Port of Melbourne

Port of Melbourne Operations Pty Ltd

Dredging Program 2023-33 (DP23-33)
Environmental Management Plan

Revision history

Date	Revision	
20/07/2012	0	EMP approved by Dept. of Sustainability and Environment (DSE) (former Dept. of Environment and Primary Industries (DEPI)
20/12/2012	1	EMP approved by EGM Operations (Internal approval for commencement of maintenance dredging)
04/04/2014	2	Approved by the Minister for Environment and Climate Change delegate (Incorporation of Gellibrand Pier Dredging)
10/12/2014	3	Approved by the Minister for Environment and Climate Change delegate (Incorporation of remaining CDP obligations and approved capping protocol)
17/12/2015	4	Approved by the Minister for Environment, Climate Change and Water delegate (Refinement of approved capping protocol and updated cetacean requirements)
08/04/2016	5	Approved by the Minister for Environment, Climate Change and Water delegate (Incorporation of minor capital dredging projects in Northern Port Phillip)
27/10/2016	6	Approved by the Minister for Energy, Environment and Climate Change delegate (Port of Melbourne Lease Transaction administrative changes and incorporation of agreed capping protocol amendments approved on 29/08/2016)
1/8/2019	7	Approved by the Minister for Environment, Climate Change and Water delegate (Incorporation of requirements for capital dredging works related to DP2020 conducted in Northern Port Phillip and South Channel West)
30/11/2022	7b	DP23-33 EMP for approval by Minister for Environment, Climate Change and Water delegate for DP22-33
11/04/23	8	Final DP23-33 EMP approved by Minister for Environment delegate for DP23-33

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Abbreviations

BHGD	Backhoe and/or grab dredge
CD	Chart datum
CDP	Channel Deepening Project
dB	decibels
DAFF	Dept. of Agriculture, Fisheries and Forestry (Cth)
DMG	Dredged Material Ground
DCCEEW	Dept. of Climate Change, Energy the Environment and Water (Cwlth)
EMP	Environmental Management Plan
EMS	Environmental Management System as defined under ISO 14001
EPA	Environment Protection Authority (Victoria)
EPBC Act	*Environment Protection and Biodiversity Conservation Act 1999* (Cwlth).
HMAS	Her Majesty's Australian Ship
GIS	Geographic Information System
km	kilometre(s)
Laeq	'A' weighted equivalent noise level
m	metre(s)
MBES	Multi beam echosounder
ML	Local Magnitude (Unit of scale for measuring seismic activity)
MNES	Matters of National Environmental Significance
MPB	Microphytobenthos
NTU	Nephelometric Turbidity Units
OSF	Optimised Statistical Footprint
OCF	Operational Capping Footprint
PDS	Project Delivery Standard
PFAS	Per- and Polyfluorinated Substances
PoM	Port of Melbourne Operations Pty Ltd
PoMC	former Port of Melbourne Corporation
PoMDMG	Port of Melbourne Dredged Material Ground
SBP	Sub Bottom Profiler
SBPS	Sub Bottom Profiler Survey
SEDMG	South East Dredged Material Ground
SEES	Supplementary Environment Effects Statement
SF	Statistical Footprint
TSHD	Trailing Suction Hopper Dredge
PV	Ports Victoria
EPA Noise Protocol	*Environment Protection Act 2017* (Vic) Noise Protocol

1 Introduction

This Environmental Management Plan (EMP) details the environmental management requirements to be followed for the 10 year program of dredging activities to be undertaken by Port of Melbourne Operations Pty Ltd (PoM) between 2023 and 2033, referred to as DP23-33. The EMP has been developed based on the outcomes of the DP23-33 Risk Report.

1.1 Obligations

Under the *Delivering Victorian Infrastructure (Port of Melbourne Lease Transaction) Act 2016* (Vic), Port of Melbourne is required to dredge and maintain channels and berths and all associated dredge areas, as defined in Section 1.2 below, in accordance with the terms of the Port of Melbourne Lease Transaction.

1.2 Dredging Operations

Dredging of channels, berths, swing basins and silt traps is one of the critical asset management strategies required to be undertaken to achieve the performance and regulatory requirements to allow the safe navigation of vessels throughout all port waters.

To meet the requirements of the *Delivering Victorian Infrastructure (Port of Melbourne Lease Transaction) Act 2016* (Vic), the objectives of DP23-33 are to:

- optimise the performance of channels and berths within port waters;
- maintain the declared depths of the shipping channels, berths, approaches and associated swing basins;
- maintain the depths and capacity of all sundry areas of the port; and
- manage the placement of dredged material within the Port of Melbourne Dredged Material Ground (PoMDMG) and South East Dredged Material Ground (SEDMG).

DP23-33 includes dredging operations and dredge material management works in the following areas (see Figure 1):

- Northern Port Phillip - Yarra River and Hobsons Bay, comprising the Yarra River, Williamstown and Port Melbourne Channels, all berths, approaches, associated swing basins, silt traps and sundry port areas in the Yarra and Maribyrnong Rivers, Gellibrand Pier, Webb Dock, Station Pier and the PoMDMG; and
- South of the Bay - South Channel, SEDMG and The Entrance comprising the Great Ship Channel, Outer Western Channel, Western Channel, Eastern Channel and Outer Eastern Channel.

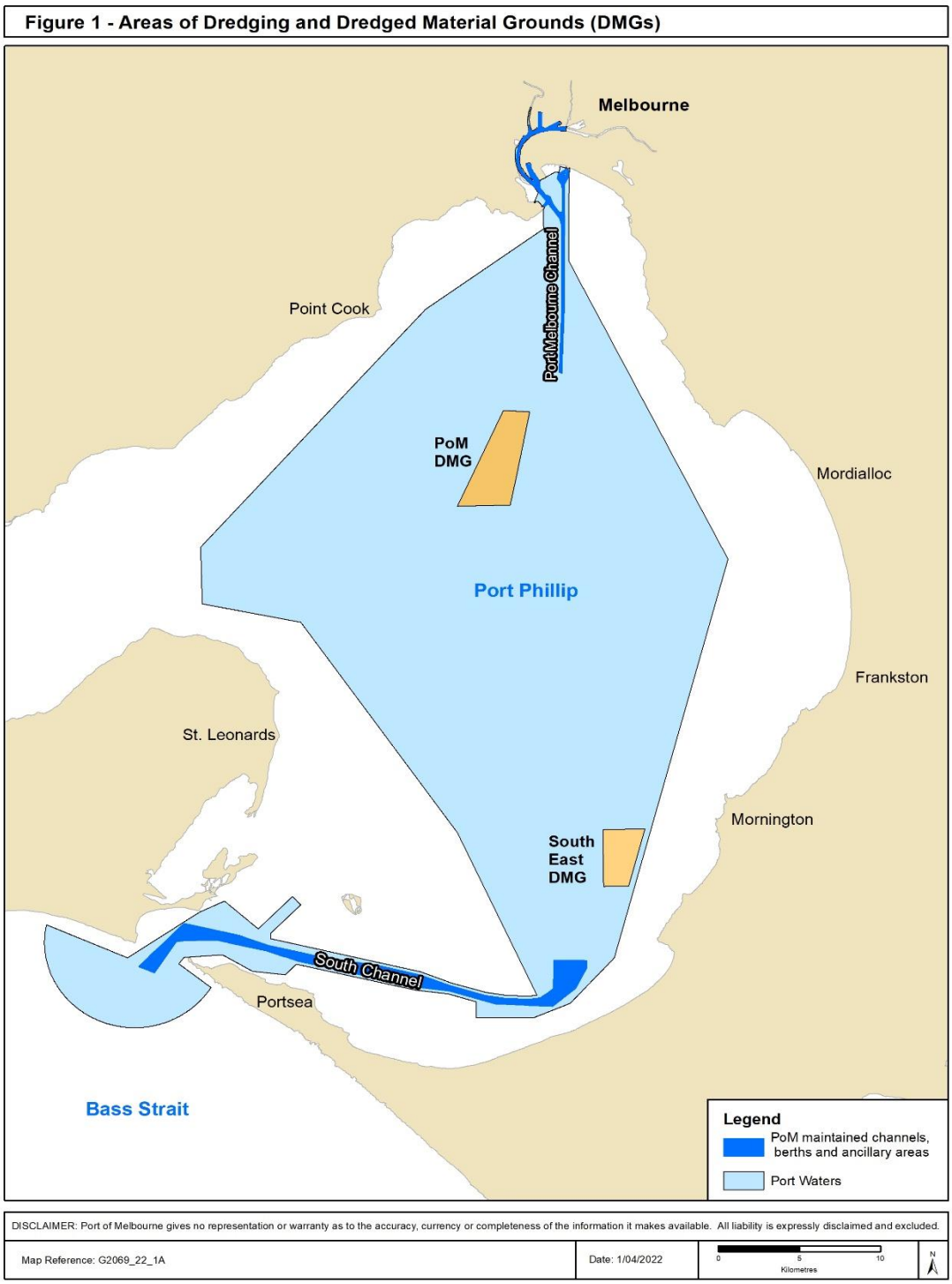


Figure 1 - Dredging locations and Dredged Material Grounds (DMG)

1.3 Scope of EMP

The scope of this EMP includes:

- the requirements for environmental management during the planning, implementation, evaluation and review of DP23-33 activities;
- the responsibilities for implementing this EMP;
- the Project Delivery Standards (PDS) including environmental controls and limits to ensure that program objectives and targets are achieved; and
- an overview of the environmental inspection and audit requirements, environmental monitoring and contingency plans and associated management actions.

This EMP applies to all dredging activities undertaken during DP23-33. PoM has overall responsibility for the implementation of DP23-33 in accordance with the requirements of this EMP. A summary of key channel and berth declared depths is provided in Table 1.

Area	Declared depth (m below CD)
Yarra River and Hobsons Bay	
▪ Yarra River Channel	14.6 to 15.5
▪ Williamstown Channel	15.5
▪ Yarra and Maribyrnong River berths, approaches and associated swing basins	10 to 15.5
▪ Gellibrand Pier	15.5
▪ Webb Dock	7 to 14.6
▪ Station Pier	8.0 to 10.9
▪ Ann Street Pier and approaches	6 to 7
North of the Bay – Port Melbourne Channel	10.9 to 15.5
South of the Bay – South Channel	15.5 to 16.5
The Entrance:	Declared depth (m below CD)
▪ Great Ship Channel	17.0
▪ Outer Western Channel	10.3
▪ Western Channel	11.4
▪ Eastern Channel	11.9
▪ Outer Eastern Channel	10.0

Table 1 - Summary of key channel and berth declared depths (m)

It is estimated that approximately 1.27 million m^3 of material is to be dredged over the next 10 years of maintenance dredging activities. This estimated volume is consistent with the Channel Deepening Project (CDP) Supplementary Environment Effects Statement (SEES) which estimated that ongoing dredging to maintain the declared depths for shipping over a 10 year period would comprise approximately 3.7 million m^3.

The sediments to be dredged are shown in Table 2; the as-dredged volumes will vary depending on survey results, rates of sedimentation and the availability of dredging equipment. Dredging activities may occur concurrently in these project areas.

The dredging works will be undertaken by backhoe and/or grab dredges (BHGD), Trailing Suction Hopper Dredges (TSHD) and various support equipment including tugs, barges and sweeping / water injection vessels.

All sediments dredged from northern Port Phillip are deemed to be contaminated unless demonstrated otherwise. Material deemed to be contaminated will be placed within an underwater containment area at the PoMDMG located in the North of the Bay (see Figure 1).

If sediments are determined to be uncontaminated and suitable for unconfined disposal they will be placed within the PoMDMG or, subject to geotechnical parameters, utilised for ongoing bund construction and/or maintenance.

Materials dredged from the South of the Bay will be placed in the SEDMG. (see Figure 1). If it is necessary to remove any loose material from the Entrance, it will be placed in the SEDMG.

Area	**Volume (m^3)**	**Sediment Type**	**Disposal Location**
Northern Port Phillip	0.74M	Clays and Silts (contaminated)	PoM DMG
Southern Port Phillip including the Entrance	0.53M	sands and other materials (clean)	SEDMG
Estimated Total	**1.27M**		

Table 2 - Summary of materials to be dredged

1.4 Timing Considerations

As a result of the consideration of key environmental and social seasonality issues, preference will be given to:

- maximising dredging works in summer, autumn and winter in northern Port Phillip.
- maximising dredging works in autumn, winter and spring in southern Port Phillip.

1.5 Key assets, environmental effects and risks

1.5.1 Key Ecological Assets

The key assets, predicted effects and risk events associated with ongoing maintenance dredging (and minor capital dredging) activities are summarised below. Detailed information is contained within the risk assessment (refer to Section 2.4)

The key ecological assets and potential impacts include:

- listed and protected species – potential disruption of migration patterns for the Australian grayling due to turbidity, and potential impacts to protected species due to turbidity and impacts on seagrass habitat;
- seagrass habitat – reduced light due to turbidity has the potential to affect seagrass health;
- Marine Protected Areas – potential impacts from turbidity in the vicinity of the Port Phillip Heads Marine National Park; and
- Ramsar sites (Swan Bay, Mud Island and the Spit Wildlife Reserve) – potential impact due to hydrodynamic changes and turbidity.

1.5.2 Key Social Values and Economic Uses

The key social values, economic uses and potential impacts include:

- public amenity – noise and visual impacts of the project;
- recreational activities (diving, fishing, boating and beach use) – impacts due to dredging works;
- commercial uses (eg commercial diving and fishing activities, charter fishing, ecotourism) – potential disruption due to turbidity, and safety zones and no-dive zones around dredging equipment; and
- cultural heritage – potential disturbance to the shipwreck sites *HMAS Goorangai.*

1.6 Environmental policy

PoM's Environmental Policy provides the umbrella policy direction for the DP23-33.

This Environmental Policy is displayed in the PoM workplace. Key requirements and responsibilities will be communicated via inductions or other training programs (refer to Training and awareness Section 2.8).

PoM is committed to delivering DP23-33 in an environmentally responsible manner and in accordance with its statutory approvals and this EMP.

1.7 Environmental Management Plan overview

The implementation of this EMP is underpinned by the systems and procedures of PoM's Integrated Management System (IMS) as discussed further below.

PoM's port-wide 'Safety and Environment Management Plan' (SEMP), which is required under the *Port Management Act 1995* (Vic) (PMA), is applicable for the subject area with the Port's environmental management requirements outlined within this guiding document.

