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**Office of the Environmental Monitor**  
Report for Channel Deepening Independent Audit  
Activity No.2

Focused audit of dredging in the South Channel & mechanisms to protect seagrass  
June 2009



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# Executive Summary

The Channel Deepening Project is being implemented by the Port of Melbourne Corporation (PoMC). Its aim is to deepen shipping channels in Port Phillip Bay and the lower reaches of the Yarra River by dredging to enable ships up to 14 m draught to access the Port of Melbourne.

Victorian and Commonwealth Government environmental approvals for the Project set conditions that the PoMC must adhere to. These include arrangements set out in an Environmental Management Plan (EMP). The EMP sets out 58 "Project Delivery Standards", which are rules about where, when and how the Project must be delivered.

The Office of the Environmental Monitor (Office) has appointed Peter Nadebaum of GHD Pty Ltd (the Auditor) to undertake a series of independent audits of the implementation of the Environmental Management Plan for the Channel Deepening Project (Project). The audits are to meet the requirements of the Office and the Commonwealth for the audit of the Port of Melbourne's annual report on performance.

This report outlines the findings of one of these audits, comprising a *focussed audit of dredging in the South Channel and mechanisms to protect seagrass*. The audit covered the period from 8 February 2008 to 10 April 2009.

## **The Project Delivery Standards**

PDSs have been identified for the CDP to address key environmental risks, effects and legal requirements. The PDSs are a collation of the management and mitigation measures, environmental performance monitoring and contingency plans for the project. The CDP PDSs are:

- » Construction management (all activities);
- » Marine-based works (all areas);
- » Land-based works;
- » Dredging and plume;
- » Dredging schedule;
- » Dredged material management;
- » Entrance dredging; and
- » Hydrohammer use and marine-based pile driving.

It should be noted that the EMP formally defines 8 PDSs, listed above. Within those 8 standards are 58 environmental rules. However, the general convention through the delivery of the CDP has been to refer to the environmental rules individually as PDSs. This convention is continued in these audits and any reference to the 58 PDSs will by definition include the 58 environmental rules.

## **Monitoring Programs**

Three environmental monitoring programs and contingency plans have been developed for the CDP; these are Turbidity, Airborne Noise and Underwater Noise. A further nine baywide monitoring programs, including five sub programs for the fish stock and recruitment program, have been developed. These baywide monitoring programs are designed to provide broader information on the status of key species, habitats and ecological processes in the Port Phillip Bay. These monitoring programs include:

- » Seagrass;
- » Water quality
- » Nutrient cycling
- » Contaminants in fish
- » Algal blooms
- » Little penguins
- » Fish stock and recruitment
  - Sub program 1 Port Phillip Bay trawl
  - Sub program 2a Egg and larval survey
  - Sub program 2b Anchovy study
  - Sub program 3 Recreational fishing
  - Sub program 4 Fish species in seagrass beds
- » Plume intensity and extent
- » Ramsar Wetlands – Key coastal and intertidal vegetation communities.

## **Methodology for the Audit**

The audit methodology was consistent with ISO 19011 and was implemented to meet the specific requirements of the Office and the Commonwealth.

The audit adopted a graded assessment of compliance, involving Full Compliance, “Critical”, “Major” and “Minor” Non-Compliance, Not Applicable and Undetermined.

The audit team included Peter Nadebaum of GHD Pty Ltd (GHD) as the lead auditor, and he was supported by a team of specialist staff from GHD.

## **Findings**

The audit determined that PoMC has a well developed environmental management system and an excellent system for documenting information relating to the CDP that is relevant to confirming compliance with the EMP and the PDSs and monitoring programs. PoMC records a great deal of data on a very detailed (30 second) basis relating to dredging work that is carried out, and detailed scrutiny of dredging on any particular day of the dredge program is possible. PoMC responded to the many requests by the audit team for information and evidence, and a large body of information was made available to the audit team.

The audit found that PoMC has a well-developed system for documenting information relating to the CDP that is relevant to confirming compliance with the EMP and the PDSs.

With respect to meeting the 51 requirements relating to the South Channel dredging and mechanisms to protect seagrass, the audit found that:

- » There were 34 requirements for which the audit concluded full compliance was achieved;
- » There were no major, critical or minor non-compliances;
- » There were 17 requirements that were not applicable (typically this was because the requirement pertained to a future activity not current in the audit period or to an item that has been fully assessed in a previous audit and closed out); and
- » There were no requirements for which there was insufficient information available at the time of the audit to reach a conclusion regarding compliance.

Overall the audit concluded that there was full compliance with the audit requirements. A summary of the findings for each mechanism is provided below.

#### ***Location***

The EMP PDS 24 contains requirements for dredging location and depths. The auditor has concluded that dredging completed in South Channel over the audit period has complied with the requirements of this PDS.

#### ***Operational controls***

Three PDSs were applicable to operational controls for the South Channel:

- » EMP PDS 31 – contains requirements for the dredging schedule;
- » EMP PDS 32 – contains requirements for the consideration of environmental limits and;
- » EMP PDS 33 – contains requirements for consideration of seasonal sensitivities within the bay.

The auditor has concluded that controls for the South Channel over the audit period have complied with the requirements of these PDSs.

In addition, the EMP (Annexure 5, turbidity section) and the Turbidity Detailed Design (CDP\_ENV\_MD\_024) have requirements relating to the operational controls of dredging carried out in the South Channel. The auditor has concluded that turbidity monitoring for the South Channel over the audit period has complied with these requirements.

#### ***Monitoring plume intensity and extent***

Requirements in the EMP (Table 7, Plume Intensity and Extent) and the Plume Intensity and Extent Detailed Design (CDP\_ENV\_MD\_021) are applicable to the monitoring of plume intensity and extent for dredging in the South Channel. In particular, there is a requirement to monitor plume intensity and extent at the

commencement of dredging within Project Area 3 (dredging in the south of the bay and disposal and SEDMG).

The auditor has concluded that, over the audit period, monitoring completed in the South Channel has complied with the requirements of the EMP and the Plume Intensity and Extent Detailed Design.

***Monitoring health of seagrass to detect changes outside expected variability***

The EMP (Table 7, Seagrass) and the Seagrass Detailed Design (CDP\_ENV\_MD\_022) contain requirements for monitoring of seagrass to detect changes outside expected variability within South Channel.

The auditor has concluded that, over the audit period, seagrass monitoring has complied with the requirements of the EMP and the Seagrass Detailed Design.

**Recommendations and Opportunities for Improvement**

No recommendations<sup>1</sup> have been made.

One opportunity for improvement<sup>2</sup> was noted:

For light logger data (audit item 43), the auditor notes that the detailed design specifies a service interval for the light meters designed to ensure performance. The auditor found that the requirement for servicing has been met or exceeded (see audit item 46).

There were some gaps in the data due to equipment failure that were not considered to impact the ability of the program to meet its objectives. There is an opportunity for improvement to include in a future milestone report a discussion on why the data collected is adequate. This will document, in a readily available form, that the quality of the data and that its ability to meet the objectives has been considered.

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<sup>1</sup> In the context of this report, "recommendations" refer to recommendations made by the auditor that relate to items of non-compliance and are intended to assist in avoiding future non-compliance. As such, it might be expected that recommendations will be carried out prior to the next audit.

<sup>2</sup> In the context of this report, "opportunities for improvement" are suggestions made by the auditor that relate to areas where full compliance has been achieved and that may offer improvement in management systems and audit program. As such, they are not mandatory.

# 1. Introduction

The Office of the Environmental Monitor (Office) has appointed Dr Peter Nadebaum of GHD Pty Ltd (the Auditor) to undertake a series of independent audits of the implementation of the Environmental Management Plan for the Channel Deepening Project (Project).

This report outlines the findings of one of these audits:

**Activity 2: a detailed analysis of those Project Delivery Standards and monitoring programs relevant to dredging in South Channel and mechanisms to protect seagrass.**

## 1.1 Background

The Office was established by the Victorian Government in December 2007 as a requirement for the Project.

The Office's objectives are to:

- » Be accessible to all stakeholders and the community;
- » Scrutinise, report and advise on the Project's environmental performance in an independent and transparent way; and
- » Communicate all available information on the Project's environmental performance in a meaningful and timely way to stakeholders and the community.

The Channel Deepening Project (CDP) is being implemented by the Port of Melbourne Corporation (PoMC). Its aim is to deepen shipping channels in Port Phillip Bay and the lower reaches of the Yarra River by dredging to enable ships up to 14 m draught to access the Port of Melbourne. Dredging operations commenced in February 2008. The operational stage of the project, which includes dredging and ancillary works, is scheduled for completion in late 2009. Some of the monitoring programs will continue for a further two years.

Victorian and Commonwealth Government environmental approvals for the Project set conditions that the PoMC must adhere to, including arrangements set out in an Environmental Management Plan (EMP), approved ancillary documents covering Turbidity, Underwater Noise and Airborne Noise detailed designs, approved EMP Work Method Statements, and EMP and Environment Protection and Biodiversity Conservation (EPBC) Act approval requirements for independent and external audits. The principal environmental approvals are approvals under Victoria's Coastal Management Act and the Commonwealth's EPBC Act.

The EMP sets out 58 "Project Delivery Standards", which are rules about where, when and how the Project must be delivered. It established four monitoring mechanisms to inform compliance and performance against these standards. It also sets out quarterly, annual and other reporting obligations for the four-year period 2008 to 2012.

This audit is a focussed audit of dredging in South Channel and mechanisms to protect seagrass.

## **1.2 Scope of the Independent audits – Overview**

### **1.2.1 Purpose**

The independent audits form an element of the Project's governance, in terms of environmental assurance mechanisms and provide an independent and transparent assessment for use by the Office. The audit reports will also form part of the public documentation on PoMC's compliance with the EMP and the environmental performance of the Project. Should the need for an investigation emerge from an audit, the Office will consider the audit findings and determine the need, scope and means by which such an investigation would be conducted.

The purposes of the independent audits are:

- » To undertake an audit(s) that meets the provision for the external audit contained in the EMP and which:
  - independently assesses the implementation of the EMP.
  - independently gathers such information necessary to verify the veracity of information arising from the monitoring program commissioned by PoMC – this may include field verification, sampling and measurement.
- » To advise the Office of any non-conformances with the EMP; and
- » To provide regular reports to the Office.

The audit program is divided into two stages, with audit activities as follows:

### **1.2.2 Stage 1: Operational Stage – early 2008 to early 2010**

#### **Activity 1:**

Undertake four (4) independent audits to assess the implementation of the EMP and compliance with each of the 58 Project Delivery Standards (PDSs). It is anticipated that such audits will occur twice annually, with a final audit occurring at completion of the operational stage of the project.

Timing of the audits is to be as follows:

- » 1<sup>st</sup> audit to commence immediately on signing of the contract.
- » 2<sup>nd</sup> audit to be completed by 31 January 2009 (this is to comply with Commonwealth reporting requirements), and will focus on an audit of the PoMC annual report.
- » 3<sup>rd</sup> audit to commence around April/May 2009, but could be subject to change. Timing of this audit to occur within three (3) weeks of the commencement in 2009 of dredging in the South Channel and Port Melbourne Channel.

