact Risk Assessment

Once potential impacts to environmental values have been quantified and management measures outlined to avoid or minimise those impacts, an assessment will be carried out to review the residual risk to environmental values using the criteria outlined in Table 6-1 to Table 6-4. Risk assessment assumes all management measures specified are implemented and considers the likely effectiveness of the proposed measures.

Table 6-1: Scale of Impact.

Scale	Definition
National / International Scale	Impacts will occur at the flyway or nationally important population scale for a species
Regional Scale	Impacts will occur beyond the Project footprint and immediate surrounds (potentially across several habitat types)
Local Scale	Impacts will occur within the Project footprint and immediate surrounds but will not have any measurable effect outside of this area
Site Scale	Impacts will only occur within the Project footprint and will not extend to any surrounding areas

Table 6-2: Duration/Irreversibility of Impact.

Duration	Definition
Permanent or Long Term (Irreversible)	Recovery of environmental value measured in decades or irreversible
Medium Term Impact	Recovery of environmental value measured in years
Short Term Impact	Recovery of environmental value measured in days to months

Table 6-3: Impact Category.

Impact	Types
High	Irreversible Impacts at the Local or Regional Scale
	Medium Term Impact at the Regional, National or International Scale
Medium	Medium Term Impact at the Local Scale
	Short Term impact at a Regional, National or International Scale

Impact	Types
Low	Irreversible Impact at the Site Scale
	Medium Term Impact at an individual scale (i.e., a small number of animals)
	Short Term impact at a Local or Individual Scale

Table 6-4: Likelihood of Impact and Risk.

Likelihood of Residual Impact	High Impact	Medium Impact	Low Impact
Likely or Certain	High Risk	High Risk	Medium Risk
Possible	High Risk	Medium Risk	Low Risk
Not Likely	Medium Risk	Low Risk	Very Low Risk

6.2. Project Referencing

Several frames of reference are used throughout Volume 2 when describing site features, environmental values and potential impacts. For clarification these reference points are described below and shown on Figure 6-2:

- **Priority Development Area (PDA) Boundary** – The Priority Development Area was declared by the Queensland Government in 2013 and is the area subject to the development agreement between the Proponent and Government. No works associated with the Project can be carried out outside of the PDA boundary without consent from the landowner therefore the boundary is also used to delineate Project extent. The only works proposed outside of the PDA boundary is dredging associated with widening and deepening of Fison Channel. It is noted that the landside portion of the PDA contains private and public park land (such as GJ Walter Park, existing residences and a parking compound owned by SeaLink) that cannot be utilised by the Project.
- **Project Footprint** – The Project footprint refers to areas where any works associated with the Project will be carried out. This includes dredging, reclamation areas, harbour and ferry terminal upgrades, road realignment and upgrades, and building works.
- **Marine Investigation Area (MIA)** – This area is only referenced within the water quality and marine ecology sections and refers to the boundary for detailed ecological surveys of marine habitats such as seagrass, coral and benthic infauna. The investigation area was based on a conservative estimate of the area of potential impact to coastal processes and water quality from the Project.

It is noted that there is no generic reference for areas that are influenced indirectly by the Project, for example areas affected by construction noise. Indirect impacts resulting from the Project are addressed specifically for each type of impact, which are shown spatially in relation to the Project footprint where possible. The spatial extent of potential impacts may also differ depending on the matter being impacted, for example construction noise may impact on adjacent bird habitat which may then affect the capacity of certain bird species to migrate to the northern hemisphere. These indirect impacts are also addressed for each matter being impacted.

Figure 6-2 : Toondah Harbour Project Reference Area

Toondah Harbour EIS

Legend

- Toondah Harbour PDA
- Project footprint
- Marine Investigation Area

N

0 200 400 600 800 1,000 1,200 m

GDA 1994 MGA zone 56

Scale (A4):1:43,000

Layer Source: State of Queensland Datasets (© State of Queensland 2022), Aerial (© Nearmap 2020)