In accordance with the PMA, PoM's SEMP was externally audited in May 2022 by an auditor approved by the Minister for Ports and Freight and found to be fully compliant with the PMA SEMP obligations.

The SEMP promotes:

- a cooperative approach to safety and environmental management between PoM and Port stakeholders, including but not limited to Ports Victoria, Port tenants, licencees, users and service providers; and
- delivery of best practice safety and environmental management within the Port.

Complementing the Board-approved Environment Policy and the SEMP, PoM has the following supporting plans and systems to ensure PoM is managing the port in accordance with its contractual responsibilities under the Port Concession Deed and Port Lease in an environmentally sustainable manner:

- a Port Environment Strategy which is required to be maintained and an annual report provided as part of the Port Lease;
- certification from Bureau Veritas of PoM's IMS to ISO 14001:2015 Environmental management systems, ISO 45001:2018 OH&S management systems, ISO 9001:2015 Quality Management Systems and ISO 55001:2014 Asset Management; and
- this DP23-33 Environmental Management Plan (EMP).

This EMP has been prepared to fulfil the following objectives:

- to establish the processes and controls that will be implemented to ensure that DP23-33 is delivered with all risks or effects equal to or less than those identified in the risk assessment;
- to communicate environmental management requirements to the dredging contractor, which will also be required to meet the requirements of this EMP; and
- to ensure that the project does not result in unacceptable environmental impacts upon the assets, values and beneficial uses of Port Phillip including matters of national environmental significance.

1.8 EMP approval and revisions

This EMP is a controlled document and will be approved and revised in accordance with the requirements outlined in Table 3.

PoM will consult relevant agencies on any proposed revisions to the EMP that concern conditions of approval.

Where agency approval is required, this will be sought prior to implementing the change. Where approval is not required, relevant agencies will be notified of the change and issued with a revised EMP within 14 days, in accordance with requirements outlined in Table 3.

	Approval	
	Port of Melbourne	Victorian Government
Initial version	Approved by Executive General Manager, Operations.	Approved by the Minister for Environment or delegate.
Procedural revision (administrative changes e.g. amendment of procedure reference, formatting)	Approved by Executive General Manager, Operations	Notification of change to the Secretary to DEECA or delegate.
Minor revision (changes within existing environmental approvals)	Approved by Executive General Manager, Operations	Notification of change to Secretary to DEECA or delegate.
Major revision (changes requiring amendment to environmental approvals)	Approved by Executive General Manager, Operations.	Approved as required by the Minister for Environment, or delegate.

Table 3 - EMP approval and revision requirements

2 Planning

2.1 Legal requirements

Project approvals, legal requirements and other relevant requirements such as guidelines and codes of practice have been identified.

Where legislation requires a specific management action or response, these requirements have been identified within the PDS as environmental controls, environmental limits, environmental monitoring programs, or within contingency plans. The content of a PDS is further described in Annexure 2. The PDS associated with key legislation are identified in Table 4.

Compliance with legal and other relevant requirements will be evaluated in accordance with the PoM's *Compass*.

Legislation	Applicable Project Delivery Standards
Marine and Coastal Act 2018 (Vic) *Environment Protection Act 2017* (Vic) *Climate Change Act 2017* (Vic) *Marine Safety Act 2010* (Vic) *Aboriginal Heritage Act 2006* (Vic)	All PDSs
Environment Protection and Biodiversity Conservation Act 1999 (Cwlth)	Marine-based works (all areas) Dredging and plume Dredging schedule Dredged material management
Historic Shipwrecks Act 1976 (Cwlth) *Heritage Act 1995* (Vic)	Marine-based works (all areas)
National Parks Act 1975 (Vic) *Wildlife Act 1975* (Vic) *Flora and Fauna Guarantee Act 1988* (Vic)	Marine-based works (all areas) Dredging and plume Entrance maintenance

Table 4 - Key legislation and associated Project Delivery Standards

2.2 Project Delivery Standards

Project Delivery Standards (PDS) have been identified to address key environmental risks, effects and legal requirements. The PDS are a collation of the management and mitigation measures, environmental monitoring and contingency plans for the project.

The DP23-33 activity-based PDS groups are:

- maintenance management (all activities);
- marine-based works (all areas);
- dredging and plume;
- dredging schedule;
- dredged material management; and
- Entrance maintenance.

The PDS relevant to the activities of DP23-33 are contained in Annexure 1 of this EMP.

The content of a PDS group includes the following:

- an objective – the performance goal;
- a target – performance level at which the objective is demonstrated as being achieved;
- application – the project activities and project areas to which the PDS applies;
- environmental controls – management and mitigation measures required to support achievement of the objective during the implementation of the project. These include process controls and associated monitoring;
- environmental limits –numerical performance standards which the project must comply with;
- reference to environmental monitoring programs where applicable to the PDS; and
- reference to contingencies – any relevant contingency plan containing management actions which may be taken in the event of potential exceedance of the environmental limit or response level.

2.3 External notification and reporting requirements

Performance against this EMP will be reported to government agencies as described in Table 5.

Subject	Reporting or notification	
	Government agency	Timeframe
Environmental limit exceeded	Airborne noise – EPA, DEECA	Notification within 24 hours of verifying that environmental limit has been exceeded. Incident report required.
Pollution event or imminent environmental hazard (as defined in EPA Publication 953.2, 2007)	DEECA, EPA, DCCEEW*	Immediate notification. Incident report required.
Marine and Aboriginal heritage	Heritage Victoria, DEECA	Notification within 10 business days of discovery of shipwreck or potential Aboriginal site is identified. Notification prior to any additional surveys being conducted. Report to be forwarded following heritage inspections.
Campaign dredging schedule	DEECA	The schedule for each campaign will be forwarded by management no less than 10 business days prior to campaign commencement.
Pre-mobilisation Review and Campaign Initiation Report	DEECA	Report to be forwarded no less than 10 business days prior to campaign commencement.
Campaign close-out report	DEECA, DCCEEW*	Close-out report to be forwarded within 90 business days of the completion of each campaign.
Independent environmental audit of implementation of this EMP	DEECA, DCCEEW*	Audit report will be provided with the campaign close-out report, within 90 business days of the completion of campaign.
Project Delivery Standard	DEECA, DCCEEW*	Notification within 1 business day of verifying major non-conformance with a Project Delivery Standard (or part thereof)

*only for components relating to EPBC Act matters of national environmental significance

Table 5 - Notification and reporting requirements

2.4 Risk management

Environmental risks associated with DP23-33 have been identified and documented in a risk register consistent with international Risk Management Standard ISO31000:2009 (International Organisation for Standardisation).

Adverse predicted effects and risk events are identified in the DP23-33 Risk Report. The risk report contains 'event trees' that show the linkages between initiating events and their subsequent chains of impacts and consequences. Risks are then assessed in terms of likelihood and consequence.

The risk register will be reviewed periodically to incorporate monitoring and investigation results and to reflect changes identified through the change management process, or as a result of incident investigations. Changes to the risk register will be approved by PoM's Executive General Manager, Operations and be included for review in the Pre-Mobilisation Review and Campaign Initiation Report (see Section 4.1).

Risk management, including review and reporting requirements, are outlined in the PoM DP23-33 Risk Report.

Task-based risk assessments (e.g. Job Safety and Environment Assessments) will be undertaken during the project to identify and control work place hazards.

2.5 Organisational structure and responsibility

PoM has overall responsibility for the implementation of DP23-33 in accordance with the requirements of this EMP and is responsible for communicating responsibilities to the dredging contractor.

The Executive General Manager, Operations, reports to the Chief Executive Officer who, in turn, reports to the Board. The Executive General Manager, Operations, is accountable for:

- implementing this EMP;
- coordinating all activities relating to this EMP; and
- providing adequate resources to undertake DP23-33 in accordance with this EMP.

Responsibility for implementing this EMP will be delegated by the Executive General Manager, Operations, through the management team to the workforce, the dredging contractor and relevant external parties.

All levels within the management structure have duties and responsibilities associated with implementing this EMP. The specific responsibilities for implementing this EMP will be identified in internal operational procedures.

2.6 Document and record control

Environment documents and records will be managed in accordance with PoM's Records Management Policy and associated documents.

2.7 Continuous Improvement

PoM is committed to continuous improvement during DP23-33. Management reviews will identify suitable opportunities for continuous improvement (see Section 4.2).

Proposed changes to the program will be assessed and documented following the Dredging Change Management Procedure in order to identify and manage any consequences of the change. This will include an assessment of the risk and compliance with legal requirements.

Changes may include:

- alteration of dredging schedule;
- modification of work methods within approved scope;
- adjustment of environmental monitoring response levels;
- change to project description; and
- future changes or improvements to dredging technology.

Changes will be approved by the Executive General Manager, Operations or delegate, with any necessary changes to this EMP handled in accordance with Table 3.

As an example of continuous improvement, based on 2 years of technical studies commissioned by PoM at the PoMDMG undertaken between 2020 and 2021, PoM will undertake a new monitoring and management regime (including management intervention trigger levels and measures) based on the DP23-33 Risk Report (refer to Section 3.6).

2.8 Training and awareness

All personnel shall be suitably qualified and experienced to undertake their work in an environmentally responsible manner. Personnel who have formal responsibilities under this plan will be trained in the requirements of this EMP.

Training may include formal courses, tool box meetings and in-field mentoring. Records of training and inductions will be maintained.

Training requirements will include relevant personnel to be trained in spotting and identification of cetaceans (whales, dolphins).

All personnel involved in DP23-33 will be required to complete an induction which will incorporate key environmental aspects of the project. All personnel will be required to complete an assessment to demonstrate an understanding of key issues, requirements and responsibilities.

Induction topics will include the following:

- Environment Policy;
- key environmental issues and controls;
- monitoring program(s);
- emergency response;
- incident reporting;
- waste management;
- cetacean requirements;
- responsibilities;
- communication requirements; and
- consequences of a departure from the requirements of this EMP.

2.9 Communication

Internal and external communication and consultation arrangements are described below. The communications specialist or delegate will be responsible for and undertake all requirements with respect to community liaison.

2.9.1 Internal communication

Internal communication methods include meetings, emails, newsletters and notices, and environment notice boards.

Regular meetings between PoM personnel and contractors will be scheduled. Environmental matters will be included as a standard agenda item at these meetings.

2.9.2 External communication

A variety of methods will be used to enable information to be distributed to, and be received from, interested members of the community and key stakeholders. These may include the following:

- website (refer www.portofmelbourne.com);
- email;
- media releases;
- newspaper advertisements;
- direct verbal or written advice (e.g. telephone, letter, email); and
- Notices to Mariners and shipping protocols.

The provision of information to bay users of non-English speaking origin will be consistent with current Port of Melbourne protocols for the translation and distribution of communications in languages other than English.

Key communication activities and content include the following:

- the campaign dredging schedule to be available on the website covering project activities occurring in an upcoming campaign. Schedule to the updated as required;
- all complainants will receive a response within 1 business day. Complaints will be managed following the process described in Annexure 5 and resolved as soon as practicable; and
- engage various stakeholder groups just prior to and following commencement of each maintenance campaign.

Key stakeholders include local, state and Commonwealth government bodies, business and commercial parties, industry representatives, bayside community and indigenous and heritage groups.

2.10 Emergency preparedness, response and recovery

Emergency scenarios are identified in the risk report. In accordance with legislative requirements, PoM has a comprehensive Emergency Management Plan for emergencies that occur in its jurisdictional land and waters.

The contractor will have an emergency response procedure. This procedure will be in accordance with operational requirements, Harbour Master's directions and emergency management provisions contained in the Ports Victoria Port Operations Handbook and Harbour Master's Directions. The procedure will be reviewed to ensure consistency with PoM's Emergency Management Plan.

Inductions will provide an overview of emergency response requirements. Site specific inductions and training will be undertaken by the dredging contractor.

Following an emergency incident, an investigation will be conducted and corrective actions identified and addressed in accordance with PoM's Emergency Management Plan.

3 Measurement and evaluation

3.1 Incident reporting and investigation

Environmental incidents and hazards, including pollution incidents will be reported and recorded consistent with PoM's incident reporting requirements. This requirement will be included in inductions and reinforced during the project.

External reporting requirements in relation to hazards and incidents are identified in Table 6.

3.2 Audits

A suitably qualified external auditor will be appointed to independently assess the conformance of each dredging campaign with the requirements of this EMP. The auditor may be appointed to audit a number of campaigns.

A program will be developed for the independent environmental audit, taking account of:

- the timing of the proposed works;
- the nature of the proposed works;
- the environmental risks of the dredging and dredged material management activities;
- the location, timing and volume of dredge material to be removed for minor capital projects; and
- the relevant PDS (see Annexure 2).

The audit will evaluate performance on the basis of environmental management records. The audit activities may also include direct observation of activities, as relevant.

The audit report will include:

- summary of findings;
- audit objective;
- audit scope;
- audit activities;
- audit reference documents;
- audit findings classification (as summarised in Table 6); and
- audit findings and conclusion.

The audit findings will inform the management review of this EMP (see Section 4). The audit report will be provided, with the campaign close-out report, to relevant government agencies (see Section 4).

Finding level	Description
Conformance	There is sufficient evidence to confirm that actions have been undertaken, prepared and/or implemented in full conformance with the requirements of the auditable element.
Major non-conformance	The evidence shows that actions are not in full conformance with the requirements of the auditable element and this gives rise to the potential that the environment will be significantly affected (as defined in the risk assessment process) if the non-conformance is not rectified.
Minor non-conformance	The evidence shows that actions are not in full conformance with the requirements of the auditable element but it is unlikely that this will cause the environment to be significantly affected (as defined in the risk assessment process).
Not applicable	The auditable element falls outside the scope of the audit, e.g. work relevant to the element being audited has not yet commenced.
Area for improvement	A deficiency in the implementation of this EMP judged to be a risk to the environment, or to environmental management, without constituting an overall failure in the area concerned.
Undetermined	There is insufficient evidence to make a judgement on compliance.

Table 6 - Summary of audit findings classifications

3.3 Monitoring of environmental performance

Environmental performance will be monitored via three mechanisms:

- process monitoring, inspections and surveys – monitoring of operational activities, physical conditions and post-maintenance activity environmental conditions (e.g. equipment tracking, monitoring of DMG integrity, bathymetric surveys, Entrance surveys). Process monitoring, inspections and surveys are identified in PDS alongside process controls
- management performance monitoring – monitoring of the implementation and effectiveness of the environmental management system (e.g. nature of complaints, number of corrective actions completed). Monitoring data informs the overall management of the project. It does not directly inform operational aspects, but may indirectly through the management review process
- environmental monitoring and contingency plans – monitoring or response levels or environmental limits, with a description of the process to be followed in the event that identified levels or limits are reached.