- » 4<sup>th</sup> audit to commence in late 2009 or early in 2010 based on completion of operational stage of the project. This audit will include auditing of the 58 PDSs and the PoMC annual report.

### **Activity 2:**

Undertake focussed audits of selected EMP requirements relating to significant Project features or processes. Timing of these audits is independent of the Activity 1 audits, but their results should feed into the analysis and assessment of compliance carried out for Activity 1 audits.

These audits are to include a detailed analysis of those Project Delivery Standards and monitoring programs relevant to:

The Entrance:

- » The width and depth of dredging
- » Work methods to reduce rock spill

The management of contaminated sediment:

- » Bund and stub wall construction
- » Methods to remove and place contaminated sediment
- » Placement of sand capping

The South Channel:

- » Mechanisms to protect seagrass

Mechanisms to monitor environmental performance:

- » Environmental monitoring
- » Process monitoring and inspections
- » Management performance monitoring
- » Bay wide monitoring

It is recognised that work carried out for the Activity 2 audits may overlap the work carried out for Activity 1 audits.

This report outlines the findings of an Activity 2 audit that is focussed on dredging in the South Channel and the mechanisms to protect seagrass.

### **1.2.3 Stage 2: Post Operational Phase – early 2010 to early 2012**

A series of independent audits are to be taken in the post operational phase. These are a separately commissioned activity, and will be reported on separately from this series of audits.

## **1.3 Deliverables**

As part of the project the auditor is required to provide:

- » Immediate reports (within 24 h) of any non-conformances that may be identified by the audit;
- » Reports of independent audits of the implementation of the EMP and the 58 Project Delivery Standards;
- » Report on the audit of PoMC's annual report against EMP requirements and Commonwealth project approval conditions; and
- » Reports of focussed audits on selected EMP requirements.

## 1.4 Reference Documents

In addition to Victorian and Commonwealth approvals, the key reference documents for the project are:

- » **Environmental Management Plan**  
<http://www.channelproject.com/environment/management.asp>
- » **EMP Dredging Schedule**  
[http://www.channelproject.com/schedulelocation/dredging\\_schedule.asp](http://www.channelproject.com/schedulelocation/dredging_schedule.asp)
- » **Approved ancillary documents covering Turbidity, Underwater Noise and Airborne Noise detailed designs**  
[http://www.channelproject.com/global/docs/EMON\\_080205\\_Turbidity.pdf](http://www.channelproject.com/global/docs/EMON_080205_Turbidity.pdf)  
[http://www.channelproject.com/global/docs/EMON\\_080205\\_Monitoring\\_Underwater\\_Noise.pdf](http://www.channelproject.com/global/docs/EMON_080205_Monitoring_Underwater_Noise.pdf)  
[http://www.channelproject.com/global/docs/EMON\\_080205\\_Monitoring\\_Airborne\\_Noise.pdf](http://www.channelproject.com/global/docs/EMON_080205_Monitoring_Airborne_Noise.pdf)
- » **Approved ancillary documents covering detailed designs for baywide monitoring programs relevant to this audit**  
[http://www.channelproject.com/global/docs/BMON\\_081107\\_Seagrass.pdf](http://www.channelproject.com/global/docs/BMON_081107_Seagrass.pdf)  
[http://www.channelproject.com/global/docs/BMON\\_081107\\_Plume\\_intensity\\_and\\_extent.pdf](http://www.channelproject.com/global/docs/BMON_081107_Plume_intensity_and_extent.pdf)
- » **Approved EMP Work Method Statements**  
[http://www.channelproject.com/global/docs/WMS\\_080205\\_Material\\_Placement\\_P\\_MDMG.pdf](http://www.channelproject.com/global/docs/WMS_080205_Material_Placement_P_MDMG.pdf)  
[http://www.channelproject.com/global/docs/WMS\\_080205\\_Method\\_Statement\\_EM\\_P\\_Contaminated.pdf](http://www.channelproject.com/global/docs/WMS_080205_Method_Statement_EM_P_Contaminated.pdf)  
[http://www.channelproject.com/global/docs/WMS\\_080205\\_Method\\_Statement\\_EM\\_P\\_Entrance.pdf](http://www.channelproject.com/global/docs/WMS_080205_Method_Statement_EM_P_Entrance.pdf)

It is noted that these documents are subject to periodic review and revisions may be issued during the course of the project.

## 2. The Channel Deepening Project

### 2.1 Project description

#### 2.1.1 Overview

The Channel Deepening Project (CDP) includes:

- » Capital dredging works associated with the channels, swing basins and berth pockets;
- » Management of dredged material; and
- » Modifications to existing infrastructure, including the protection of services, berth upgrades and upgrading and installation of new navigation aids.

The dredging and associated works are expected to take between 18 months to two years to complete.

The CDP components are as follows.

#### 2.1.2 Capital dredging works

The dredging works will be undertaken largely within the existing channels in the north and south of the bay. The exceptions are the turning area at Hovell Pile, which will be enlarged to accommodate larger vessels and the entrances to the Port Melbourne and Great Ship Channels. The middle of the bay (north of Hovell Pile to south of Fawkner Beacon) is naturally deeper and does not require dredging.

#### 2.1.3 Management of dredged material

Dredged material is to be placed within the Port of Melbourne dredged material ground (PoM DMG) located near the middle of the bay, both within the existing area and in a southern extension to it, as well as in a new DMG in the south east of the bay.

All of the dredged material sourced from the Port Melbourne, Williamstown and Yarra River Channels and associated berth pockets will be placed in the PoM DMG. The PoM DMG will be extended to the south to provide capacity for material from future maintenance dredging. Part of the PoM DMG will be bunded and capped with uncontaminated sediments to contain contaminated sediments from the Yarra River and Williamstown and Port Melbourne Channels and berth pockets.

Most of the material dredged from the south of the bay is to be stored in the new south east DMG (SE DMG). Sand dredged from the south of the bay will be used as capping material for the PoM DMG.

#### 2.1.4 Berth works

As a consequence of deepening the shipping channels, a program of structural upgrades to berths is planned at Appleton Dock, Swanson Dock (East and West), Holden Dock and Gellibrand Pier to stabilise the docks beside the deepened channels.

This will ensure the berths will accommodate larger vessels and the lowered riverbed. The swing basins at Swanson Dock and Gellibrand Pier are being enlarged to accommodate turning movements of larger vessels.

### **2.1.5 Services**

Several utility services crossing the Yarra River and Port Phillip Bay are to be protected from shipping movements. The following services are being protected in their current location:

- » The Melbourne Water Hobsons Bay Main Sewer, the Westernport-Altona-Geelong (WAG) oil pipeline, and the GasNet high pressure gas pipeline which all cross the Yarra River downstream of the West Gate Bridge; and
- » The Esso ethane pipeline that crosses Port Phillip Bay south of Fawkner Beacon.

The Telstra telecommunications cables and the CitiPower electrical power cables that currently cross the Yarra River downstream of the West Gate Bridge are being decommissioned and the services rerouted by the respective utility service providers.

### **2.1.6 Navigation Aids**

To ensure ongoing safe navigation of vessels in the deepened shipping channels, some existing navigation aids are being upgraded or replaced and in some locations new navigation aids are being installed. The navigation aids include:

- » New marine-based piled structures for lateral and lead lights adjacent to the northern channels and South Channel; and
- » New land-based lead lights and sector lights at Queenscliff, Port Melbourne and alongside docks within the port.

## **2.2 Environmental Management**

PoMC has a comprehensive program for management of the environmental aspects of the project. Important elements of this include:

- » An Environmental Policy;
- » An Environmental Management System (EMS), consistent with the requirements of *ISO 14001:2004 Environmental management systems – Requirements with guidance for use* developed for the CDP. The EMS consists of the policies, plans, procedures and activities that together form a systematic method of managing the environmental aspects of the project;
- » An Environmental Management Plan (EMP). The EMP is a key component of the EMS and describes the main elements of the EMS and provides direction to detailed procedures and inter-relationships between different processes. The focus of this audit is to determine whether the requirements of the EMP have been complied with.

## **2.3 The Environmental Management Plan**

### **2.3.1 Scope**

The EMP details the environmental management requirements to be followed for the CDP. The EMP includes:

- » Arrangements to integrate the EMP with PoMC's environmental policy and EMS;
- » The requirements for environmental management during the planning, implementation, evaluation and review of CDP construction activities;
- » The responsibilities for implementing the EMP;
- » The Project Delivery Standards (PDS) including environmental controls and limits to ensure that project objectives and targets are achieved;
- » An overview of the environmental monitoring programs and contingency plans and associated management action;
- » Post construction requirements including monitoring and inspections; and
- » The transition arrangements from construction phase to operations.

The EMP generally applies to the works described in Section 2.1 and environmental monitoring programs. PoMC has overall responsibility for the implementation of the CDP in accordance with the requirements of the EMP.

This audit was conducted against the approved EMP. For the period covered by this audit from 8 February 2008 to 10 April 2009, the approved EMPs were as follows:

- » 5 February 2008 EMP (CDP\_IMS\_PL\_004 Revision 1)
- » 11 April 2008 EMP (CDP\_IMS\_PL\_004 Revision 2)
- » 22 July 2008 EMP (CDP\_IMS\_PL\_004 Revision 3)
- » 2 September 2008 EMP (CDP\_IMS\_PL\_004 Revision 4)
- » 3 November 2009 EMP (CDP\_IMS\_PL\_004 Revision 5)
- » 23 January 2009 EMP (CDP\_IMS\_PL\_004 Revision 6)

### **2.3.2 Project Delivery Standards**

PDSs have been identified for the CDP to address key environmental risks, effects and legal requirements. The PDSs are a collation of the management and mitigation measures, environmental performance monitoring and contingency plans for the project. The CDP PDSs relate to:

- » Construction management (all activities);
- » Marine-based works (all areas);
- » Land-based works;
- » Dredging and plume;
- » Dredging schedule;

- » Dredged material management;
- » Entrance dredging;
- » Hydrohammer use and marine-based pile driving.

PDSs generally include 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 (refer to drawing CDP-Env-50228 in Annexure 7 of the EMP for the location of the project areas);
- » 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 – the environmental monitoring programs applicable to the PDS; and
- » Reference to contingencies – the relevant contingency plans containing management actions, which may be taken in the event of potential exceedence of the environmental limit or response level.

It should be noted that the EMP formally defines 8 PDSs, listed above. Within those 8 standards are 58 environmental rules. However, the general convention through the delivery of the CDP has been to refer to the environmental rules individually as PDSs. This convention is continued in these audits and any reference to the 58 PDSs will by definition include the 58 environmental rules.