3.4 Process monitoring

Process monitoring identified in the PDS includes the following:

- equipment tracking – Dredging and plume PDS and Dredged material management PDS;
- hydrographic surveys – Dredged material management PDS;
- monitoring of energy consumption and greenhouse emissions – maintenance management (all activities) PDS; and
- monitoring removal of contaminated sediments – Dredging and plume PDS.

3.5 Inspections and surveys

Inspections and surveys are identified in the PDS. These include:

- multibeam surveys and inspections at HMAS Goorangai as identified in the marine-based works (all areas) PDS;
- vessel inspections for marine pests as identified in marine-based works (all areas) PDS;
- Entrance inspections and surveys as identified in the Entrance PDS; and
- bathymetric and multibeam surveys as identified in dredging and plume PDS.

3.6 DP23-33 Monitoring and Management Framework (including management intervention measures)

Based on the outcomes of the DP23-33 Risk Report, the following monitoring and management framework will be undertaken at the PoMDMG:

Dredging Schedule	**Monitoring and Management Framework**
First Dredging Campaign:	Dredge material: Dredge hopper/barge sampling (TSHD/Backhoe) and sediment testing, including density (bulk, dry and particle) and shear strength, to determine sediment properties.
	1 month after dredging completed: Sample 5 sediment cores from placed material at either the northern uncapped site or an area outside of the DMG for a control site. Square arrangement with one sample in the middle. Results can be averaged or looked at individually. Test top 20mm, then at 0.25m and 0.5m core depth for baseline density and shear strength.
Years 1-2 After Placement:	6-month intervals - Collect core samples of 0.5 m depth and test for density and shear strength.
Following Years:	To be determined and actioned following the results of Years 1-2 monitoring.

Dredging Schedule	Monitoring and Management Framework
Other Monitoring Requirements (after completion of dredging in 2023)	Additional monitoring requirements approved by DEECA consistent with DEECA's 'Seafloor Integrity Project' (refer DP23-33 Risk Report).
	Bioaccumulation study to be approved by DEECA.
Bioturbation	Annual density survey by a qualified marine biologist. If significant bioturbation is present, bioaccumulation testing at representative site within the DMG and a reference site outside the DMG.
Survey	Annual MBES survey as per the current hydrographic monitoring requirements to determine any required management actions.

Depending on the results of the monitoring program, the following management trigger points and management actions are proposed:

Item	Trigger	Management Action
Consolidation	10-year ARI wind speed persisting for 3 hours and annual MBES survey shows sediment erosion on the seabed	Capping of affected sediment within clean sand within 12-18 months
Bioturbation	Established link between bioturbation (burrowing density) and bioaccumulation of toxicants	Capping of affected sediment within clean sand within 12-18 months

3.7 Other environmental monitoring and contingency plans

In addition to the monitoring and contingency plans described in Section 3.6 above, environmental monitoring and contingency plans monitor response levels or environmental limits, with a description of the process to be followed in the event that identified levels or limits are reached.

The management actions identified in the contingency plans are not an exhaustive list but tangible responses that the project will implement if required. The most appropriate management action will be selected on a case by case basis (refer to Annexure 3).

4 Management Review and Reporting

4.1 Pre-Mobilisation Review and Campaign Initiation Report

A dredging campaign comprises all dredging and dredging-related activities required in a particular timeframe following collection and assessment of hydrographic data that is routinely collected in the port.

Prior to commencement of the each dredging campaign, a Pre-Mobilisation Review and Campaign Initiation Report (Report) will be prepared by management to inform each maintenance campaign.

The Report will document the assessment by management of:

- the project activities to be undertaken for the campaign including any new dredging equipment, spoil management requirements and associated methodologies;
- estimated volumes to be dredged;
- hydrographic survey requirements;
- assessment of legal requirements including statutory approvals and other commitments, including listing of new species, habitats, communities and locations under Victorian or Commonwealth review;
- review of significant events that may have occurred since the previous campaign;
- review of environmental monitoring results from previous campaign(s);
- review of the relevant risks associated with all dredging activities;
- requirements of audits; and
- a summary of consultation activities.

The report will be sent to DEECA ten (10) business days prior to commencement of a campaign.

4.2 Campaign Close-Out Report

At the end of the each campaign, a Campaign Close-Out Report will be prepared by senior management. The information from this review process will be used to inform subsequent maintenance campaigns.

The review will consider:

- summary of dredging activities undertaken;
- compliance with PDS;
- compliance with legal requirements including statutory approvals and other commitments;
- environmental performance monitoring results;
- results of inspections and surveys;
- results of audits, including the independent environmental audit;
- project risk profile; and
- lessons learned including any amendments required to the PDS.

Where an opportunity for continual improvement has been identified as part of the management review process, the following actions may be considered for each following maintenance campaign:

- development of new procedures;
- modification of existing procedures;
- modification to project scheduling;
- modification to communications strategy;
- modification to training schedule and/or programs;
- modifications to internal audit schedule;
- assessment as to whether any input is required from external specialists; and
- consideration of need for further investigations.

Any action arising from the management review will be assigned responsibility and tracked until completion.

The campaign close-out report will be sent with the independent audit to relevant government agencies within 90 business days of completion of each campaign (refer to Table 5).

Annexure 1 Project Delivery Standards – applicable works and project areas

Project Delivery Standards – applicable works and project areas (guide only)

Project Delivery Standards	Yarra River and Hobsons Bay	North of the Bay	South of the Bay	The Entrance	PoMDMG
Maintenance management (all activities)					
1. Hours of operation	✓	✓	✓	✓	✓
2. Airborne noise	✓	✓	✓	✓	✓
3. Airborne Noise Monitoring	✓	×	✓	✓	×
4. Waste management	✓	✓	✓	✓	✓
5. Energy and greenhouse gases	✓	✓	✓	✓	✓
6. Equipment maintenance	✓	✓	✓	✓	✓
7. Fuels, oils, chemicals and hazardous goods	✓	✓	✓	✓	✓
8. Emergency response preparedness	✓	✓	✓	✓	✓
Marine-based works (all areas)					
9. Marine pests	✓	✓	✓	✓	✓
10. Vessel bunkering	✓	✓	✓	✓	✓
11. Cetaceans – vessel manoeuvring	✓	✓	✓	✓	✓
12. Cetacean sightings and log	✓	✓	✓	✓	✓
13. Dredging in the vicinity of services	✓	✓	×	×	×
14. Heritage (marine-based) – identification of potential relics	✓	✓	✓	✓	×
15. Maritime heritage – dredging	×	×	✓	×	×
Dredging and plume					
16. Dredging	✓	✓	✓	✓	×
17. Dredging of consolidated and unconsolidated contaminated sediments	✓	✓	×	×	×
18. Dredging of consolidated uncontaminated sediments.	✓	✓	✓	✓	×
19. Dredging of unconsolidated uncontaminated sediments	✓	✓	✓	✓	×
Entrance Activities					
20. Dredging in The Entrance	×	×	×	✓	×
Dredging schedule					
21. Campaign dredging schedule	✓	✓	✓	✓	✓
22. Consideration of seasonal sensitivities	✓	×	✓	×	×
Dredged material management					
23. Dredge material placement	✓	✓	✓	✓	×
24. DP23-33 Monitoring and Management Framework	×	×	×	×	✓
25. PoMDMG – final capping	✓	✓	✓	×	✓
26. PoMDMG – maintenance and inspection.	×	×	×	×	✓
27. SEDMG	×	×	✓	✓	×

Annexure 2 Project Delivery Standards

Dredging management (all activities)		
Objective	To appropriately plan and implement operational aspects of dredging activities. To ensure noise levels comply with EPA Noise Protocol requirements. To ensure that materials are appropriately stored, handled and disposed of.	
Target	Conformance with environmental limits and controls specified in this PDS.	
Application	The duration of dredging activities and areas.	
Environmental controls		**Project phase**
1. **Hours of operation** ▪ All activities may be conducted on a 24 hour, 7 days a week basis, except where explicitly restricted within a PDS, or relevant legislation.		All phases
2. **Airborne noise** ▪ All activities to be conducted within EPA Noise Protocol limits. ▪ A desktop noise assessment of dredging vessels and major equipment (that are new to works in port waters and not included in the existing modelling) to be conducted before acceptance and mobilisation onto program. ▪ Where the assessment indicates that the vessel or equipment may not conform to the risk assessment outputs, appropriate action is to be taken as described in Airborne Noise Contingency Plan.		All phases
3. **Airborne Noise Monitoring** ▪ Noise monitoring to be undertaken as described in the Airborne Noise Contingency Plan (Annexure 3). ▪ Where monitoring indicates an exceedance, or potential exceedance, of EPA Noise Protocol limits, appropriate action is to be taken as described in Airborne Noise Contingency Plan (Annexure 3).		Activity
4. **Waste management** ▪ All marine vessels to have sewage containment or treatment facilities. Sewage treatment will comply with Section 23G of the *Pollution of Waters by Noxious Substances Act 1986* (Vic). ▪ Contractor waste management arrangements to include waste minimisation, containment, segregation and appropriate reuse, recycling, treatment and disposal. ▪ The handling and disposal of unexpected materials identified during TSHD dredging (e.g. inert debris such as metallic wastes and timber) to be included in waste management arrangements. ▪ All waste to be managed in accordance with: – *Environment Protection Act 2017* (Vic) – *Quarantine Act 1908* (Cth) (applicable vessels) – *Pollution of Waters by Oil and Noxious Substances Act 1986* (Vic)		Activity
5. **Energy and greenhouse gases** ▪ The project will identify, calculate and report on energy consumption and greenhouse emissions on major plant and equipment if required under the *National Greenhouse and Energy Reporting Act 2007* (NGER)		Activity

Dredging management (all activities)	
and/or any other requirements under the *Climate Change Act 2017* (Vic).	
6. **Equipment maintenance** ▪ Maintenance programs will be implemented for all plant and equipment as defined in the *Occupational Health and Safety Regulations 2007* (Vic).	Activity
7. **Fuels, oils, chemicals and hazardous goods** ▪ Storage and handling of chemicals in accordance with: – *Dangerous Goods Act 1985* (Vic) – *International Ship Management (ISM) Code* (applicable vessels) – *Pollution of Waters by Oil and Noxious Substances Act 1986* (Vic)	Activity
8. **Emergency response preparedness** ▪ Development and testing of emergency response procedures, integrated with PoM's Emergency Management Plan, including provision for fuel, oil and chemical spills. ▪ All dredge vessels to have oil spill response kits on board. Relevant personnel to be trained in its use.	Activity

Environmental limit	**Environmental monitoring program**
Airborne noise	Airborne Noise Contingency Plan

Contingencies	Airborne Noise Contingency Plan Emergency response managed via Emergency Response Procedures (EMP Section 2.10)

Table 7 - Dredging management (all activities) PDS

Marine-based works (all areas)		
Objective	To appropriately manage marine-based works. To minimise disturbance to and appropriately manage non-Aboriginal heritage. To minimise impacts on cetaceans due to vessel manoeuvring.	
Target	Conformance with environmental controls specified in this PDS.	
Application	All marine-based dredging activities.	
Environmental controls		**Project phase**
9. **Marine pests** ▪ Marine pest inspection and certification of monitoring and support vessels, dredgers and pontoons is required before mobilisation onto project, where these are sourced from outside Port Phillip. Certification must be received from the final port of call, before entry to Port Phillip. ▪ All applicable vessels to comply with the 'Australian Ballast Water Management Requirements', Dept. of Agriculture, Fisheries and Forestry (DAFF) (Cwlth.)		Pre-mobilisation Activity
10. **Vessel bunkering** ▪ All bunkering to take place in accordance with Ports Victoria Bunkering Guidelines and vessel bunkering procedures.		All phases
11. **Cetaceans – vessel manoeuvring** If within 300 m of a whale or dolphin the vessel must not: ▪ approach a whale or dolphin head on; ▪ restrict the path of a whale or dolphin; ▪ pursue a whale or dolphin; ▪ separate any whale or dolphin from a group; ▪ come between a mother and a calf; and ▪ drop or lower an anchor overboard from the vessel. If within 300 m of a whale or dolphin, the vessel must: ▪ maintain a constant speed that does not exceed 5 knots; ▪ avoid sudden changes in speed and direction; ▪ post a lookout for cetaceans; and ▪ manoeuvre the vessel to a distance of at least 300 m from the whale or dolphin if it shows any signs of disturbance.		All phases
12. **Cetacean sightings and log** ▪ Personnel on board vessels are to report all sightings of cetaceans; and ▪ A log of cetacean sightings and action taken to be kept for all work areas.		Activity
13. **Dredging in the vicinity of services** ▪ Management measures including positional controls and mechanical devices or annexures to dredging equipment to minimise the risk of damage to services.		Activity
14. **Heritage (marine-based) – identification of potential relics** ▪ If potential relics are identified during maintenance activities, the process described in Annexure 4 will be followed.		Activity
15. **Maritime heritage – dredging**		Pre-activity

<table>
<tr><th colspan="3">Marine-based works (all areas)</th></tr>
<tr><td colspan="2">

Conduct multibeam survey in the vicinity of the HMAS Goorangai (S294) before and after dredging in the area identified in Activity Areas – Heritage Significance drawings included in Annexure 5.
The following management measures shall be implemented for the wreck of the HMAS Goorangai (S294) for works identified in drawings included in Annexure 5 – Activity Areas – Heritage Significance:

obtain an appropriate permit from Heritage Victoria;
use of the sweep bar in conjunction with the TSHD in the vicinity of the HMAS Goorangai;
draghead tracking to confirm that dredging has not occurred within the area of heritage significance; and
conduct site inspection within 2 months of completion of dredging in the vicinity of HMAS Goorangai (S294).

Inspections to be carried out under the supervision of an archaeologist and reports to be provided to Heritage Victoria, if needed.