### **2.3.3 Monitoring Programs**

Three environmental monitoring programs and contingency plans have been developed for the CDP; these are Turbidity, Airborne Noise and Underwater Noise. A further nine baywide monitoring programs, including five sub programs for the fish stock and recruitment program, have been developed. These baywide monitoring programs are designed to provide broader information on the status of key species, habitats and ecological processes in the Port Phillip Bay. These monitoring programs include:

- » Seagrass;
- » Water quality
- » Nutrient cycling
- » Contaminants in fish
- » Algal blooms

- » Little penguins
- » Fish stock and recruitment
  - Sub program 1 Port Phillip Bay trawl
  - Sub program 2a Egg and larval survey
  - Sub program 2b Anchovy study
  - Sub program 3 Recreational fishing
  - Sub program 4 Fish species in seagrass beds
- » Plume intensity and extent
- » Ramsar Wetlands – Key coastal and intertidal vegetation communities.

Each monitoring program has an associated detailed design document, which specifies the objectives, indicators, scope, and reporting frequency for the monitoring program.

## 3. Audit Methodology

### 3.1 Standards

This audit was undertaken adopting a methodology consistent with ISO 19011 to meet the specific requirements of the Office of the Environmental Monitor (the Office) for the audit of PoMC's implementation of the EMP.

ISO 19011 "*Guidelines for Environmental Auditing*" provides a systematic approach to defining the requirements of the audit, planning, interpreting the elements of the EMP, collecting audit evidence, objectively assessing the evidence, and reporting in a clear and accurate manner. It also ensures that the audit has been conducted in accordance with an established and recognised audit methodology.

### 3.2 Audit Preparation

#### 3.2.1 Overview

The audit methodology used in the preparation of this audit is presented schematically in Figure 1. Brief descriptions of key activities are described in greater detail below.

Prior to the audit the Office had identified those elements that it considered were particularly significant, and specified these in the tender brief as requiring focused audits. These are the subject of what are described as Activity 2 audits. This audit report is pertinent to the focussed audit of EMP requirements and monitoring programs relevant to dredging in South Channel and mechanisms to protect seagrass.

#### 3.2.2 Audit Plan and Scope

The requirements of the audit were outlined in a brief that the Office issued for this work (<http://www.oem.vic.gov.au/Independentaudits>), and a draft audit plan and a preliminary methodology for the audit were outlined in the tender submission. To ensure that the audit requirements and the brief were addressed, the scope of the audit was confirmed with the Office and the audit plan and methodology was further refined in subsequent meetings with the Office, Victorian regulators and the Commonwealth.

The audit plan extended to the series of audits that are required under this commission; the methodology outlined in this report is common to all of the audits, but the details of meetings and interviews outlined in the following sections of this report is pertinent to the audit of the requirements of the EMP and the PDSs.

This audit was an Activity 2 audit of dredging in South Channel and mechanisms to protect seagrass. The scope of this audit was to assess the implementation of the EMP and monitoring programs relating to dredging activity in the South Channel to ensure that seagrass in Port Phillip Bay is protected. Four mechanisms have been identified that relate to the control and monitoring of dredging activity, as shown in Table 1.

**Table 1 Mechanisms to control and monitor dredging activity in South Channel**

<b>Control</b>	<b>EMP Requirements</b>
<i>Direct control mechanisms (can provide feedback in hours or minutes)</i>	
1. Location	PDS 24 Toeline and construction zone drawings 35331-4 (excluding elements relating to the Entrance)
2. Operational Controls	PDS 31, 32 and 33 EMP Annexure 5 – Turbidity section Turbidity Detailed Design
<i>Monitoring response mechanisms (provide feedback in days or months)</i>	
3. Monitoring plume intensity and extent	EMP Table 7 – Plume Intensity and Extent Plume Intensity and Extent Detailed Design
4. Monitoring health of seagrass to detect changes outside expected variability	EMP Table 7 – Seagrass Seagrass Detailed Design

Within these four mechanisms, 51 auditable items were identified from within the EMP and detailed designs of relevant monitoring programs.

This audit is based on information available for the audit period from 8 February 2008 to 10 April 2009.

The audit was focused on aspects of the EMP that relate to environmental management and protection of the environment; this audit did not seek to review and confirm compliance with aspects of the PDSs that relate to other aspects such as on-ship or on-shore occupational health and safety, or structural or geotechnical considerations.

In assessing compliance of CDP activities and procedures with requirements of the EMP and the PDSs and monitoring programs, check sheets were prepared by GHD and used to assist in identifying and obtaining evidence relevant to assessing compliance. The audit team met with PoMC nominated environmental representatives and sought relevant evidence; if the evidence requested was deemed by PoMC to be not available or not relevant to the audit at that stage, the auditor sought evidence from PoMC to support that claim.

In general the audit comprised a desk review of documentation provided by POMC and other information available from the Office, Victorian regulators, the Commonwealth and media reports. This review was supported by an inspection by the audit team of the main dredge vessels and berths.

### **3.3 Independence**

In conducting the audit the independence requirements outlined in the Auditor's Declaration of Independence were complied with.

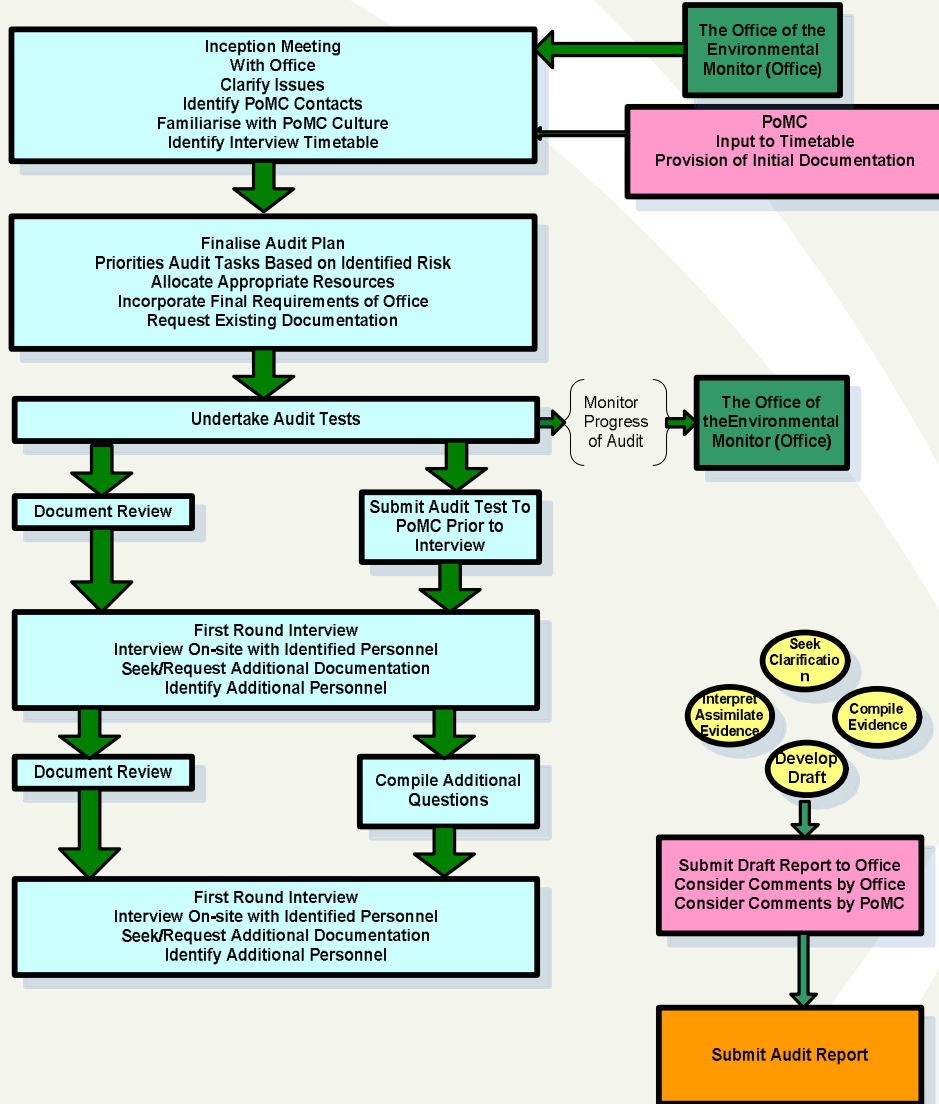
### **3.4 Inception Meetings**

As part of the preparation of the audit plan, the requirements of the brief were reviewed and discussed in a meeting with the Office, Victorian regulators and the Commonwealth on 9 September 2008.

Later the same day a meeting was also held with the Office and PoMC to ascertain the form of the information held by POMC. A comprehensive listing of all elements of the EMP, audit questions and a preliminary set of requirements for evidence were prepared and submitted to the Office and PoMC.

A primary objective of these meetings was for the auditor and audit team to develop working relationships, mutual understandings and expectations with the Office and PoMC relating to the requirements and process of the audit and to provide an opportunity for the PoMC to present an overview of the dredging works, the organisational background, overview of compliance, and to arrange inductions for inspecting the dredge vessels.

**Figure 1 : Summary of Audit Methodology**



## 3.5 Audit Tests and Ranking of Compliance

### 3.5.1 Compliance Grading

The requirements for determining compliance were discussed with the Office, Victorian regulators and the Commonwealth, and it was agreed that compliance would be graded in terms of full compliance, critical non-compliance, major non-compliance, minor non-compliance, not applicable and undetermined. The definition of these terms is outlined in Table 2. This grading was drawn from the method of grading compliance outlined in guidelines to auditors<sup>3</sup> under the Victorian Government *Safe Drinking Water Act 2003*.

**Table 2 Summary Compliance Grades**

<b>Compliance Grade</b>	<b>Description</b>
Full compliance	There is sufficient evidence to confirm that actions have been undertaken, prepared and/or implemented in full compliance with the requirements of the auditable element.
Critical non-compliance	The evidence shows that actions are not in full compliance with the requirements of the auditable element and this gives rise to a serious or imminent risk to the environment.
Major non-compliance	The evidence shows that actions are not in full compliance with the requirements of the auditable element and this gives rise to a high potential that the environment will be seriously affected if the non-compliance is not rectified.
Minor non-compliance	The evidence shows that actions are not in full compliance with the requirements of the auditable element but it is unlikely that this will cause the environment to be seriously affected.
Not applicable	The auditable element falls outside the scope of the audit, eg work relevant to the project delivery standard has not yet commenced.
Undetermined	There is insufficient evidence to make a judgement on compliance.

Audit tests were developed for all requirements within the scope of the audit. These tests were designed to establish compliance with each element of the EMP. Evidence was sought from PoMC to establish whether the element has been complied with.

In order to maximise the efficiency with which the audit was carried out and to ensure the audit effort was directed to the most important issues, an assessment of the risk to the environment associated with each element of the EMP was determined and used to target issues and the level of effort put into each element.