</td><td></td></tr>
<tr><td colspan="2">Environmental limit</td><td>Environmental monitoring program</td></tr>
<tr><td colspan="2">Not applicable to this PDS</td><td>Not applicable to this PDS</td></tr>
<tr><td>Contingencies</td><td colspan="2">Not applicable to this PDS</td></tr>
</table>

Table 8 - Marine-based works (all areas) PDS

<table>
<tr><th colspan="3">Dredging and plume</th></tr>
<tr><td>Objective</td><td colspan="2">To optimise the performance of channels and berths
To appropriately manage dredging activities and contaminated sediments.
To minimise the area of seabed disturbed and appropriately manage the material removed.
To protect assets, beneficial uses and values from long-term adverse effects due to dredging-related water quality effects.</td></tr>
<tr><td>Target</td><td colspan="2">Maintain physical dredging works within the nominated activity zones
No turbidity plume extent outside expectations</td></tr>
<tr><td>Application</td><td colspan="2">▪ All maintenance dredging activities in the Yarra and Maribyrnong Rivers, Williamstown Channel, Hobsons Bay, Port Melbourne Channel, South Channel and Entrance;
▪ All minor capital dredging projects undertaken in the Yarra and Maribyrnong Rivers, Williamstown Channel, Hobsons Bay and Port Melbourne Channel; defined as comprising a maximum insitu dredge volume of 50,000 m^3/annum
▪ The disposal of dredged material at the PoMDMG and SEDMG; and
▪ Use of TSHD, BHGD, sweep and associated equipment.</td></tr>
<tr><td colspan="2">Environmental controls</td><td>Project phase</td></tr>
<tr><td colspan="2">16. Dredging
▪ Multibeam surveys of all channels to be undertaken prior to commencement of dredging.
▪ Due to dredging tolerance, actual depth will exceed the declared depths. The declared depths to be maintained are as follows:
<table>
<tr><th>Area</th><th>Declared depth (m below CD)</th></tr>
<tr><td>Yarra River and Hobsons Bay
• Yarra River Channel
• Williamstown Channel
• Yarra and Maribyrnong River berths, approaches and associated swing basins
• Gellibrand Pier
• Webb Dock
• Station Pier
• Ann Street Pier and approaches</td><td>
14.6 to 15.5
15.5
10 to 15.5
15.5
7 to 14.6
8.0 to 10.9
6 to 7</td></tr>
<tr><td>North of the Bay – Port Melbourne Channel</td><td>10.9 to 15.5</td></tr>
<tr><td>South of the Bay – South Channel</td><td>15.5 to 16.0</td></tr>
<tr><td>The Entrance:
• Great Ship Channel
• Outer Western Channel
• Western Channel
• Eastern Channel
• Outer Eastern Channel</td><td>
17.0
10.3
11.4
11.9
10</td></tr>
</table>
▪ Dredging Activity Zone – activity zones have been identified to limit the footprint of dredging activities. The areas are identified in Annexure 6.
▪ All dredging activities to take place within the activity zones. No dredging (as a subset of dredging activities) is to take place within 65 m of the outside edge of the</td><td>Pre-Activity and post-Activity
Activity</td></tr>
</table>

Dredging and plume

activity zone (Port Melbourne Channel, South Channel and the Entrance only, except to the extent necessary to achieve the declared depth.

- Dredging campaigns not to exceed a maximum duration of:

Area	Maximum duration	Principal proposed dredging operation
Yarra River, Maribyrnong River and Hobsons Bay	16 weeks	Dredging by BHGD in channels and at berths, approaches and swing basins.
	6 weeks	Dredging by TSHD in channels, approaches and swing basins and disposal in PoMDMG.
North of the Bay	1 week	Dredging by TSHD in Port Melbourne Channel south of Williamstown Channel
South of the Bay	6 weeks	Dredging by TSHD in South Channel
The Entrance	1 week	Dredging by TSHD in channel

- Dredging equipment and associated support vessels will be required to manoeuvre outside activity zones, including transit between activity zones.
- Toe lines and activity zones are identified in drawings included in Annexure 6.
- Tracking of equipment activity as follows:
  - The overflow valve of the TSHD will be closed when sailing.

Equipment	Time	Date	Coordinates	Other
TSHD	✓	✓	Dredging – x,y,z of dragheads (northing, easting, depth to Chart Datum) Sailing and placement of dredged material – x,y (northing, easting)	Status of cycle (i.e. dredging, sailing, placement of dredged material)
Backhoe Dredge and Grab Dredge (contaminated material only)	✓	✓	x,y,z bucket (northing, easting, depth to Chart Datum)	Nil
Split hopper barges	✓	✓	x,y (northing, easting)	Nil

17. **Dredging of consolidated and unconsolidated contaminated sediments**

- Contaminated sediment exists in the Yarra River, Maribyrnong River, Williamstown and Port Melbourne Channels, Hobsons Bay and associated swing basins, piers and berths. Dredging of contaminated sediment will be conducted with the following equipment:
  - TSHD;
  - grab dredge;
  - backhoe dredge; and
  - sweep / water injection.

Activity

18. **Dredging of consolidated uncontaminated sediments**

- Where uncontaminated and consolidated sediments are identified to exist in the Yarra River, Maribyrnong River, Williamstown and Port Melbourne Channels, Hobsons Bay and associated swing basins, piers and berths, dredging of consolidated and uncontaminated sediment to be conducted with the following equipment:
  - TSHD;

<table>
<tr><th colspan="3">Dredging and plume</th></tr>
<tr><td colspan="2">– grab dredge;
– backhoe dredge; and
– sweep.
19. Dredging of unconsolidated uncontaminated sediments and loose material
▪ Uncontaminated and unconsolidated sediments and loose material exist in the South Channel and the Entrance. Dredging of unconsolidated and uncontaminated sediment to be conducted with the following equipment:
– TSHD.
– sweep</td><td></td></tr>
<tr><td colspan="2">Environmental limit</td><td>Monitoring program</td></tr>
<tr><td colspan="2">Not applicable to this PDS</td><td>Not applicable to this PDS</td></tr>
<tr><td>Contingencies</td><td colspan="2">Not applicable to this PDS</td></tr>
<tr><td colspan="3">Conformance with environmental controls specified in this PDS.</td></tr>
<tr><td colspan="3">All dredging activities in the Entrance, including use of the TSHD.</td></tr>
</table>

Table 9 - Dredging and plume PDS

<table>
<tr><th colspan="4">Entrance Activities</th></tr>
<tr><td>Objective</td><td colspan="3">To appropriately manage activities in the Entrance.</td></tr>
<tr><td>Target</td><td colspan="3">Conformance with all environmental controls specified in this PDS.</td></tr>
<tr><td>Application</td><td colspan="3">Activities in the Entrance</td></tr>
<tr><td colspan="3">Environmental controls</td><td>Project phase</td></tr>
<tr><td colspan="3">20. Dredging in the Entrance
▪ For Rip Bank, all channel dredging works within 50 m of the canyon edge will be undertaken with the dredge operating in a southerly direction;
▪ For Nepean Bank, all dredging works will be conducted away from the canyon edge towards the plateau;
▪ A towed video survey shall be conducted prior to any dredging; and
▪ Works will only be undertaken within the workability of the vessel which includes limiting metocean conditions.</td><td>Activity</td></tr>
<tr><td colspan="2">Environmental limit</td><td colspan="2">Monitoring program</td></tr>
<tr><td colspan="2">Not applicable to this PDS</td><td colspan="2">Not applicable to this PDS</td></tr>
<tr><td>Contingencies</td><td colspan="3">Not applicable to this PDS</td></tr>
</table>

Table 10 - Entrance PDS

<table>
<tr><th colspan="3">Dredging schedule</th></tr>
<tr><td>Objective</td><td colspan="2">To develop an appropriate dredging schedule, taking into account the seasonal sensitivities of Port Phillip assets, beneficial uses and values.</td></tr>
<tr><td>Target</td><td colspan="2">Conformance with environmental controls specified in this PDS.</td></tr>
<tr><td>Application</td><td colspan="2">All dredging activities in Yarra River, Williamstown Channel, Port Melbourne Channel, South Channel and at the Entrance.</td></tr>
<tr><td colspan="2">Environmental controls</td><td>Project phase</td></tr>
<tr><td colspan="2">21. Campaign dredging schedule
▪ The dredging schedule for each campaign will be submitted to DEECA before implementation.
▪ Campaign dredging schedule to include:
– dredging technology;
– dredging configuration (i.e. number and location of dredges); and
– timing, duration and sequence of dredging in Project Areas.</td><td>Pre–Activity

Activity</td></tr>
<tr><td colspan="2">22. Consideration of seasonal sensitivities
▪ No dredging permitted between 18 December and 31 January in the South of Bay to mitigate impacts on the recreation and tourism activities during the holiday season;
▪ No dredging using the TSHD in the Yarra River or Williamstown Channels between 15 October to 30 November to protect migration of the endangered Australian grayling species;
▪ Dredging using the TSHD in Yarra River between 1 April and 31 July restricted to no more than two calendar months in any one year, or equivalent in days to protect Australian grayling larval drift; and
▪ For each campaign schedule, consideration will be given to seasonal sensitivities and preferred seasons identified in Table 14 ‘Key Seasonal Sensitivities and Preferred Seasons’. The decision process, including how seasonal sensitivities were considered, will be documented.</td><td>Activity</td></tr>
<tr><td colspan="2">Environmental limit</td><td>Monitoring program</td></tr>
<tr><td colspan="2">Not applicable to this PDS</td><td>Not applicable to this PDS</td></tr>
<tr><td>Contingencies</td><td colspan="2">Not applicable to this PDS</td></tr>
</table>

Table 11 - Dredging schedule PDS

<table>
<tr><th colspan="3">Dredged material management</th></tr>
<tr><td>Objective</td><td colspan="2">To manage and track the placement of dredged material.
To dispose of and manage dredged material appropriately within the DMGs.
To manage the PoMDMG to the standard required for long-term containment of contaminated material.</td></tr>
<tr><td>Target</td><td colspan="2">Conformance with environmental controls specified in this PDS.</td></tr>
<tr><td>Application</td><td colspan="2">All dredged material placement and DMG management activities in the PoMDMG and SEDMG.</td></tr>
<tr><td colspan="2">Environmental controls</td><td>Project phase</td></tr>
<tr><td colspan="2">23. Dredged material placement.
• DMGs – all dredged material placement activities to take place within the specified DMGs (including associated activity zones) set out in drawings in Annexure 6.
• Dredged material placement – All dredged material to be placed in accordance with Table 13 ‘Dredging Summary’
• Dredging and disposal locations to be recorded as per tracking of equipment table (refer to Table 9 ‘Dredging and plume PDS’).
• Dredged material placement will not commence if a cetacean is sighted within 300 m of the TSHD placing material into a DMG. If a cetacean is sighted, placement can commence if the whale has been seen to move beyond 300 m, or has not been sighted within 300 m for at least 15 minutes.</td><td>Activity</td></tr>
<tr><td colspan="2">24. DP23-33 Monitoring and Management Framework (including management intervention measures)
<table>
<tr><th>Dredging Schedule</th><th>Monitoring Regime</th></tr>
<tr><td rowspan="2">First Dredging Campaign:</td><td>Dredge material: Dredge hopper/barge sampling (TSHD/Backhoe) and sediment testing, including density (bulk, dry and particle) and shear strength, to determine sediment properties.</td></tr>
<tr><td>1 month after dredging completed: Sample 5 sediment cores from placed material at either the northern uncapped site or an area outside of the DMG for a control site. Square arrangement with one sample in the middle. Results can be averaged or looked at individually. Test top 20mm, then at 0.25m and 0.5m core depth for baseline density and shear strength.</td></tr>
<tr><td>Year 1-2 After Placement:</td><td>6 month intervals - Collect core samples of 0.5 m depth and test for density and shear strength.</td></tr>
<tr><td>Following Years:</td><td>To be determined and actioned following the results of Years 1-2 monitoring.</td></tr>
<tr><td rowspan="2">Other Monitoring Requirements (after completion of dredging in 2023)</td><td>Additional sediment monitoring requirements approved by DEECA consistent with DEECA’s ‘Seafloor Integrity Project’ (refer DP23-33 Risk Report).</td></tr>
<tr><td>Bioaccumulation study to be approved by DEECA</td></tr>
<tr><td>Bioturbation</td><td>Annual density survey by a qualified marine biologist.
If significant bioturbation is present, bioaccumulation testing at representative site within the DMG and reference site outside the DMG.</td></tr>
<tr><td>Survey</td><td>Annual MBES survey as per the current hydrographic monitoring requirements to determine any required management actions.</td></tr>
</table></td><td>Activity</td></tr>
</table>

Dredged material management

Depending on the results of the monitoring program, the following management trigger points and management actions are proposed:

Item	Trigger	Management Action
Consolidation	10-year ARI wind speed persisting for 3 hours and annual MBES survey shows sediment erosion on the seabed	Capping of affected sediment within clean sand within 12-18 months
Bioturbation	Established link between bioturbation (burrowing density) and bioaccumulation of toxicants	Capping of affected sediment within clean sand within 12-18 months

25. **PoMDMG – final capping** — Activity

- Construction of final cap for PoMDMG when at capacity (and/or if an intermediate cap is required based on the DP23-33 monitoring and management regime):
  - capping material to be sourced from South Channel and / or SEDMG as set out in the drawings in Annexure 6.
  - capping material to be placed in accordance with the Capping Protocol detailed in Annexure 7.

26. **PoMDMG – ongoing maintenance and inspection** — Post–Activity

- Maintenance and inspection procedures to be put in place for the long-term management of the PoMDMG and incorporated into PoM's operations management system.
- Ongoing inspections, based on acoustic techniques, of representative areas of any required intermediate capping layers (based on the proposed monitoring and management regime or final capping layer(s) when the PoMDMG is at capacity will be undertaken in accordance with the Capping Protocol detailed in Annexure 7 at the following intervals after completion of capping:
  - annually
  - within 2 weeks of a storm event (a 1 in 100 year event) or seismic event (greater than 4.5ML on the Richter scale), subject to safety considerations due to weather.

27. **SEDMG** — Activity

- Subject to the results of pre-mobilisation review and the campaign initiation report risk assessment, a minimum 0.5 m thickness of sand material may be placed over Entrance rock material.
- Dredged material to be placed to maximum -15 m below Chart Datum.
- Once the dredged materials have been placed in SEDMG, survey to confirm materials have been placed in accordance with requirements.