<sup>3</sup> Victorian Government Department of Human Services, Water Regulatory Audit Guidance Note November 2007

### **3.5.2 Variations to audit tests and ranking of compliance**

The criteria listed in Table 2 apply to all 51 audit items within this report. In addition, for audit items 28 – 51, which cover compliance against the relevant requirements of the EMP and the detailed designs for Turbidity, Plume Intensity and Extent, and Seagrass, an auditable element is deemed to be in full compliance provided that:

- a. Monitoring is complete in that all requirements for the auditable element have been completed to the full extent stipulated in the document it is being audited against (such as the detailed design); or
- b. Monitoring is not fully complete but exceptions that have occurred were planned and approved to deliver the program or mechanisms more effectively; or
- c. Monitoring is not fully complete but minor exceptions from requirements of the monitoring program or mechanism have occurred as a consequence of equipment failure/missed measurement or other similar factor, and that will not affect the achievement of the key program objectives and will not cause the environment to be seriously affected.

These additional requirements apply to audit items 28-51 and are consistent with the approach used for audit for Activity No.2, Audit No. 3 (audit of the mechanisms used to monitor environmental performance, GHD March 2009), which determined compliance with the requirements of the CDP environmental monitoring programs and baywide monitoring programs.

### **3.6 Inspection of sites and vessels**

PoMC provided an induction to the auditor and his team on 23 September 2008. The auditor and his team held a land-based inspection of the berths and the dredging vessels, the Queen of the Netherlands and the Cornelius Zanen on 25 and 26 September 2008.

### **3.7 Report on findings**

The findings of the audit are presented in Section 4 of this report. Section 4.1 presents a discussion of the findings as they relate to each of the four mechanisms for control and monitoring of dredging activity in the South Channel. The findings of the report are presented in tabular form for each of the four mechanisms, as listed in Table 1.

Note that the listing and findings are not presented in a “prioritised order” or “order of significance”. Reference numbers assigned to audit requirements are arbitrary sequential numbers and do not refer to sections in the EMP or other CDP documents.

## 4. Audit Findings

### 4.1 Summary of Findings

#### 4.1.1 Overview

The audit found that PoMC has a well-developed system for documenting information relating to the CDP that is relevant to confirming compliance with the EMP and the PDSs.

With respect to meeting the 51 requirements relating to the south Channel dredging and mechanisms to protect seagrass, the audit found that:

- » There were 34 requirements for which the audit concluded full compliance was achieved;
- » There were no major, critical or minor non-compliances;
- »
- » There were 17 requirements that were not applicable (typically this was because the requirement pertained to a future activity not current in the audit period or to an item that has been fully assessed in a previous audit and closed out); and
- » There were no requirements for which there was insufficient information available at the time of the audit to reach a conclusion regarding compliance.

Overall the audit concluded that there was full compliance with the audit requirements. A summary of the findings for each mechanism is provided below.

#### 4.1.2 Location

The EMP PDS 24 contains requirements for dredging location and depths. The auditor has concluded that dredging completed in South Channel over the audit period has complied with the requirements of this PDS.

#### 4.1.3 Operational controls

Three PDSs were applicable to operation controls for the South Channel:

- » EMP PDS 31 – contains requirements for the dredging schedule;
- » EMP PDS 32 – contains requirements for the consideration of environmental limits and;
- » EMP PDS 33 – contains requirements for consideration of seasonal sensitivities within the bay.

The auditor has concluded that controls for the South Channel over the audit period have complied with the requirements of these PDSs.

In addition, the EMP (Annexure 5, turbidity section) and the Turbidity Detailed Design (CDP\_ENV\_MD\_024) have requirements relating to the operational controls of dredging carried out in the South Channel. The auditor has concluded that turbidity

monitoring for the South Channel over the audit period has complied with these requirements.

#### **4.1.4 Monitoring plume intensity and extent**

Requirements in the EMP (Table 7, Plume Intensity and Extent) and the Plume Intensity and Extent Detailed Design (CDP\_ENV\_MD\_021) are applicable to the monitoring of plume intensity and extent for dredging in the South Channel. In particular, there is a requirement to monitor plume intensity and extent at the commencement of dredging within Project Area 3 (dredging in the south of the bay and disposal and SEDMG).

The auditor has concluded that, over the audit period, monitoring completed in the South Channel has complied with the requirements of the EMP and the Plume Intensity and Extent Detailed Design.

#### **4.1.5 Monitoring health of seagrass to detect changes outside expected variability**

The EMP (Table 7, Seagrass) and the Seagrass Detailed Design (CDP\_ENV\_MD\_022) have requirements applicable to the monitoring of seagrass to detect changes outside expected variability within South Channel.

The auditor has concluded that, over the audit period, seagrass monitoring has complied with the requirements of the EMP and the Seagrass Detailed Design.

## **4.2 Recommendations and Opportunities for Improvement**

No recommendations<sup>4</sup> have been made.

One opportunity for improvement<sup>5</sup> was noted:

For light logger data (audit item 43), the auditor notes that the detailed design specifies a service interval for the light meters designed to ensure performance. The auditor found that the requirement for servicing has been met or exceeded (see audit item 46).

There were some gaps in the data due to equipment failure that were not considered to impact the ability of the program to meet its objectives. There is an opportunity for improvement to include in a future milestone report a discussion on why the data collected is adequate. This will document, in a readily available form, that the quality of the data and that its ability to meet the objectives has been considered.

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<sup>4</sup> In the context of this report, "recommendations" refer to recommendations made by the auditor that relate to items of non-compliance and are intended to assist in avoiding future non-compliance. As such, it might be expected that recommendations will be carried out prior to the next audit.

<sup>5</sup> In the context of this report, "opportunities for improvement" are suggestions made by the auditor that relate to areas where full compliance has been achieved and that may offer improvement in management systems and audit program. As such, they are not mandatory.

### **4.3 Acknowledgement**

The auditor wishes to acknowledge that PoMC responded to the many requests by the audit team for information and evidence, and a large body of information was made available to the audit team for the purposes of the audit.

### **4.4 Details of Compliance**

Details pertaining to the requirements, evidence and compliance for each of the audit requirements are provided in Table 3 to Table 6.

**Table 3 Requirements relating to dredging location**

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence										
<b>PDS 24 - DREDGING</b>														
1	<p>Design depths are to be achieved as a minimum in all areas. Due to dredging tolerance, actual construction depth will exceed design depths. Design depths are as follows:</p> <table border="1"> <thead> <tr> <th></th> <th>Great Ship Channel / layby</th> <th>Sth Channel (fairway / channel / Hovell Pile)</th> <th>Port Mel &amp; W'town Channels</th> <th>Yarra River Channel</th> </tr> </thead> <tbody> <tr> <td>Design depth (m)</td> <td>17.3 / 14.3</td> <td>16.8 / 15.8 / 16.3</td> <td>15.8</td> <td>16.1 / 15.8 / 15.25</td> </tr> </tbody> </table>		Great Ship Channel / layby	Sth Channel (fairway / channel / Hovell Pile)	Port Mel & W'town Channels	Yarra River Channel	Design depth (m)	17.3 / 14.3	16.8 / 15.8 / 16.3	15.8	16.1 / 15.8 / 15.25	Dredging in South Channel had not yet been completed on 10 April 2009 and hence compliance with the design depth requirements cannot be assessed. Compliance against this requirement will be assessed in future Activity 1 audits.	Not applicable	Alliance Monthly Report April 2009 (CDP_ALL_REP_303-09-04)
	Great Ship Channel / layby	Sth Channel (fairway / channel / Hovell Pile)	Port Mel & W'town Channels	Yarra River Channel										
Design depth (m)	17.3 / 14.3	16.8 / 15.8 / 16.3	15.8	16.1 / 15.8 / 15.25										
2	<p>Dredging must remain within the maximum total insitu volume, width constraints and construction depth constraints identified below:</p> <ul style="list-style-type: none"> <li>» Maximum total insitu volume to be dredged is 22.92 million m<sup>3</sup> ± 15%;</li> </ul>	This item relates to the overall CDP dredged volume and is not specific to South Channel. As dredging is still ongoing as of 10 April 2009, this item is not yet applicable. Compliance against this requirement will be assessed in future Activity 1 audits.	Not applicable	Alliance Monthly Report April 2009 (CDP_ALL_REP_303-09-04)										
3	<ul style="list-style-type: none"> <li>» Maximum insitu volume to be dredged in the Entrance is 0.55 million m<sup>3</sup> ± 15%; and</li> </ul>	This item is not applicable to dredging in South Channel.	Not applicable											
4	<ul style="list-style-type: none"> <li>» Maximum insitu volume of contaminated sediments (soft silts) to be dredged is 1.72 million m<sup>3</sup> ± 15% (dredging volume to be finalised following pre-construction bathymetry survey), and</li> </ul>	This item is not applicable to dredging in South Channel.	Not applicable											
5	<ul style="list-style-type: none"> <li>» A minimum of 50% of the area to be dredged and within toe lines is to be within 0.9 m of the design</li> </ul>	Dredging in South Channel had not yet been completed on 10 April 2009 and hence final compliance with the design depth requirements	Full	Alliance Monthly Report April 2009 (CDP_ALL_REP_303-										

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
	depth (sands and clays) and within 1.3 m of the design depth (Entrance). This does not apply to the sand waves within South Channel;	cannot be assessed. The Alliance Monthly Report April 2009 indicates that over 50 % of the area to be dredged in South Channel is within 0.9 m of design depth and hence the auditor considers this requirement is being complied with.	compliance	09-04)
6	» A minimum of 90% of the area to be dredged and within toe lines is to be within 1.8m of the design depth (19.1 m total depth) as determined following completion of dredging (Entrance only); and	This item is not applicable to dredging in South Channel.	Not applicable	
7	» For areas to be dredged, final channel width to be no greater than 25 m outside of the Williamstown Channel, Port Melbourne Channel, and South Channel design toe lines and 15 m of the Entrance design toe line. 50% of the delivered toe line is to be within 15 m of the Williamstown Channel, Port Melbourne Channel, and South Channel design toe lines and 9 m of the Entrance design toe line. This does not apply to the sand waves within South Channel, and the north-west side of Nepean Bank (where the minimum amount to achieve a design depth of 17.3 m is to be dredged).	Requirements for Williamstown Channel, Port Melbourne Channel and the Entrance are not applicable to this audit. Compliance has only been assessed for requirements relating to South Channel.  Dredging in South Channel had not yet been completed on 10 April 2009 and hence compliance with final channel width requirements cannot be assessed. The Alliance Monthly Report April 2009 indicates that 100 % of the delivered toeline in South Channel is currently within 15 m of the design toeline and hence the auditor considers this requirement is being complied with.	Full compliance	Alliance Monthly Report April 2009 (CDP_ALL_REP_303-09-04)
8	Construction zone – construction zones have been identified to limit the footprint of dredging activities. Construction areas are identified in drawings listed below.	The EMP Annexure 7 drawings 35331, 35332, 35333 and 35334 outline the construction zones to limit the footprint of dredging activities in South Channel.	For information only	EMP Annexure 7 drawings 35331, 35332, 35333 and 35334
9	All dredging activities to take place within the construction zones. No dredging (as a subset of dredging activities) is to take place within 65 m of the outside edge of the construction zone (Port Melbourne Channel, South Channel and the Entrance only, except to the extent necessary to achieve a design depth of 17.3 m along the north-west side of Nepean Bank). This is to be confirmed through draghead tracking (in dredging mode only) and validated by bathymetry survey (where draghead tracking indicates that dredging in this area has potentially occurred).	Dredge requirements for the Port Melbourne Channel and the Entrance are not applicable to this audit. Compliance has only been assessed for requirements relating to South Channel.  Alliance reporting has not identified cases where dredging took place outside the construction zones during the audit period.  In seeking to confirm that the requirement has been met, the auditor completed a review of vessel tracking data for the Queen of the Netherlands (8 to 14 February 2008 and 16 to 22 September 2008), Cornelis Zanen (24 to 30 June 2008) and the Prins der Nederlanden (1 to 8 April 2009). Review of this data confirmed that on these dates no dredging occurred within 65 m of the outside edge of the construction	Full compliance	Vessel tracking data for the Queen of the Netherlands (8 to 14 February 2008 and 16 to 22 September 2008), Cornelis Zanen (24 to 30 June 2008) and the Prins der Nederlanden (1 to 8 April 2009)