Environmental limit	**Monitoring program**
Not applicable to this PDS	Not applicable to this PDS

Contingencies	Not applicable to this PDS

Table 12 - Dredged material management PDS

Project area	Dredging location	General description of material	DMG	Management requirements
Yarra River, Maribyrnong River and Hobsons Bay including Webb Dock, Station Pier and Gellibrand	Channels and at berths, approaches and swing basins	Clays and silts that are deemed contaminated (unconsolidated contaminated sediments)	PoMDMG	If dredged by BHD disposal directly from barge. Requires bunding. If dredged by TSHD determine disposal method (ie. bottom doors, diffuser etc.) via risk assessment. Requires bunding.
		Clays and silts that are demonstrated to be uncontaminated (consolidated uncontaminated sediments)	PoMDMG	If dredged by BHD disposal directly from barge. If dredged by TSHD disposal via bottom doors. Material may be utilised for bund maintenance.
		Clays and silts that are deemed contaminated (consolidated contaminated sediments)	PoMDMG	If dredged by BHD disposal directly from barge. Requires bunding. If dredged by TSHD determine disposal method (ie. via bottom doors, diffuser etc.) via risk assessment. Requires bunding.
		Clays and silts that are demonstrated to be uncontaminated (unconsolidated uncontaminated sediments)	PoMDMG	If dredged by BHD disposal directly from barge. If dredged by TSHD disposal via bottom doors. Material may not be utilised for bund maintenance.
North of the Bay	Port Melbourne Channel	Clays and silts that are deemed contaminated (unconsolidated contaminated sediments)	PoMDMG	If dredged by BHD disposal directly from barge. Requires bunding. If dredged by TSHD determine disposal method (ie. via bottom doors, diffuser etc.) via risk assessment. Requires bunding.
South of the Bay	South Channel	Medium to coarse sand	Final capping in PoMDMG	Disposal via spreader
			SEDMG	Disposal directly from hopper. Need for capping material to be determined via risk assessment. Other material to be disposed of in SEDMG.
The Entrance	The Entrance	Loose material (cobbles)	SEDMG (if required)	If removal to SEDMG is required, disposal directly from hopper.

Table 13 - Dredging summary

Project area	Key seasonal sensitivities	Preferred seasons
Yarra River, Maribyrnong River and Hobsons Bay	Denitrification, algal blooms, seabirds, MPB, little penguins, fish (in particular anchovy and Australian grayling and mudfish), eels, commercial fishing, recreational fishing (the Warmies), yachting, boating, beach use.	Winter is ranked the most preferred season for dredging to occur. Autumn and summer are ranked as second and third preference respectively. Spring is considered least preferred in this project area primarily due to the Australian grayling.
North of the Bay	Denitrification, algal blooms, seabirds, MPB, seagrass, little penguins, dolphins, fish (in particular anchovy), commercial fishing, recreational fishing, swimming, boating, yachting, beach use.	Winter is ranked the most preferred season for dredging to occur in this project area. Autumn and spring are ranked as equally preferred, while summer is considered the least preferred season for dredging in the North of the Bay Project Area.
South of the Bay	Algal blooms, nutrient cycling, denitrification, seagrass, macroalgae, seaweed, MPB, seabirds, little penguins, dolphins, whales, fish, commercial fishing (including abalone), aquaculture, tourism, recreational fishing, swimming, boating, yachting, beach use.	Winter is ranked the most preferred season for dredging to occur in this project area. Autumn is ranked as second preference and spring as third preference. Summer is the least preferred season for dredging to occur in the project area.
The Entrance	Seabirds, little penguins, whales, fish, commercial fishing (including abalone), tourism, recreational diving, beach use.	Winter is ranked the most preferred season for dredging to occur in this project area. Autumn and spring are ranked as second and third preference respectively, while summer is considered the least preferred season for dredging the Entrance.

Table 14 - Key seasonal sensitivities and preferred seasons

Annexure 3 Environmental monitoring and contingency plans

Summary

This section contains the Airborne Noise Contingency Plan. A summary is provided in Table 15 below and management actions are described in Table 17.

Program / plan	Rationale	Procedure and indicator	Monitoring location	Associated PDS
Airborne Noise Contingency Plan	To comply with EPA Noise Protocol.	A desktop noise assessment of new dredging vessels and major equipment and response to noise complaints.	Yarra River and Hobsons Bay, North of the Bay, South of the Bay, the Entrance.	Maintenance management (all activities)

Table 15 - Summary of environmental monitoring programs and contingency plans

Airborne Noise Contingency Plan

Context

This Airborne Noise Contingency Plan relates to a potential or actual exceedance of the EPA Noise Protocol from dredging activities.

Response level

Two events that will trigger contingency actions to appropriately manage airborne noise emissions are defined by either:

- airborne noise measurement at key locations is evaluated as likely to exceed EPA Noise Protocol unless management contingencies are taken; or
- a noise complaint has been received from an area represented by a key monitoring location within a distance from dredging activities that audible levels of noise disturbance are possible.

Environmental limit

The airborne noise environmental limit relates to the legislative requirements for noise under EPA Noise Protocol. This is required:

- for TSHD when working closer to key locations of Queenscliff and McCrae/ Dromana/ Rye in the South of the Bay
- for TSHD and BHGD when working closer to the key locations of Port Melbourne and Williamstown in the North of the Bay
- in response to a noise complaint that has been received within a distance from dredging operations that audible levels of noise disturbance are possible.

Table 16 shows the SEPP N-1 time period classification, to which different limit levels apply.

SEPP N-1 time period classification	
Day	7am to 6pm weekdays 7am to 1pm Saturdays
Evening	6pm to 10pm weekdays 1pm to 6pm Saturdays 7am to 6pm Sundays 7am to 6pm public holidays
Night	10pm to 7am weekdays 6pm to 7am weekends 6pm to 7am public holidays

Table 16 - EPA Noise Protocol time period classifications

Contingency for potential or actual exceedance

The process for addressing a potential or actual exceedance of the noise environmental limit from dredging activities is provided in Annexure 3, Figures 3 and 4. Management actions are provided in Table 17.

Noise complaints will be managed via the complaint response process described in Annexure 5.

Management actions

Management actions
New vessel or equipment management actions: Where the desktop noise assessment of vessels or equipment indicates it may not conform to EPA Noise Protocol, appropriate action to be taken. Management options include: ▪ selection of alternative vessel/equipment; ▪ modification to vessel/equipment; and ▪ restrictions on use of vessel/equipment.
In response to complaints, where the complaint is identified to have some basis for the complaint, noise monitoring may be used to assess compliance with SEPP N-1.
Management actions if activity does not meet/not likely to meet EPA Noise Protocol. If noise monitoring results and/or desktop noise assessment predict EPA Noise Protocol limits have been exceeded or may be exceeded unless appropriate management action is taken, then the following options for action may be taken: ▪ rescheduling high noise equipment to operate for daytime works only, or control locations of evening or night-time use to greater distances from key locations sensitive to noise; and/or ▪ evaluate ways to reduce equipment noise emissions if required (e.g. decreasing operating energy, installing additional acoustic dampening covers and mufflers etc.).

Table 17 - Management actions – airborne noise

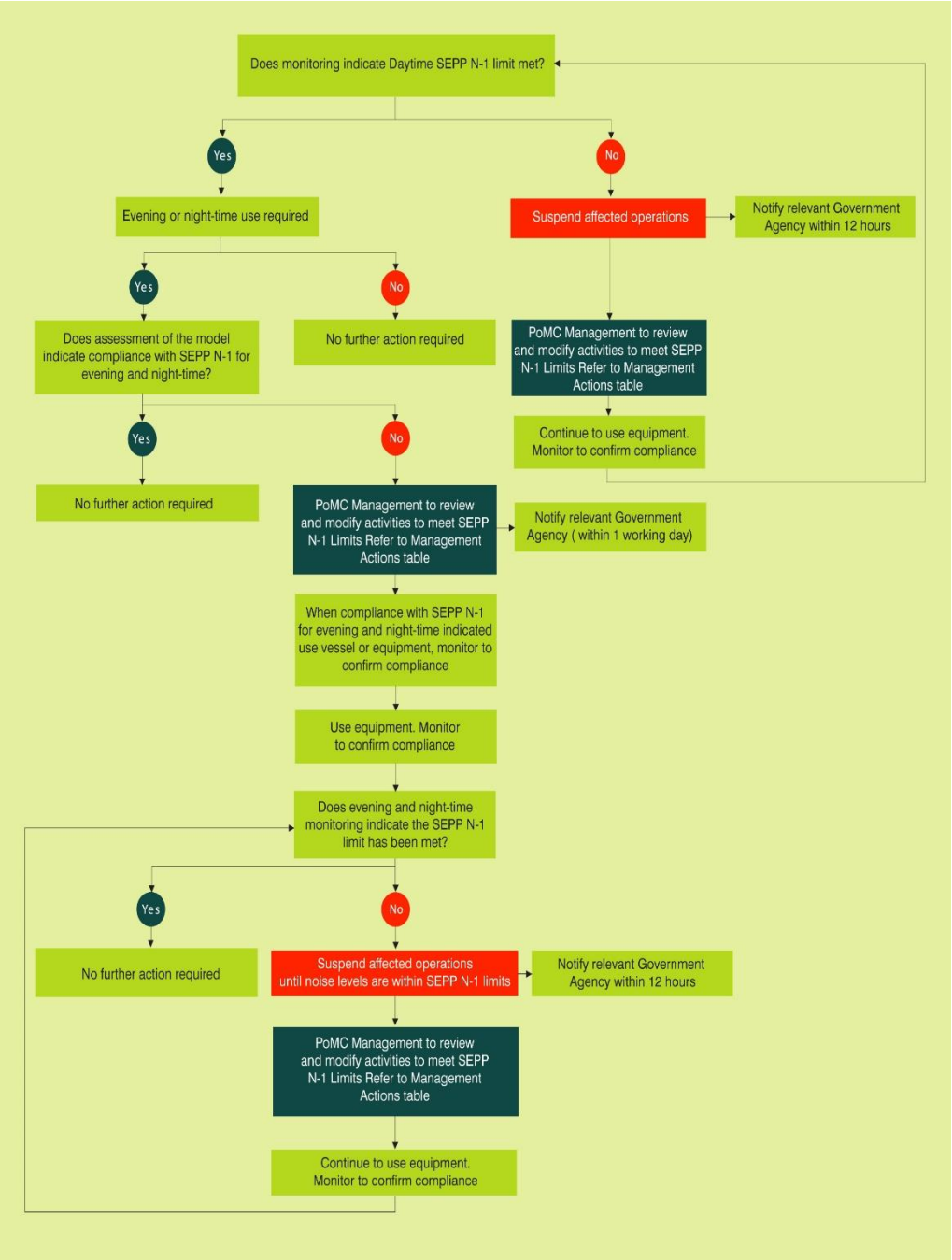


Figure 2 - Airborne noise – existing equipment contingency flowchart

Notes: SEPP N-1 levels are equivalent to the new EPA Noise Protocol limits
PoMC in the flowchart refers to Port of Melbourne Operations)

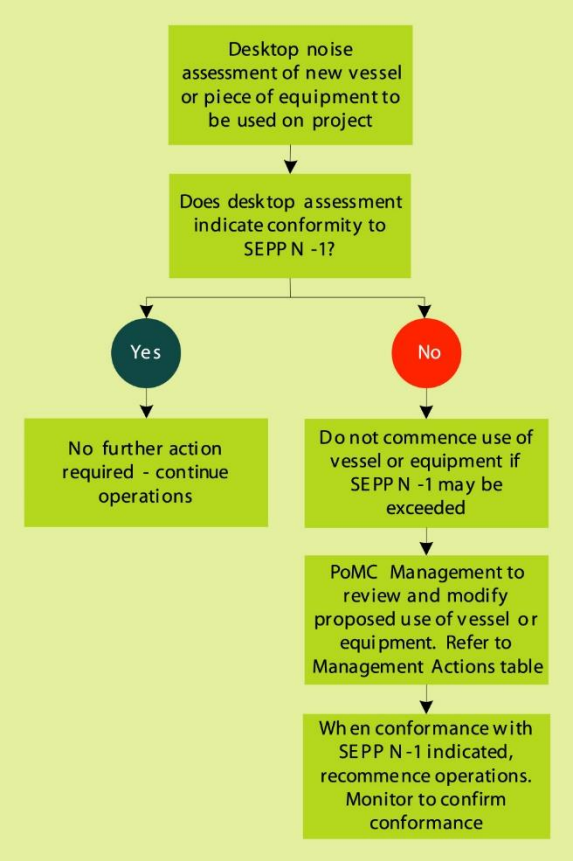
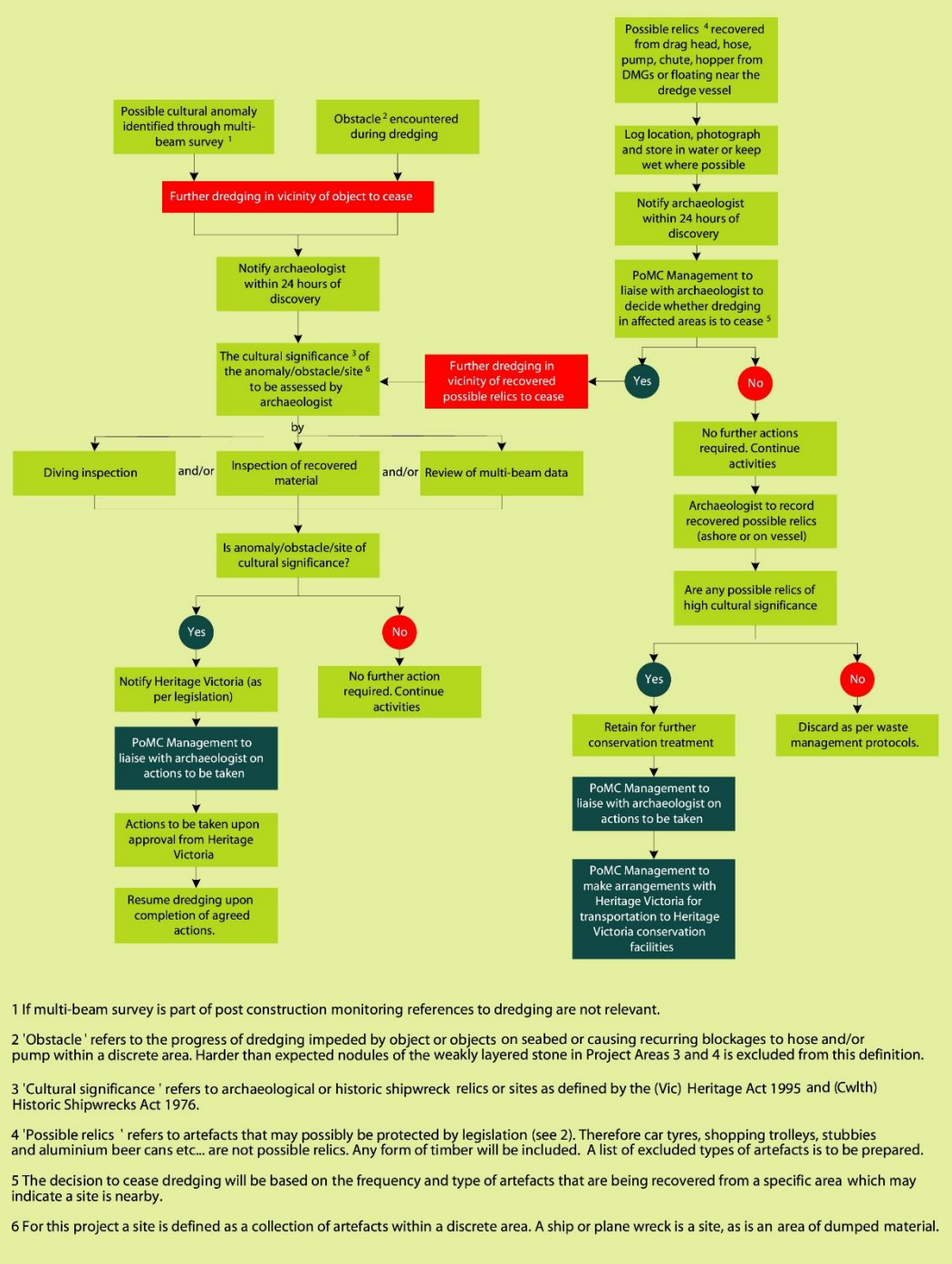


Figure 3 - Airborne noise – new equipment contingency flowchart

Notes: SEPP N-1 levels are equivalent to the new EPA Noise Protocol limits PoMC in the flowchart refers to Port of Melbourne Operations)

Annexure 4 Heritage Marine Based Response Processes

This heritage (marine-based) response process relates to the potential for previously unidentified heritage items or sites to be identified during dredging activities. The response process flowchart is shown below.



1 If multi-beam survey is part of post construction monitoring references to dredging are not relevant.

2 'Obstacle ' refers to the progress of dredging impeded by object or objects on seabed or causing recurring blockages to hose and/or pump within a discrete area. Harder than expected nodules of the weakly layered stone in Project Areas 3 and 4 is excluded from this definition.

3 'Cultural significance ' refers to archaeological or historic shipwreck relics or sites as defined by the (Vic) Heritage Act 1995 and (Cwlth) Historic Shipwrecks Act 1976.

4 'Possible relics ' refers to artefacts that may possibly be protected by legislation (see 2). Therefore car tyres, shopping trolleys, stubbies and aluminium beer cans etc... are not possible relics. Any form of timber will be included. A list of excluded types of artefacts is to be prepared.

5 The decision to cease dredging will be based on the frequency and type of artefacts that are being recovered from a specific area which may indicate a site is nearby.

6 For this project a site is defined as a collection of artefacts within a discrete area. A ship or plane wreck is a site, as is an area of dumped material.

Figure 4 - Heritage (marine-based) response process flowchart

(note PoMC in the flowchart below refers to Port of Melbourne Operations)

Annexure 5 Complaints Response Process

The complaints response process flowchart is shown below and management actions are described in Table 18.

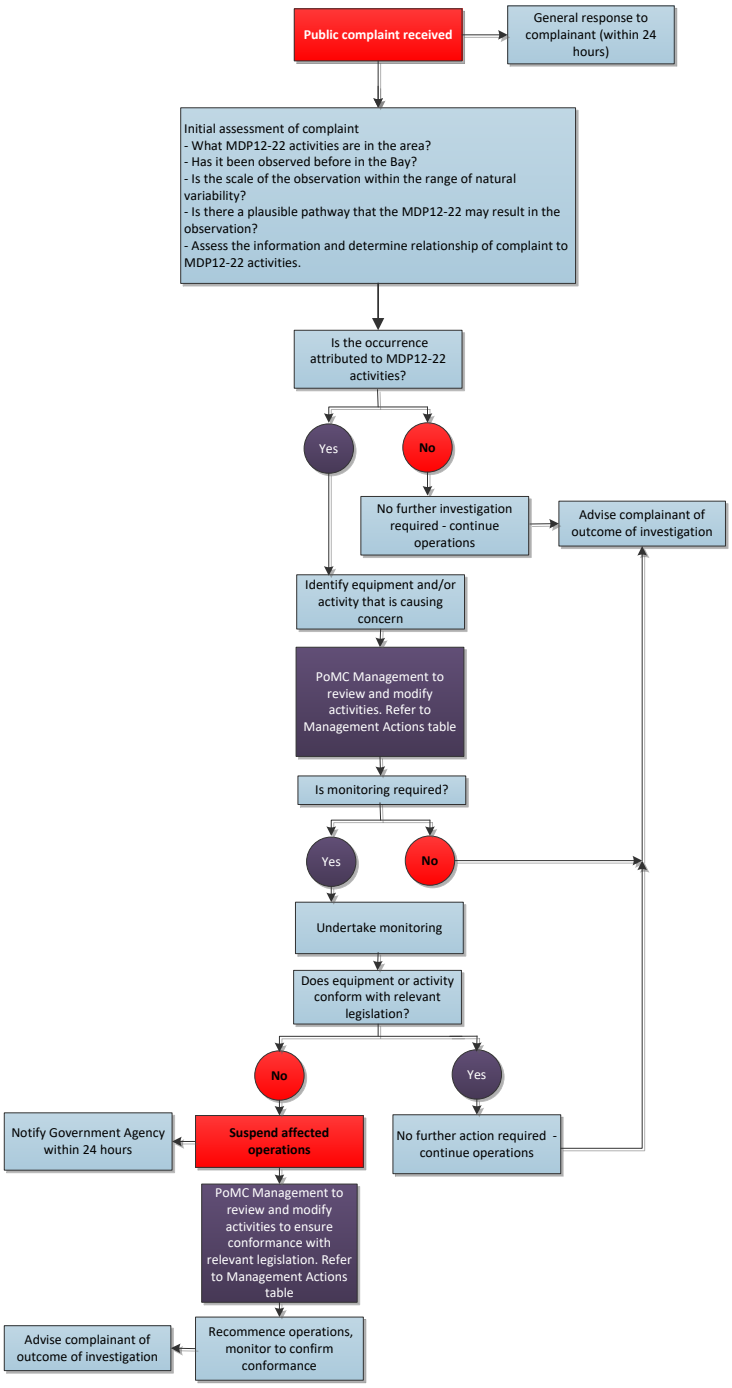


Figure 5 - Complaints response process flowchart

(note PoMC in the flowchart below refers to Port of Melbourne Operations)

Management actions
Management actions if a complaint is received: If a complaint is received, a general response will be given to the complainant within 24 hours. The timeframe for a response to a complaint (aside from the initial response) is dependent on the nature of the complaint and the scale of investigation (if required). It is expected that there will be management action within 24 hours of the initial assessment of the complaint. The following options for action may be taken: ▪ if the complaint is a single event then no monitoring may be required if the cause cannot be determined; and/or ▪ if there are a number of complaints relating to the same issue then monitoring may be considered as part of the investigation. Where the assessment of vessels, equipment or activity indicates that it may not conform to relevant legislation, appropriate action to be taken. Management options include: ▪ selection of alternative vessel/equipment; ▪ modification to vessel/equipment; ▪ restrictions on use of vessel/equipment; and ▪ other actions as deemed appropriate.

Table 18 - Management actions – complaints response

Annexure 6 Drawings

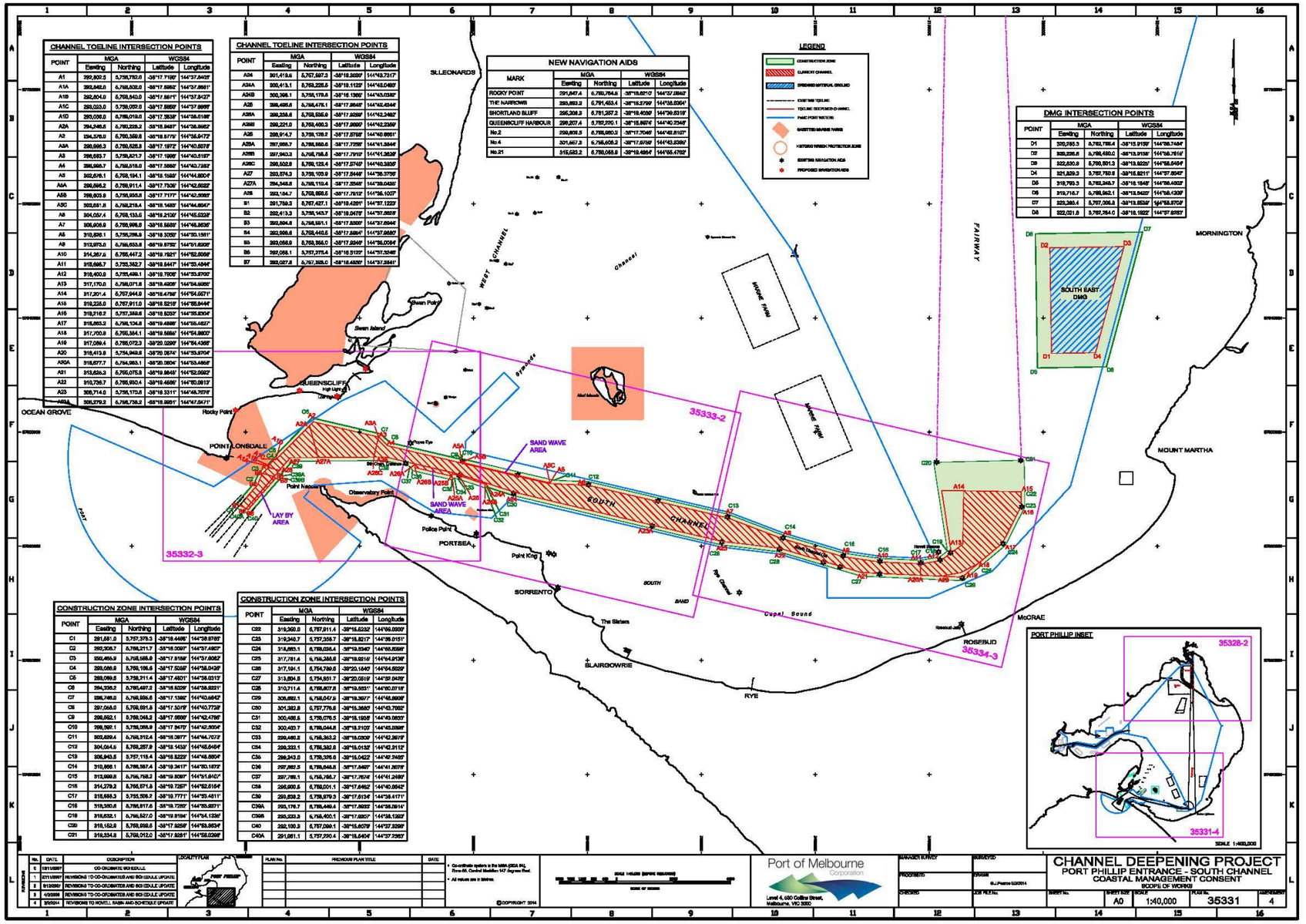
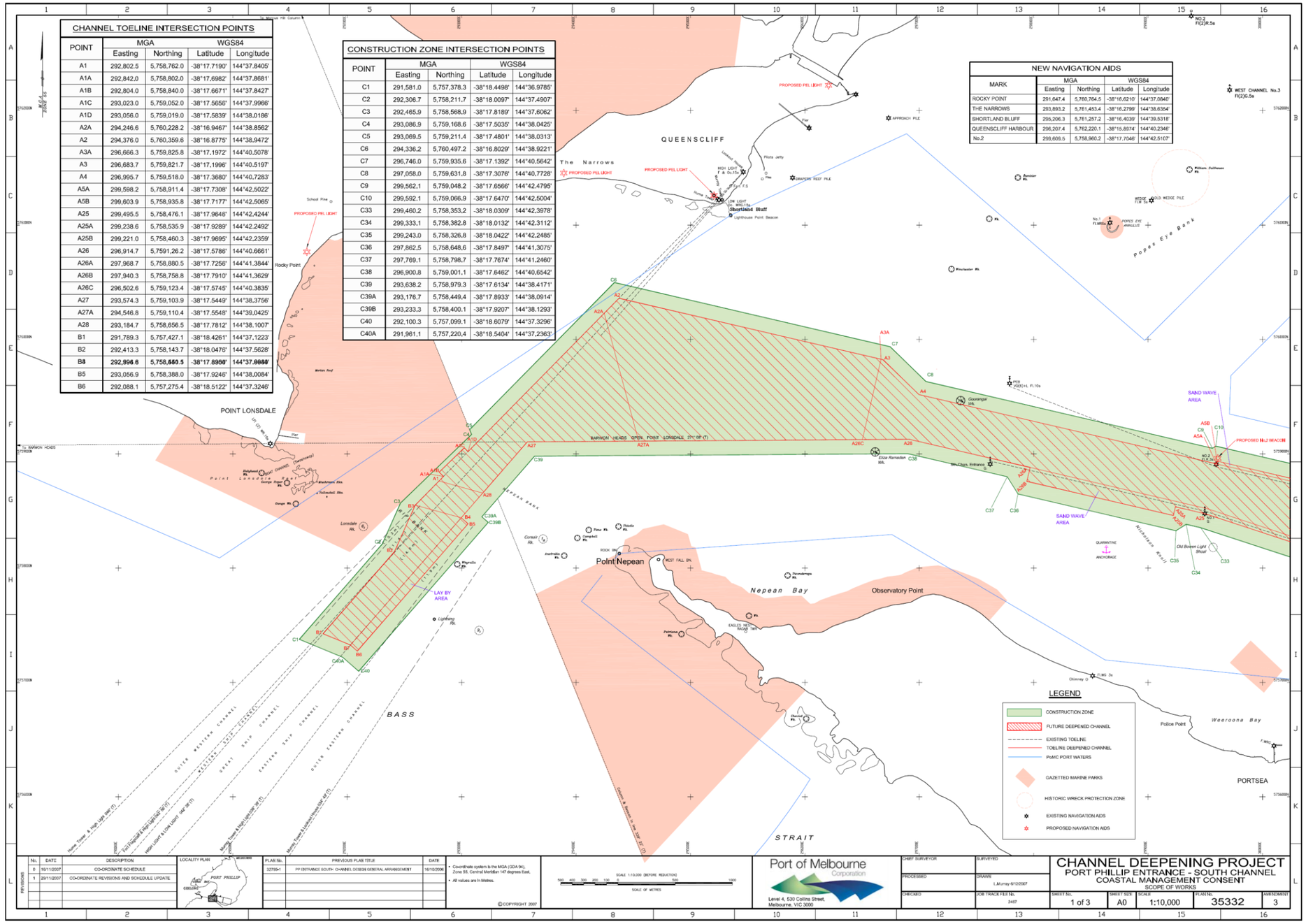