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
		<p>zone.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>		
10	<p>Dredging equipment and associated support vessels will be required to manoeuvre outside construction areas, including transit between construction areas.</p>	<p>Dredge requirements for the Port Melbourne Channel and the Entrance are not applicable to this audit. Compliance has only been assessed for requirements relating to South Channel.</p> <p>Demonstration of vessel tracking by the Alliance indicated movement outside of construction zones, including sailing to and from DMGs, bunkering, anchoring or moving out of shipping channels to allow other vessels to pass.</p> <p>Review of vessel tracking data provided for the Queen of the Netherlands, Cornelis Zanen and Prins der Nederlanden for the dates in the previous point confirms that dredging equipment and associated support vessels were manoeuvred outside construction areas, as was anticipated in this PDS.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	<p>Alliance demonstration of the tracking data on EnviroSys Database (8 October 2008 at Alliance office, Fishermans Wharf)</p> <p>Vessel tracking data for the Queen of the Netherlands (8 to 14 February 2008 and 16 to 22 September 2008), Cornelis Zanen (24 to 30 June 2008) and the Prins der Nederlanden (1 to 8 April 2009)</p>
11	<p>Toe lines and construction zones are identified on:</p> <ul style="list-style-type: none"> <li>» Drawing 35328 – Channel Deepening Project – Port of Melbourne – Coastal Management Consent Scope of Works;</li> <li>» Drawing 35329 – Channel Deepening Project – Port of Melbourne – South – Coastal Management Consent Scope of Works;</li> <li>» Drawing 35330 – Channel Deepening Project – Port of Melbourne – North – Coastal Management Consent Scope of Works;</li> <li>» Drawing 35331 – Channel Deepening Project – Port Phillip Entrance – South Channel – Coastal Management Consent Scope of Works;</li> <li>» Drawing 35332 – Channel Deepening Project – Port Phillip Entrance – South Channel – Coastal</li> </ul>	<p>Dredge requirements for the Port Melbourne Channel and the Entrance are not applicable to this audit. Compliance has only been assessed for requirements relating to South Channel.</p> <p>The EMP Annexure 7 drawings 35331, 35332, 35333 and 35334 outline the construction zones to limit the footprint of dredging activities in South Channel.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	<p>EMP Annexure 7 drawings 35331, 35332, 35333 and 35334</p>

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence																				
	Management Consent Scope of Works; <ul style="list-style-type: none"> <li>» Drawing 35333 – Channel Deepening Project – South Channel – West - Coastal Management Consent Scope of Works;</li> <li>» Drawing 35334 – Channel Deepening Project – South Channel – East - Coastal Management Consent Scope of Works;</li> <li>» Drawing CDP-ENV-50254 – Construction Areas – Heritage significance.</li> </ul> (Drawings are included in Annexure 7)																							
12	Dredging to be undertaken in accordance with EMP Method Statement for Dredging works North – Contaminated (CDP_ALL_MS_408).	This item is not applicable to dredging in the South Channel.	Not applicable																					
13	Tracking of equipment activity as follows: <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th>Equipment</th> <th>Time</th> <th>Date</th> <th>Co-ordinates</th> <th>Other</th> </tr> </thead> <tbody> <tr> <td>TSHD</td> <td>P</td> <td>P</td> <td>Dredging - x,y,z (northing, easting, depth to Chart Datum)  Sailing &amp; placement of dredged material – x,y,z (northing, easting)</td> <td>Status of cycle (i.e. dredging, sailing, placement of dredged material)</td> </tr> <tr> <td>Backhoe Dredge &amp; Grab Dredge (contam material only)</td> <td>P</td> <td>P</td> <td>x,y,z bucket (northing, easting, depth to Chart Datum)</td> <td>Nil</td> </tr> <tr> <td>Split hopper barges</td> <td>P</td> <td>P</td> <td>x,y (northing, easting)</td> <td>Nil</td> </tr> </tbody> </table>	Equipment	Time	Date	Co-ordinates	Other	TSHD	P	P	Dredging - x,y,z (northing, easting, depth to Chart Datum)  Sailing & placement of dredged material – x,y,z (northing, easting)	Status of cycle (i.e. dredging, sailing, placement of dredged material)	Backhoe Dredge & Grab Dredge (contam material only)	P	P	x,y,z bucket (northing, easting, depth to Chart Datum)	Nil	Split hopper barges	P	P	x,y (northing, easting)	Nil	<p>Review of tracking data provided by the Alliance, from a selection of dates chosen by the auditor, indicates the TSHDs have been tracked in accordance with the requirements. This review confirmed that an automated data collection system is in place whereby the equipment activity is tracked and recorded every thirty seconds. Equipment is indicated by the name of the vessel.</p> <p>Evidence of the tracking extent was also confirmed during the Alliance's EnviroSys demonstration to GHD on 8 October 2008 where all equipment was tracked.</p> <p>Onboard inspection of the Queen of the Netherlands on 25 September 2008 and the Cornelis Zanen on 26 September 2008, under instruction of the Vessel Master (Alliance), included an overview of tracking instruments and details. All tracking of equipment activity for the TSHDs was indicated.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	<p>Alliance demonstration of the tracking data on EnviroSys Database (8 October 2008 at Alliance office, Fishermans Wharf)</p> <p>Onboard inspection of the Queen of the Netherlands (25 September 2008) and the Cornelis Zanen (26 September 2008)</p> <p>Vessel tracking data for the Queen of the Netherlands (8 to 14 February 2008 and 16 to 22 September 2008), Cornelis Zanen (24 to 30 June 2008) and the Prins der Nederlanden (1 to 8 April 2009)</p>
Equipment	Time	Date	Co-ordinates	Other																				
TSHD	P	P	Dredging - x,y,z (northing, easting, depth to Chart Datum)  Sailing & placement of dredged material – x,y,z (northing, easting)	Status of cycle (i.e. dredging, sailing, placement of dredged material)																				
Backhoe Dredge & Grab Dredge (contam material only)	P	P	x,y,z bucket (northing, easting, depth to Chart Datum)	Nil																				
Split hopper barges	P	P	x,y (northing, easting)	Nil																				

Item	Requirement					Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
	Spreader pontoon	P	P	x,y (northing, easting)	Nil			
	Diffuser pontoon	P	P	x,y,z (northing, easting depth to Chart Datum)	Nil			
14	Use of green valve at all times when using overflow.					<p>The Vessel Master confirmed, during an onboard inspection of the Queen of the Netherlands on 25 September 2008 and the Cornelis Zanen on 26 September 2008, that the green valve is automated for use when the overflow is used.</p> <p>Review of the daily trip reports for the Queen of the Netherlands (8 to 14 February 2008 and 16 to 22 September 2008), Cornelis Zanen (24 to 30 June 2008) and the Prins der Nederlanden (1 to 8 April 2009) indicated that the green valve was operational.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	<p>Onboard inspection of the Queen of the Netherlands (25 September 2008) and the Cornelis Zanen (26 September 2008)</p> <p>Daily trip reports for the Queen of the Netherlands (8 to 14 February 2008 and 16 to 22 September 2008), Cornelis Zanen (24 to 30 June 2008) and the Prins der Nederlanden (1 to 8 April 2009)</p>
15	The overflow valve of the TSHD will be closed when sailing.					<p>PoMC has advised that the overflow valve of the TSHD is always closed while sailing. Review of the daily trip reports for the Queen of the Netherlands (8 to 14 February 2008 and 16 to 22 September 2008), Cornelis Zanen (24 to 30 June 2008) and the Prins der Nederlanden (1 to 8 April 2009) indicated that the overflow valve was closed during sailing. This was evidenced by a row on each report under the miscellaneous heading: "Turbidity during sailing (O/C)". In all cases this corresponded with "C" in each trip column, thus indicating that the valve was closed.</p> <p>Both Vessel Master were interviewed by GHD (Queen of the Netherlands on 25 September 2008 and Cornelis Zanen on 26 September 2008) and also confirmed that the overflow valve is closed while sailing.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	<p>Daily trip reports for the Queen of the Netherlands (8 to 14 February 2008 and 16 to 22 September 2008), Cornelis Zanen (24 to 30 June 2008) and the Prins der Nederlanden (1 to 8 April 2009)</p> <p>Onboard inspection of the Queen of the Netherlands (25 September 2008) and the Cornelis Zanen (26 September 2008)</p>

**Table 4 Requirements for operational controls**

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
<b>PDS 31 – DREDGING SCHEDULE</b>				
16	The initial dredging schedule to be submitted to DSE before implementation.	The Channel Deepening Project Independent Audit – Activity 1 Audit 1 found that compliance had been achieved with this requirement.	Full compliance	GHD 2008, Channel Deepening Project Independent Audit – Activity 1 Audit 1 for the Office of the Environmental Monitor, December 2008
17	Subsequent revisions of the dredging schedule and monthly updates will be submitted to DSE within 2 working days of approval by CDP management.	Review of the Dredge Schedules, PoMC Matter for Decision documents as well as Notification to Agencies letters and email records indicates that subsequent revisions of the dredging schedule and monthly updates were submitted to DSE within 2 days of approval by CDP management. Approval by CDP management can be seen in the form of signatures on the Matter for Decision documents and as a name in the “approved” column on revisions of the EMP Dredge Schedules. All dates in Notification to Agency letters and emails correspondence were within 2 working days of approval dates by CDP management.  The auditor concludes that compliance has been achieved with this requirement.	Full compliance	EMP Dredging Schedules (All revisions and updates up to 10 April 2009).  Matter for Decision (documents from January 2008 to 10 April 2009).  Notification to Agencies letters and email records (to various DSE contacts up to 10 April 2009).
18	Dredging to take place as summarised in Table 16 ‘Dredging Summary’.	The EMP Table 16 ‘Dredging Summary’ contains requirements for ‘indicative dredging technology’, ‘indicative dredging volumes’, ‘material description’, ‘dredged material ground’, ‘management requirements’ and ‘disposal method’ for the South Channel.  Review of the dredging schedule indicates that all dredging in South Channel has been conducted using either a jumbo TSHD (Queen of the Netherlands) or a mid-sized TSHD (Cornelis Zanen or Prins der Nederlanden) and hence complies with the requirements summarised in Table 16.  Dredging in South Channel is currently ongoing and hence compliance with the ‘indicative dredging volumes’ cannot be assessed at this time. The volume dredged by 10 April 2009 in South Channel is less than 14.59 million m <sup>3</sup> .  Review of vessel daily trip reports indicates that the materials dredged are sand and	Full compliance	Dredge Schedule Revision 2 Update 2  Alliance Monthly Report April 2009 (CDP_ALL_REP_303-09-04)  Daily trip reports for the Queen of the Netherlands (8 to 14 February 2008 and 16 to 22 September 2008), Cornelis Zanen (24 to 30 June 2008) and the Prins der Nederlanden (1 to 8 April 2009)