Figure 6 - Activity Zone Definition South Channel Plan Layout (Dwg 35331-4)



CHANNEL TOELINE INTERSECTION POINTS				
POINT	MGA		WGS84	
	Easting	Northing	Latitude	Longitude
A1	292,802.5	5,758,762.0	-38°17.7190'	144°37.8405'
A1A	292,842.0	5,758,802.0	-38°17.6982'	144°37.8681'
A1B	292,804.0	5,758,840.0	-38°17.6671'	144°37.8427'
A1C	293,023.0	5,759,052.0	-38°17.5656'	144°37.9966'
A1D	293,056.0	5,759,019.0	-38°17.5839'	144°38,0186'
A2A	294,246.6	5,760,228.2	-38°16.9467'	144°38.8562'
A2	294,376.0	5,760,359.6	-38°16.8775'	144°38,9472'
A3A	296,666.3	5,759,825.8	-38°17,1972'	144°40,5078'
A3	296,683.7	5,759,821.7	-38°17,1996'	144°40,5197'
A4	296,995.7	5,759,518.0	-38°17.3680'	144°40,7283'
A5A	299,598.2	5,758,911.4	-38°17.7308'	144°42,5022'
A5B	299,603.9	5,758,935.8	-38°17.7177'	144°42,5065'
A25	299,495.5	5,758,476.1	-38°17.9646'	144°42,4244'
A25A	299,238.6	5,758,535.9	-38°17.9289'	144°42.2492'
A25B	299,221.0	5,758,460.3	-38°17.9695'	144°42,2359'
A26	296,914.7	5,7591,26.2	-38°17.5786'	144°40.6661'
A26A	297,968.7	5,758,880.5	-38°17.7256'	144°41.3844'
A26B	297,940.3	5,758,758.8	-38°17.7910'	144°41,3629'
A26C	296,502.6	5,759,123.4	-38°17.5745'	144°40.3835'
A27	293,574.3	5,759,103.9	-38°17.5449'	144°38,3756'
A27A	294,546.8	5,759,110.4	-38°17.5548'	144°39,0425'
A28	293,184.7	5,758,656.5	-38°17.7812'	144°38,1007'
B1	291,789.3	5,757,427.1	-38°18.4261'	144°37,1223'
B2	292,413.3	5,758,143.7	-38°18.0476'	144°37.5628'
B4	292,996.8	5,758,660.5	-38°17.8950'	144°37.9684'
B5	293,056.9	5,758,388.0	-38°17.9246'	144°38,0084'
B6	292,088.1	5,757,275.4	-38°18.5122'	144°37.3246'

CONSTRUCTION ZONE INTERSECTION POINTS				
POINT	MGA		WGS84	
	Easting	Northing	Latitude	Longitude
C1	291,581,0	5,757,378.3	-38°18.4498'	144°36.9785'
C2	292,306.7	5,758,211,7	-38°18.0097'	144°37,4907'
C3	292,465.9	5,758,568.9	-38°17.8189'	144°37,6062'
C4	293,086,9	5,759,168.6	-38°17.5035'	144°38,0425'
C5	293,069.5	5,759,211,4	-38°17.4801'	144°38,0313'
C6	294,336.2	5,760,497.2	-38°16.8029'	144°38.9221'
C7	296,746.0	5,759,935.6	-38°17.1392'	144°40,5642'
C8	297,058,0	5,759,631.8	-38°17.3076'	144°40,7728'
C9	299,562,1	5,759,048.2	-38°17.6566'	144°42,4795'
C10	299,592.1	5,759,066.9	-38°17.6470'	144°42,5004'
C33	299,460.2	5,758,353,2	-38°18.0309'	144°42,3978'
C34	299,333,1	5,758,382.8	-38°18.0132'	144°42,3112'
C35	299,243,0	5,758,326,8	-38°18.0422'	144°42,2485'
C36	297,862,5	5,758,648,6	-38°17.8497'	144°41,3075'
C37	297,769,1	5,758,798,7	-38°17.7674'	144°41,2460'
C38	296,900,8	5,759,001,1	-38°17.6462'	144°40,6542'
C39	293,638.2	5,758,979.3	-38°17.6134'	144°38.4171'
C39A	293,176.7	5,758,449,4	-38°17.8933'	144°38,0914'
C39B	293,233,3	5,758,400.1	-38°17,9207'	144°38.1293'
C40	292,100.3	5,757,099.1	-38°18.6079'	144°37.3296'
C40A	291,961,1	5,757,220,4	-38°18.5404'	144°37,2363'

NEW NAVIGATION AIDS				
MARK	MGA		WGS84	
	Easting	Northing	Latitude	Longitude
ROCKY POINT	291,647.4	5,760,764.5	-38°16.6210'	144°37.0840'
THE NARROWS	293,893.2	5,761,453.4	-38°16.2799'	144°38.6354'
SHORTLAND BLUFF	295,206.3	5,761,257.2	-38°16.4039'	144°39.5318'
QUEENSCLIFF HARBOUR	296,207.4	5,762,220.1	-38°15.8974'	144°40.2346'
No.2	299,609.5	5,758,960.2	-38°17,7046'	144°42.5107'

Figure 7 - Activity Zone Definition South Channel (Dwg 35332-3)

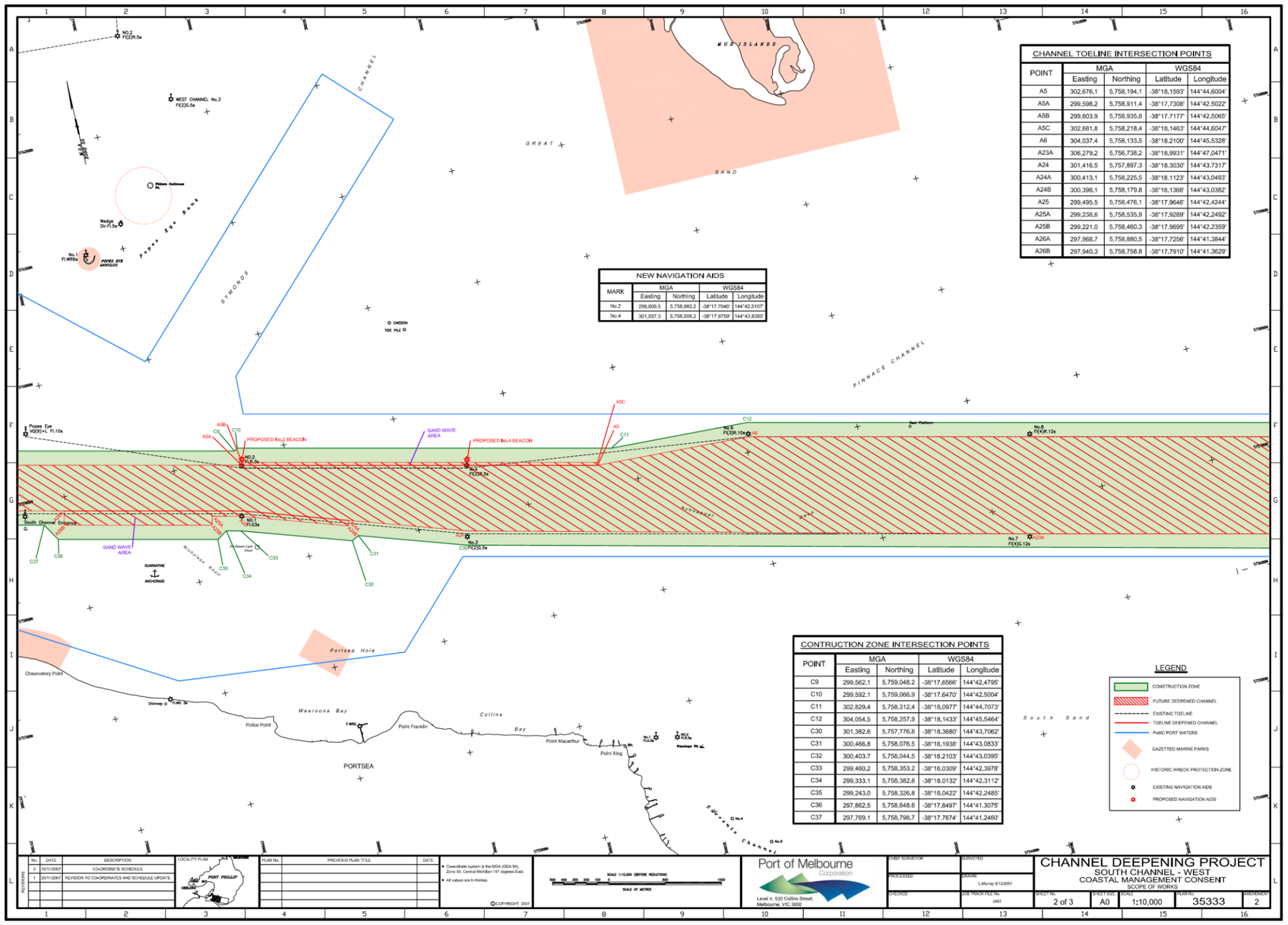
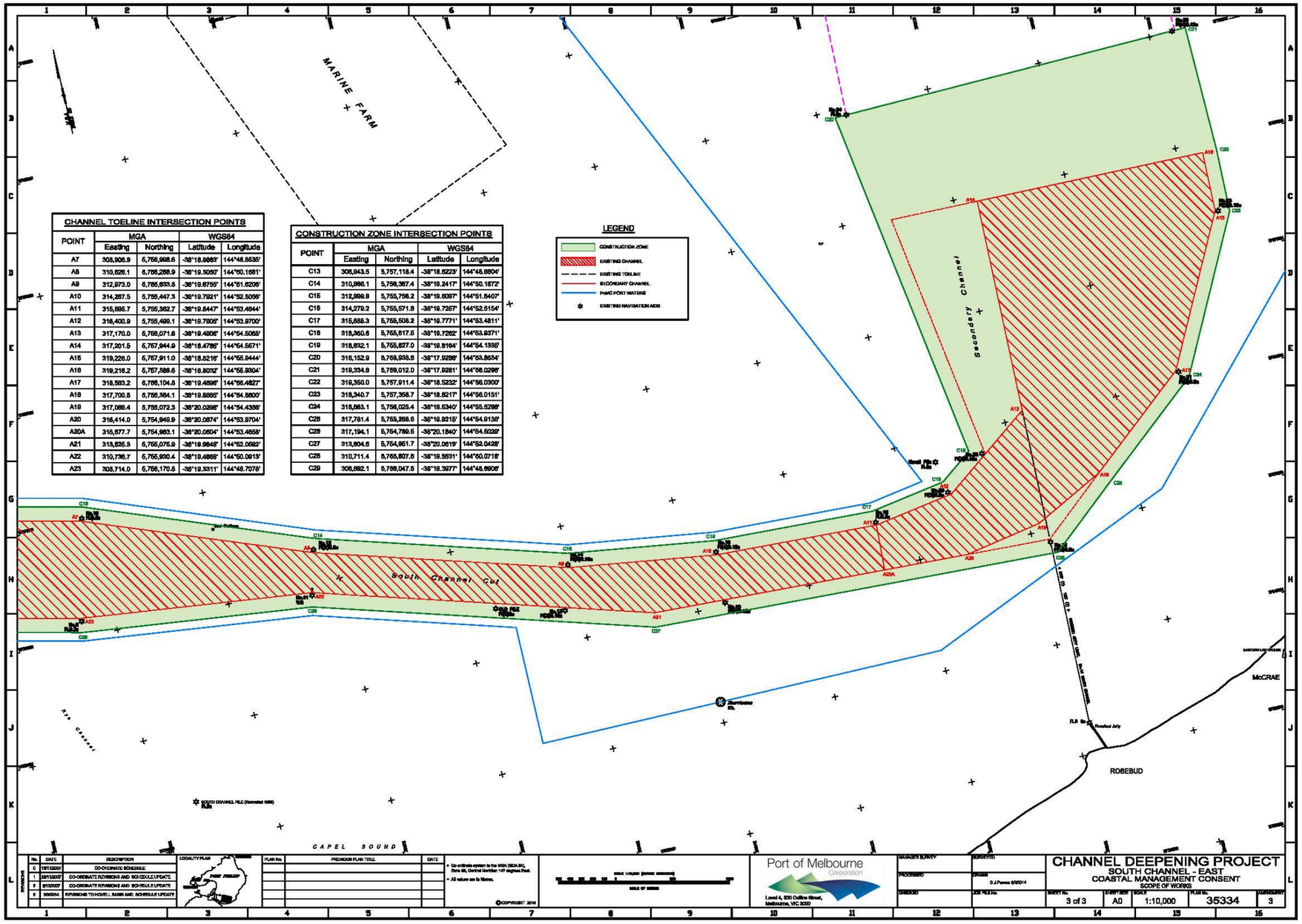


Figure 8 - Activity Zone Definition South Channel (Dwg 35333-2)



CHANNEL TOELINE INTERSECTION POINTS

POINT	MGA		WGS84	
	Easting	Northing	Latitude	Longitude
A7	308,906.9	5,756,998.6	-38°18.8863'	144°48.8635'
A8	310,826.1	5,756,268.9	-38°19.3050'	144°50.1681'
A9	312,973.0	5,755,633.8	-38°19.6755'	144°51.6206'
A10	314,287.5	5,755,447.3	-38°19.7921'	144°52.5056'
A11	315,695.7	5,755,362.7	-38°19.8447'	144°53.4844'
A12	316,400.9	5,755,498.1	-38°19.7905'	144°53.9700'
A13	317,170.0	5,756,071.6	-38°19.4906'	144°54.5055'
A14	317,201.5	5,757,944.9	-38°18.4786'	144°54.5571'
A15	319,226.0	5,757,911.0	-38°18.5216'	144°55.9444'
A16	319,216.2	5,757,589.6	-38°18.6032'	144°55.9304'
A17	318,583.2	5,756,104.6	-38°19.4696'	144°55.4827'
A18	317,700.8	5,755,984.1	-38°19.5885'	144°54.8800'
A19	317,089.4	5,755,072.3	-38°20.0298'	144°54.4358'
A20	316,414.0	5,754,949.9	-38°20.0874'	144°53.9704'
A20A	315,677.7	5,754,983.1	-38°20.0604'	144°53.4658'
A21	313,626.5	5,755,076.9	-38°19.9846'	144°52.0592'
A22	310,736.7	5,755,930.4	-38°19.4866'	144°50.0913'
A23	308,714.0	5,756,170.8	-38°19.3311'	144°48.7078'

CONSTRUCTION ZONE INTERSECTION POINTS

POINT	MGA		WGS84	
	Easting	Northing	Latitude	Longitude
C13	308,943.5	5,757,118.4	-38°18.8223'	144°48.8804'
C14	310,866.1	5,756,387.4	-38°19.2417'	144°50.1872'
C15	312,999.9	5,755,756.2	-38°19.6097'	144°51.6407'
C16	314,279.2	5,755,571.8	-38°19.7257'	144°52.5154'
C17	315,688.3	5,755,508.2	-38°19.7771'	144°53.4811'
C18	316,360.6	5,755,617.5	-38°19.7262'	144°53.9371'
C19	316,832.1	5,755,827.0	-38°19.8164'	144°54.1356'
C20	316,152.9	5,756,938.5	-38°17.9298'	144°53.8634'
C21	319,334.8	5,759,012.0	-38°17.9281'	144°56.0298'
C22	319,350.0	5,757,911.4	-38°18.5232'	144°56.0300'
C23	318,340.7	5,757,358.7	-38°18.8217'	144°56.0151'
C24	318,663.1	5,756,025.4	-38°19.6340'	144°55.5298'
C25	317,761.4	5,755,288.8	-38°19.9215'	144°54.9136'
C26	317,194.1	5,754,789.5	-38°20.1840'	144°54.6229'
C27	313,804.6	5,754,951.7	-38°20.0619'	144°52.0425'
C28	310,711.4	5,755,807.5	-38°19.5531'	144°50.0715'
C29	308,692.1	5,756,047.5	-38°19.3977'	144°48.6906'

Figure 9 - Activity Zone Definition South Channel (Dwg 35334-3)

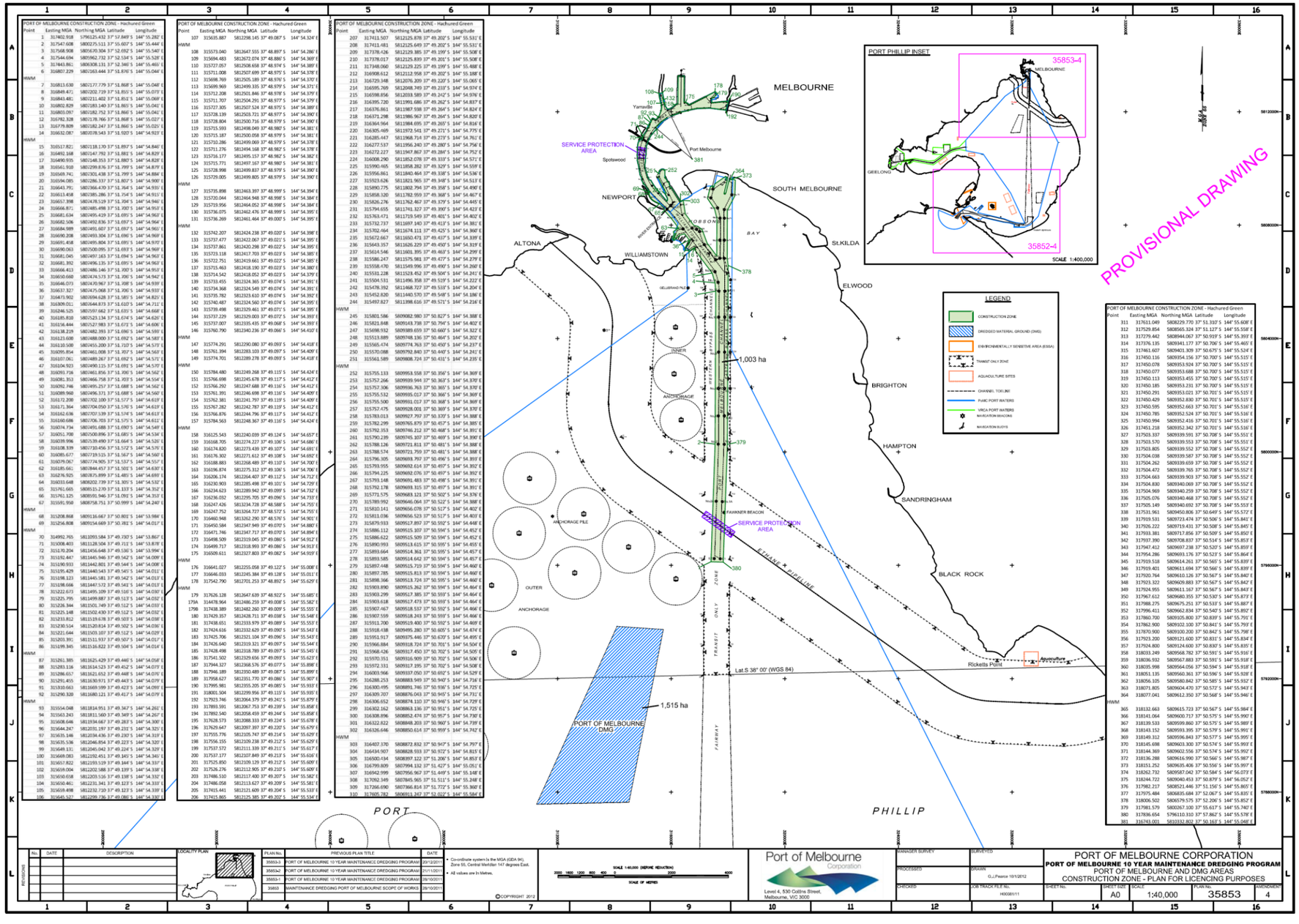


Figure 10 - Activity Zone Definition Northern Port Phillip (Dwg 35853-4)

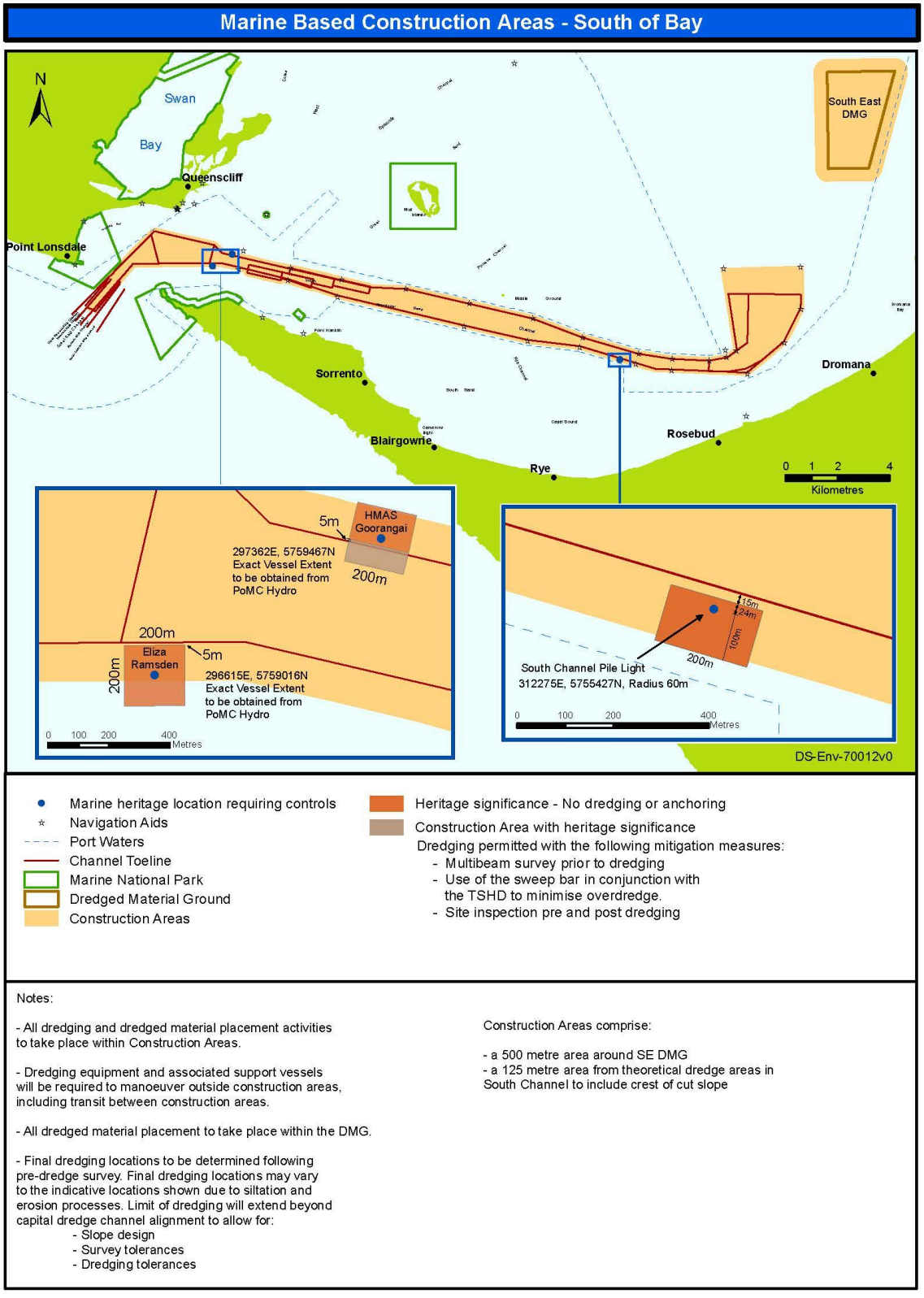


Figure 11 - Marine Based Activity Area South of Bay (Dwg DS-ENV-70012v0)

Annexure 7 Final Capping Protocol

This protocol is applicable to the following:

- The final capping layer when the PoMDMG is at full capacity; and/or
- Any intermediate capping layers determined to be required under the monitoring and management regime as outlined in this EMP.

7.1 Capping Footprint Definition

The operational capping footprint shall be determined prior to the performance of the capping operation by adopting the same criteria as utilised for the capping determination of the MP09-11 dredging campaign, initially approved by DEPI (now DEECA). For details refer below:

- The difference between the pre and most recent post disposal bathymetric surveys will be determined to define the footprint of the contaminated material.
- A 0.296 m difference threshold will be utilised to determine the limit of spatially coherent area of deposition to define the Statistical Footprint (SF).
- The application of GIS smoothing and majority filtering techniques to the Statistical Footprint to produce the Optimised Statistical Footprint (OSF).
- An Operational Capping Footprint (OCF) will be created by conducting a sensibility check of the OSF in conjunction with a review of the disposal event records to ensure that the proposed OCF is robust and caters for any unplanned disposal activities.

7.2 Construction Monitoring and Initial Capping Compliance

- A bathymetric pre-cap survey of the area to be capped will be undertaken to define the surface of the contaminated material.
- The pre-cap bathymetric surface, in conjunction with progress bathymetric surveys during the initial phase of the capping works, will be used to inform operational matters related to the progress of the works. Such operational matters are likely to include evenness of coverage, adjustments to capping methodology and dredge settings.
- When the volume of capping material placed approximates the design volume necessary to allow compliance with the capping thickness requirements or the average capping thickness as defined by the difference between bathymetric surveys is nominally 0.40 m, a sub bottom profile survey (SBPS) will be undertaken.
- SBPS lines will be run at 20 m centres in conjunction with long lines at 100 m centres over the area defined by the OCF.
- A multibeam hydrographic survey will be undertaken at the same time as the SBPS.

- The SBPS results will be interpreted by an appropriately qualified geophysicist to define the thickness of the capping at the location of the SBPS survey lines.
- Following interpretation of the SBPS data, an adjusted capping /dredged material interface will be created, by an appropriately qualified statistician, utilising data analysis techniques to transform the pre cap multibeam survey data based on the relationship to the SBPS data. This approach ensures that the settlement caused by the placement of capping material during construction is appropriately accounted for and that the transformed surface reflects the relief and complexity of the pre cap surface as determined by hydrographic survey techniques.
- Following the above, the difference between the current bathymetric surface and the adjusted pre-cap surface will be used to determine compliance with the capping thickness acceptance criteria where the lower limit of the 95% confidence interval, of the average capping thickness, must be equal to or greater than 0.5 m.
- In addition to the above, the difference between the current bathymetric surface and the adjusted pre-cap surface dataset will be used to determine compliance with the capping thickness spatial distribution acceptance criteria. Acceptance of this criteria is defined as when the lower limit of the 95% confidence interval of the mean capping thickness of a 20 m neighbourhood around each cell, with a value of less than 0.5 m, is equal to or greater than 0.5 m. A 20m neighbourhood is defined as a collection of cells within a 20m radius of a cell with a value of less than 0.5m.
- Compliance with the capping thickness acceptance criteria requirements of the EMP will be on the basis of averaged bathymetric data on a 2 m grid over the OCF.

7.3 Post Construction Monitoring

- The bathymetric pre-cap survey of the capped area will be used as the basis for the definition of the surface of the contaminated material.
- At the time of monitoring as required by the EMP, SBPS lines will be run at 20 m centres in conjunction with long lines at 100 m centres over the area defined by the OCF.
- A multibeam hydrographic survey will be undertaken at the same time as the SBPS.
- The SBPS results will be interpreted by an appropriately qualified geophysicist to define the thickness of the capping at the location of the SBPS survey lines.
- Following interpretation of the SBPS data, an adjusted capping /dredged material interface will be created, by an appropriately qualified statistician, utilising data analysis techniques to transform the pre cap multibeam survey

data based on the relationship to the SBPS data. This approach ensures that the settlement caused by the placement of capping material during construction is appropriately accounted for and that the transformed surface reflects the relief and complexity of the pre cap surface as determined by hydrographic survey techniques.

- Following the above, the difference between the current bathymetric surface and the adjusted pre-cap surface will be used to determine compliance with the capping thickness acceptance criteria where the 95% confidence interval of the average capping thickness must be equal to or greater than 0.5 m.
- Compliance with the capping thickness requirements of the EMP will be on the basis of averaged bathymetric data on a 2 m grid reconciled over the OCF.