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
		<p>clay, which corresponds with the material description in Table 16.</p> <p>Review of vessel daily trip reports for the Queen of the Netherlands (8 to 14 February 2008 and 16 to 22 September 2008), Cornelis Zanen (24 to 30 June 2008) and the Prins der Nederlanden (1 to 8 April 2009) indicates that material dredged from South Channel has been disposed to both PoM DMG and SE DMG. This is in accordance with the requirements listed in Table 16. Use of sand for cleaning of the hopper, bund construction and capping of PoM DMG will be assessed in detail in the focussed audits of management of contaminated sediments – bund construction and management of contaminated sediments – sand capping.</p> <p>Application of sand for capping of the DMG using a spreader has not yet occurred and will be assessed in detail in the focussed audit for management of contaminated sediments – sand capping.</p> <p>Based on the information available at 10 April 2009, the auditor concludes that dredging in South Channel has complied with the requirements in Table 16 of the EMP.</p>		
19	<p>Dredging schedule to include:</p> <ul style="list-style-type: none"> <li>» dredging technology.</li> <li>» dredging configuration (i.e. number and location of dredges, use of interval dredging).</li> <li>» timing, duration and sequence of dredging in Project Areas.</li> </ul>	<p>Review of revisions of the EMP Dredging Schedule indicates that the revisions of the schedules include dredging technology, dredging configuration, timing, duration and sequence of dredging in the project areas.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	All revisions of EMP Dredging Schedules (All revisions and updates up to 10 April 2008).
20	Capping layer to be placed around 140 days after completion of the hydraulic placement of contaminated sediment to allow the sediment sufficient time to gain enough strength to support the capping layer.	This item is not applicable to dredging in South Channel.	Not applicable	
21	Capping will be completed before 31 December 2009.	This item is not applicable to dredging in South Channel.	Not applicable	

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
<b>PDS 32 – CONSIDERATION OF ENVIRONMENTAL LIMITS</b>				
22	Revisions to the dredging schedule will be assessed to confirm ability to comply with airborne noise and turbidity environmental limits.	Review of the Matter for Decision documents for revisions and updates to the dredging schedule confirms that all revisions to 10 April 2009 have been assessed to confirm ability to comply with airborne noise and turbidity environmental limits.  The auditor concludes that compliance has been achieved with this requirement.	Full compliance	EMP Dredging Schedules (All revisions and updates up to 10 April 2009).  Matter for Decision (documents from January 2008 to 10 April 2009)
<b>PDS 33 – CONSIDERATION OF SEASONAL SENSITIVITIES</b>				
23	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.	Review of the Dredging Schedule Revision 2 Update 4 indicates that no dredging occurred between 18 December 2008 and 31 January 2009. This was also confirmed by the following PoMC media releases:  » <i>Dredging vessels to leave Melbourne for reconstruction and routine maintenance</i> , PoMC, 15 October 2008  » <i>Port moves to complete Port Phillip Bay channel deepening early</i> , PoMC, 22 December 2008  » <i>Port welcomes back 'new-look' Queen of the Netherlands</i> , PoMC, 7 April 2009  These media releases indicate that none of the three TSHDs were dredging in the south of Port Phillip Bay during the period 18 December 2008 to 3 January 2009.  The auditor concludes that full compliance has been achieved with this requirement.	Full compliance	Dredging Schedule Update 2 Revision 4  <i>Dredging vessels to leave Melbourne for reconstruction and routine maintenance</i> , Port of Melbourne Corporation, 15 October 2008  <i>Port moves to complete Port Phillip Bay channel deepening early</i> , PoMC, 22 December 2008  <i>Port welcomes back 'new-look' Queen of the Netherlands</i> , PoMC, 7 April 2009
24	Restrict dredging in Williamstown Channel (within Hobsons Bay) to less than 50% of key anchovy spawning period from 1 December to 28 February. A two weeks on/two week off sequence will be applied to this period.	This item is not applicable to dredging in South Channel.	Not applicable	
25	No dredging using the TSHD in the Yarra River or Williamstown Channels	This item is not applicable to dredging in South Channel.	Not applicable	

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
	between 15 October to 30 November to protect migration of the endangered Australian grayling species (relates to EPBC Act / NES matters – refer to Annexure 8).			
26	Dredging using the TSHD in Yarra River between 1 April and 31 July restricted to no more than two calendar months, or equivalent in days to protect Australian grayling larval drift.	This item is not applicable to dredging in South Channel.	Not applicable	
27	In preparing the dredging schedule, consideration will be given to seasonal sensitivities and preferred seasons identified in Table 17 'Key Seasonal Sensitivities and Preferred Seasons'. The decision process, including how seasonal sensitivities were considered, will be documented.	<p>The revisions and updates of the EMP Dredging Schedule and PoMC Matter for Decision documents up to 10 April 2009 provide information that indicates that in preparing the dredge schedule, consideration was given to seasonal sensitivities and preferred seasons as identified in EMP Table 17 'Key Seasonal Sensitivities and Preferred Seasons'.</p> <p>The EMP Dredge Schedule includes information on <i>"Dredging Constraints"</i> in the section dealing with the time schedule. A table and legend entitled <i>"Environmental and Social Preferences"</i> is also presented, indicating preferred dredging periods in each area and any non-dredging or dredging restricted periods (as indicated in the first 4 dot points of this PDS). The Schedule also notes that <i>"Environmental limits and seasonal sensitivities have been considered during the development of the EMP Dredging Schedule"</i>.</p> <p>The information provided indicates that consideration was also given to seasonal activities for changes in the dredging schedule. Documentation is included in document series of <i>Matter for Decision</i>. Matter for Decision documents include a Table indicating the <i>"Status of EMP Dredging Schedule"</i> against the <i>"EMP Requirements"</i> as well as continually updated schedule changes to reflect EMP Table 17 requirements.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	<p>EMP Table 17</p> <p>EMP Dredging Schedules (All revisions and updates up to 10 April 2009).</p> <p>Matter for Decision (documents from January 2008 to 10 April 2009)</p>

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
<b>TURBIDITY DETAILED DESIGN</b>				
28	Undertake continuous turbidity monitoring at 'conformance locations' in the south of Port Phillip Bay (Figure 12 and Table 23 of the CDP EMP, REV 5) for the sites with environmental limits set for the protection of seagrass in the south of the bay (Section 7.1, Turbidity Detailed Design). This includes: Sorrento Bay (2006), Swan Bay- Coles Channel (2413), Mud Island East C (2506), Camerons Bight (2601), Rye Jetty (2602) and Lonsdale Bight North (1308).	<p>Continuous turbidity monitoring has been undertaken as required at the conformance locations for the protection of seagrass. The audit team has reviewed weekly turbidity monitoring results, published on the CDP website, which show data for 2 hourly EWHA and/or 6 hourly EWHA based results. Some exceptions to continuous monitoring at conformance locations had occurred and were reported in quarterly project progress reports (PoMC 2008, 2009). Checks by the auditor did not identify data losses other than those reported. Exceptions reported in quarterly project progress reports were:</p> <ul style="list-style-type: none"> <li>» Failure of turbidity loggers at conformance locations occurred in five separate months at turbidity sites for the projection of seagrass between March 2008 and November 4 2008. These losses were reported as part of the audit undertaken of the mechanisms used to monitor environmental performance (GHD 2009), where it was concluded that these data losses were insignificant and full compliance was assigned for this requirement.</li> <li>» Between 5 November and 10 April 2009, data losses at conformance locations in the south of the bay occurred in November (three six-hour EWMA for 2601 on 24 and 25) and February (loss of three six-hour EWMA for 2602 on 16 and 17 February). There was no evidence of other data losses for the remainder of the audit period.</li> </ul> <p>Minutes of the 6-monthly review for environmental performance held in November 2008 (PoMC 2008) states that the PoMC has calculated data recovery rates to be approximately 99%. The minutes also stated that data losses were considered to be insignificant and that the review attendees were presented with evidence of overall compliance with the requirements of the turbidity detailed design (TDD).</p> <p>Quarterly Project Progress Report No. 4 (PoMC 2009) states that data recovery rates remained high from 1 November to 31 January 2009 at 99.8%. Written confirmation (file note, PoMC 2008) has been supplied that states that during the reporting period of February-April 2009, 99.9% of turbidity buoy data was successfully captured across Port Phillip Bay. The management review for environmental monitoring held on the 11<sup>th</sup> May 2009 noted there were no specific matters of concern identified for the turbidity-monitoring program that required discussion.</p> <p>The auditor notes that a large body of data has been generated since project commencement (at each site, a reading is collected every 12 seconds and a median</p>	Full compliance	<p>PoMC Quarterly Project Report No.1, No.2, No.3 and No.4 (2008 and 2009).</p> <p>Archived weekly turbidity monitoring results  <a href="http://www.channelproject.com.au/publications/archive/turbidity_index.asp">http://www.channelproject.com.au/publications/archive/turbidity_index.asp</a></p> <p>PoMC (2008) Record of Minutes for the CDP Management Review for Environmental Monitoring, 11<sup>th</sup> November 2008.</p> <p>PoMC (2009) Record of Minutes for the CDP Management Review for Environmental Monitoring, 11<sup>th</sup> May 2009.</p> <p>PoMC (2009) File note stating that the capture of turbidity data for Feb to Apr 2009 was 99.9%.</p> <p>GHD 2009, Channel Deepening Project Independent Audit – Activity 2 Audit 3 for the Office of the Environmental Monitor, March 2009, page 33.</p>

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
		<p>reading is calculated from every 5 readings each minute), and for the purposes of this audit the weekly turbidity reports, which summarise this information have been used to verify that monitoring has been undertaken at each site.</p> <p>The auditor concludes that the turbidity monitoring has been undertaken continuously, data losses at conformance locations are inconsequential and should not affect the ability of the turbidity program to meet its objectives in relation to monitoring impacts on seagrass within the south channel.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>		
29	<p>Review light monitoring data from PAR sensors located at turbidity sites 2506, 2601 and 2006 to check turbidity environmental limits against the ecological objectives of the environmental limits. This is to occur monthly for the first year or bulk dredging in the South Channel (Section 7.3, Turbidity Detailed Design, REV_3).</p>	<p>Bulk dredging in the South Channel began on 16 September 2008 (PoMC, March 2009). Monitoring of light at the three sites (2506, 2601 and 2006) began 18 August 2008 (Notice to Mariners 22 August 2008).</p> <p>Documents that detail the monthly review of light monitoring data from PAR sensors were obtained for September 2008 to April 2009 were reviewed by the auditor. These documents showed graphs of light transmission assessed against the environmental objective that turbidity should provide no less than 15% of light transmission to a depth of three metres for 50% of the time for a 14-day period (Emphron 2009).</p> <p>Two reports that show that the accuracy between light attenuation and increased suspended sediments have been tested using the data continuously collected from the three sites between August 2008 and March 2009 (Emphron 2009a and 2009b) were also sighted by the auditor.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	<p>Notice to Mariners, August 2008 and email from professional diving services confirming the installation of light monitoring sensors, sent 22 August 2008.</p> <p>Emphron (2009a) Channel Deepening Project Light Monitoring Programme – Turbidity and Kd Relationships</p> <p>Emphron (2009b) Review of Kd and Turbidity Relationships at Camerons Bight, Mud Island and Sorrento Bank, 1 January 2009 to 24 March 2009.</p> <p>Monthly Review of Light Data – September 2008 to April 2009 (eight separate monthly reports).</p>
30	<p>Authorities listed in Table 6 of the EMP (Revision 6) to be notified within 1 working day (normal business hours) of verification that calculation of a 6 hour EWMA for a turbidity conformance location has not occurred (for those locations relevant to the South Channel as detailed in the audit item above).</p>	<p>The EMP specifies that for a loss of the calculation for a 6 hourly EWMA for a turbidity conformance location, the relevant authorities must be notified within 1 working day of the event. This became a formal requirement of the EMP from Revision 5 onwards (3 November 2008).</p> <p>There were three disruptions of turbidity loggers during the time that there was a formal requirement within the EMP to report. Turbidity logger 2006 failed on 4 November 2008, 2601 failed on 24 and 25 November 2008, and 2602 failed on 16 and 17 February 2009. The auditor has sighted emails reporting the disruptions to the relevant authorities as required by the EMP (reported on the first working day</p>	Full compliance	<p>OEM (2008) Quarterly Project Review No. 3, Table 5. December 2008.</p> <p>Emails sent by PoMC to relevant authorities as notification of disruption of turbidity loggers – 5/11/2008, 26/11/2009, 17/02/2009.</p>

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
	This requirement is applicable from Revision 5 of the EMP, 3 November 2008.	after verifying that the EWMA calculation has not occurred).  The auditor concludes that compliance has been achieved with this audit requirement.		
31	In the event of an exceedence of response levels (Section 6.2 of the Turbidity Detailed Design) or environmental limits (Table 23 in the CDP EMP, REV_6), notify the required government agencies within the time required by the CDP EMP (Table 6, REV_6), including: <ol style="list-style-type: none"> <li>Response level reached: notification within 1 working day (normal business hours); and</li> <li>Environmental limit: within 12 hours (any time of day) of verifying that the environmental limit has been exceeded.</li> </ol>	Four exceedences of response level 1 occurred up to 16 November 2008, none of which were for monitoring sites for the protection of seagrass in the south of the bay (as listed for audit item 28 above). Compliance with this requirement up to 16 November is discussed as part of the audit undertaken for the mechanisms used to monitor environmental performance (GHD 2009).  The information provided showed that between 16 November 2008 and 10 April 2009 an exceedence of response level 1 and 2 occurred at 7005 and the environmental limit was exceeded at 8016, all in late November 2008 due to storm activity. These sites are not within the south of the bay. Response level 2 was also exceeded (two 6-hour EWMA's) at 2948 on 4 March 2009. 2948 is located in the south of the bay, but is not intended for the protection of seagrass and therefore is not part of this audit.  Since there were no exceedences of response levels of environmental limits for turbidity locations in the south of the bay covered as part of this audit, this requirement is not applicable. Compliance with this requirement for other conformance locations will be covered as part of the next audit for the mechanisms used to monitor environmental performance.	Not applicable	GHD 2009, Channel Deepening Project Independent Audit – Activity 2 Audit 3 for the Office of the Environmental Monitor, March 2009, page 43.  PoMC Quarterly Project Report No.1, No.2, No.3 and No.4 (2008 and 2009).  Email notification to authorities by PoMC of exceedence of response level 1, 2 and environmental limits – 24 November 2008, 25 November, 4 March 2009.
32	In the event of exceedence of response levels (Section 6.2 of the Turbidity Detailed Design) or environmental limits (Table 23 in the CDP EMP, REV_6), undertake response measures as described in: <ol style="list-style-type: none"> <li>Annexure 5 of the CDP EMP (REV_5, Table 24 and Figure 13), and;</li> <li>Section 11 of the Turbidity Detailed Design.</li> </ol>	As discussed in item 31 above, four exceedences of response level 1 have occurred during the period of this audit (prior to 16 November 2008), none of which were for monitoring sites for the protection of seagrass in the south of the bay. No exceedences of response level 2 or environmental limits have occurred at conformance locations with environmental limits set for the protection of seagrass.  Compliance with the required response measures for exceedences of response level 1 prior to November 16 2008 was assessed as part of the audit of the mechanisms used to monitor environmental performance (GHD 2008), and full compliance was assigned for this requirement.  As discussed in the audit item above, since there were no exceedences of response levels of environmental limits for turbidity locations in the south of the bay covered as part of this audit, this requirement is not applicable.	Not applicable	Turbidity –Detailed Design CDP_ENV_MD_024 Rev 2  GHD 2009, Channel Deepening Project Independent Audit – Activity 2 Audit 3 for the Office of the Environmental Monitor, March 2009, page 43.

**Table 5 Requirements for monitoring plume intensity and extent**

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
<b>PLUME INTENSITY AND EXTENT DETAILED DESIGN</b>				
33	Undertake a core field-monitoring event for dredging in Project Area 3 (South of the Bay) following the commencement of dredging activities for the first time in accordance with the Plume Intensity and Extent Detailed Design (REV_1, Section 4.1.1).	<p>The requirement for core events (Core Event No. 4, Project Area 3) for plume intensity and extent was covered as part of the audit undertaken for the mechanisms used to monitor environmental performance (GH 2009), where it was confirmed that a core monitoring event was undertaken in the field in Project Area 3 over 16 days between 18 September and 12<sup>th</sup> October 2008.</p> <p>The auditor concludes that that compliance has been achieved with this requirement.</p>	Full compliance	GHD 2009, Channel Deepening Project Independent Audit – Activity 2 Audit 3 for the Office of the Environmental Monitor, March 2009, page 103-111.
34	Undertake additional field monitoring events to check plume characteristics in the South of the Bay. This monitoring event is only required if two TSHDs undertake works in the South Channel during 2009 (Plume Intensity and Extent Detailed Design, REV_1, Section 4.1.1).	<p>The latest dredge schedule (revision 2, update No. 4) shows that there is no period where two TSHDs undertook works concurrently in the south channel during 2009. The schedule indicates that on 10 April 2009, both the Prins and the Extended Queen are present in the south of the bay, but PoMC has provided written advice that only one vessel was dredging in the south of the bay on this date as well as vessel tracking data for the QotN and Prins that shows these vessels were not dredging concurrently on 10 April.</p> <p>Based on this information, no additional monitoring event in the south of the bay has been required and this requirement is therefore not applicable.</p>	Not applicable	<p>Latest EMP Dredging Schedule, revision 2, update 4, accessed 19/05/2009</p> <p>PoMC (2009) File note that states only one dredge in the south of the bay 10 April 2009.</p> <p>Equipment Tracking Chainage Report (SR021) – QotN (extended), 6 April – 13 April 2009.</p> <p>Equipment Tracking Chainage Report (SR021) – Prins de Nederlanden, 6 April – 13 April 2009.</p>
35	Prepare a report for each monitoring event in the south of the bay including the inputs listed in section 7 of the Plume Intensity and Extent Detailed Design.	<p>Section 7 of the Plume Intensity and Extent Detailed Design outlines what inputs are required into the reports for core monitoring events. A review of the content of the report for Core Event No. 4 (Project Area 3, south of the bay) found that the each of the inputs required by the detailed design were included.</p> <p>It is noted by the auditor that the detailed design has been revised since this core event was completed, Rev 2 of the detailed design was the current revision at the time that core event No. 4 was completed. Rev 3 of the detailed design includes additional inputs for inclusion into core event reports that were not required at the time that Core Event No. 4 was completed. The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	PoMC (2008) Plume Intensity and Extent Core Event Reports No.4 (South of the Bay – Project Area 3).

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
36	<p>PoMC to review the data to determine if any significant changes have occurred outside the expected variability by applying the Decision Framework for Management (Section 5 of the Plume Intensity and Extent, REV_1).</p> <p>The specific criteria to trigger further investigation are as follows:</p> <ul style="list-style-type: none"> <li>• For field data - where more than 20% of the 500 m square results against any one threshold indicate plume intensity above modelled conditions.</li> <li>• For satellite imagery – where MODIS satellite images indicate a turbidity plume consistently outside modelled extent, the corresponding field transect data and turbidity buoy data will be reviewed to determine if turbidity concentrations are likely to be below modelled concentrations in these areas.</li> </ul>	<p>This requirement for core events (Core Event No. 4, Project Area 3) for plume intensity and extent was assessed as part of the audit undertaken for the mechanisms used to monitor environmental performance (GHD 2009), where it was found that exceptions to the detailed design were minor and full compliance assigned for this requirement.</p>	Full compliance	GHD 2009, Channel Deepening Project Independent Audit – Activity 2 Audit 3 for the Office of the Environmental Monitor, March 2009, page 103-111.
37	<p>Where significant changes have occurred outside the expected variability (as determined from the steps outlined above), the PoMC will assess whether these changes are significant to the environment based on the decision framework and the processes outlined on page 18 of the Plume Intensity and Extent Detailed Design.</p>	<p>This requirement for assessment of plume intensity and extent for core events was covered as part of the audit undertaken for the mechanisms used to monitor environmental performance (see supporting evidence column), where it was found that no results outside expected variability occurred for Core Event 4 undertaken in Project Area 3 (south of the bay), and therefore no further assessment was required.</p> <p>The auditor concludes that this requirement is not applicable to the current audit.</p>	Not applicable	GHD 2009, Channel Deepening Project Independent Audit – Activity 2 Audit 3 for the Office of the Environmental Monitor, March 2009, page 103-111.
38	<p>If changes are determined to be significant to the environment, the PoMC will undertake an interim risk assessment to review the findings</p>	<p>This requirement is not applicable to the current audit as there were no results outside expected variability that required assessment for core events undertaken in project area 3 (south of the bay) (see item 37 above).</p>	Not applicable	Audit item no. 37

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
	compared with all other relevant baywide monitoring programs. The PoMC will prepare a report for the interim risk assessment.			
39	Based on the findings of the interim risk assessment, PoMC to identify appropriate management actions and implement actions in accordance with Section 2.7 of the CDP EMP (REV_6) and Section 5 of the Plume Intensity and Extent Detailed Design.	This requirement is not applicable to this current audit (see items 37 and 38 above).	Not applicable	Audit items no. 37 and no. 38

**Table 6 Requirements for monitoring health of seagrass to detect changes outside of expected variability**

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
<b>SEAGRASS DETAILED DESIGN</b>				
40	<p>Undertake seagrass monitoring using aerial photography collected annually as required by section 4.1.1 of the Seagrass Detailed Design (REV_1). This includes consideration of aerial photography on two levels (Figure 2a, Seagrass Detailed Design, page 6):</p> <ol style="list-style-type: none"> <li>1. Broad stretches of coastline, that form the major seagrass regions in the Bay – Altona to Point Wilson, Geelong Arm, Corio Bay, Eastern Bellarine Peninsula, Swan Bay, Mud Islands and Mornington Peninsula (the broad mapping to incorporate images at 9 specific regions)</li> <li>2. Nine specific regions (approximately 1 km<sup>2</sup>) for detailed aerial assessment including ground-truthing at Altona, Kirk Point, Point Henry West, Curlewis Bank, Point Richards, St Leonards, Swan Bay, Mud Islands and Blairgowrie.</li> </ol> <p>The first round of aerial photography to be collected in April – May 2008 (Section 8 Seagrass Detailed Design).</p>	<p>Results from aerial mapping undertaken in April 2008 are provided in Milestone Report No.2 (Hirst et al. 2008). Results for aerial mapping for Blairgowrie are also presented in Progress Report No. 1 (Ball and Heislars 2008). Review of Progress Report No. 1 and Milestone Report No. 2 and appendices shows that aerial photography has been considered on the two levels required by the detailed design. Exceptions to the detailed design that occurred for aerial photography were reported within exception reports. The review of the milestone reports undertaken by the audit team did not identify exceptions other than those reported in the exception reports. The exceptions to the detailed design for aerial photography were:</p> <ul style="list-style-type: none"> <li>• <u>The location of seagrass field and/or aerial assessment of regions at St Leonards (intertidal, shallow and deep), Blairgowrie (deep) and Mud Islands (deep) were changed (ER 2008#13)</u> – the assessment regions were moved to better represent the current distribution of seagrass (selection was originally based on baseline aerial mapping in 2000).</li> <li>• <u>The full extent of the Kirk Point aerial assessment was unable to be mapped due to poor water clarity (ER 2008#20)</u>. There were high algal loads in the 2008 aerial photography, which prevented mapping the outer zone in 2008 (ie. only the inner zone was mapped in 2008). In order to enable comparisons of 2008 results against historical data, all historical data at Kirk Point region was also split into an inner and outer zone, so that comparisons of results against expected variability could still be made.</li> </ul> <p>The auditor considers that the above exceptions are minor and that the program was undertaken as required to the extent practicable. The auditor considers these exceptions should not affect the ability of the program to meet its objectives. The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	<p>Hirst et al (2008) Baywide Seagrass Monitoring Program – Milestone Report No. 2</p> <p>Ball and Heislars (2008) Baywide Seagrass Monitoring Program - Progress Report No.1.</p> <p>Seagrass Exception Report ER 2008#13, January 2008.</p> <p>Seagrass Exception Report ER2008#20, February 2008.</p> <p>Electronic appendices to Milestone Report No.2</p> <p>GIS Shapefiles showing mapping extent of seagrass undertaken at the 9 regions in the bay.</p>
41	Undertake seagrass monitoring using 'ground truthing' with underwater video	A review of Milestone Report No. 2 confirms that 'ground-truthing' of seagrass mapping from aerial photography has been undertaken with underwater video at the	Full compliance	Hirst et al (2008) Baywide Seagrass Monitoring Program –

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
	<p>at all 9 regions (Altona, Kirk Point, Point Henry West, Curlewis Bank, Point Richards, St Leonards, Swan Bay, Mud Islands and Blairgowrie) in the 1<sup>st</sup> year of the monitoring program. For following years, undertake 'ground truthing' at six detailed field assessment regions (Kirk Point, Point Richards, St Leonards, Swan Bay, Mud Islands and Blairgowrie). Between 10-30 'ground truthing' sites to be sampled for each region for each monitoring event.</p> <p>The first round of 'ground truthing' to be undertaken in April – May 2008 (Section 8 Seagrass Detailed Design, REV_1).</p>	<p>9 regions in the first year (2008) as required by the detailed design. In particular, underwater video has been used to confirm that the type and density of vegetation/substrate (seagrass and/or macroalgae or other substrate such as reef or bare sand) seen in the field matched that mapped using aerial photography. Examples of still images from underwater video are shown in Milestone Report No. 2 (Figure 13); Figures 4-12 shows the aerial assessment region overlaid with the ground-truthing sites.</p> <p>Exceptions to the detailed design that occurred were reported in exception reports. Review of the Milestone Reports did not identify exceptions that had not been reported in the exception reports. The exceptions to the seagrass detailed design for 'ground-truthing' with underwater video were as follows:</p> <p>» <u>The number of video ground-truthing sites at Kirk Point, Curlewis Bank and St Leonard mapping regions was &lt;10 (Exception Report ER2008#20)</u> – shallow depths due to low tides on the day of the video ground-truthing sites at Kirk Point prevented the survey vessel accessing the inner ground-truthing sites at Kirk Point in May 2008 and only 3 of 19 video sites in this region were ground-truthed. The proposed in-shore video sites at Curlewis Bank could not be reached with the survey vessel due to shallow depths and dense seagrass clogging the outboard motor (9 out of 12 video sites ground-truthed). The final mapping region at St Leonards only enclosed 6 of the 19 video sites.</p> <p>The exception report provides an impact analysis for each of these exceptions. A review of the impact analysis in the exception report concludes that, based on expert opinion, the above exceptions are minor and should not affect the ability of the program to meet its key objectives or cause the bay environment to be seriously affected. The auditor concludes that compliance has been achieved with this requirement.</p> <p>The auditor notes that there is no requirement in the detailed design for all video ground-truthing for each individual site to be undertaken in the one field trip. It is possible that, for shallow sites at Kirk Point that were missed due to low tide, additional sites could have been completed by revisiting these sites on another day when the tide was higher. The auditor notes that as a result of this exception, the 'before checks' section of the SOP for undertaking video ground-truthing in the field has been updated to include a requirement to assess tide tables to identify optimum times for accessing shallow video ground-truthing sites at each region by vessel. To further assist in the forward planning of field events, the 2009 Seagrass Project Master Plan (Gantt chart) shows the window of time during which fieldwork is to be undertaken.</p>		<p>Milestone Report No. 2</p> <p>Seagrass Exception Report ER2008#20, February 2008.</p> <p>SOP – Seagrass Monitoring Undertaking Aerial Photography Ground-truthing Video Field Surveys, December 2008</p> <p>2009 Seagrass Project Master Plan (Gantt chart showing a snapshot of planned field work for the seagrass project).</p>

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
42	<p>Assess changes in seagrass health at each of the 6 detailed field assessment regions (Kirk Point, Point Richards, St Leonards, Swan Bay, Mud Islands and Blairgowrie). This is to be undertaken quarterly for the 1<sup>st</sup> two years of the project as required by Section 4.1.1 (page 11-12) of the Seagrass Detailed Design.</p> <p>The first detailed field assessment to be undertaken in April – May 2008 (Section 8 of the Seagrass Detailed Design, REV_1).</p>	<p>Four Milestone Reports have been produced over the audit period for this project and each of these reports detail the changes in seagrass that have occurred at each of the 6 detailed field assessment regions. The auditor notes that there are some exceptions to the detailed design for assessment regions. These exceptions are detailed in exception reports. Review of the milestone reports by the auditor did not identify exceptions that had not been reported in the exception reports. The exceptions to the detailed design for the 6 detailed assessment regions were:</p> <p><u>Exception Report for Milestone Report No. 1 (ER2008#13, Version 2)</u></p> <ol style="list-style-type: none"> <li>1. The location of seagrass field and/or aerial assessment regions at St Leonards (intertidal, shallow and deep), Blairgowrie (deep) and Mud Islands (deep) were changed.</li> <li>2. No intertidal seagrass was present at the Kirk Point and Blairgowrie regions.</li> <li>3. Fixed markers were not installed to monitor the outer edge of seagrass beds at the regions with deep seagrass points (Point Richards, St Leonards, Mud Islands and Blairgowrie).</li> <li>4. The upper boundary of the intertidal seagrass was not measured at the Swan Bay region.</li> <li>5. The location of the shallow field-assessment plot established at Swan Bay in April 2008 did not match the position of the shallow plot used in the Natural Heritage Trust multi-regional seagrass monitoring program 2004-07.</li> </ol> <p><u>Exception Report for Milestone Report No. 2 (ER2008#20)</u></p> <ol style="list-style-type: none"> <li>1. Exceptions no.3 and no. 4 from ER2008#13 still apply.</li> <li>2. The 0.0625 m2 fixed quadrats established to measure shoot density were sub-sampled at Swan Bay, Mud Islands, Point Richards, Blairgowrie, St Leonards and St Leonards 2.</li> </ol> <p><u>Exception Report for Milestone Report No.3 (ER2008#28)</u></p> <ol style="list-style-type: none"> <li>1. Exceptions no. 3 and no. 4 from ER2008#13 still apply.</li> </ol> <p><u>Exception Report for Milestone Report No.4 (ER2008#30)</u></p> <ol style="list-style-type: none"> <li>1. Exceptions no.3 and no.4 from ER2008#13 still apply.</li> </ol> <p>The exception report provides an impact analysis for each of these exceptions. A review of the impact analysis in the exception report concludes that, based on expert</p>	Full compliance	<p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.1, January 2009.</p> <p>Hirst et al (2008) Baywide Seagrass Monitoring Program – Milestone Report No. 2, January 2009.</p> <p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.3, March 2009.</p> <p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.4, August 2009.</p>

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
		<p>opinion, the above exceptions are minor and should not affect the ability of the program to meet its key objectives or cause the bay environment to be seriously affected. It is noted that changes were made on 27 May 2009 to the detailed design (REV_3) to include changes to methods recommended in exception reports.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>		
43	<p>In addition to monitoring changes in seagrass, monitor changes in the factors that influence seagrass (page 13 Seagrass Detailed Design, REV_1) including:</p> <ul style="list-style-type: none"> <li>• Light (measured continuously with loggers as the specified sites)</li> <li>• Turbidity (data from four conformance sites and two additional sites near Kirk Point and Point Richards installed as part of the turbidity monitoring program)</li> <li>• Nutrients (phosphate, nitrate and nitrite, ammonia and silica as measured monthly at 11 sites around the bay as part of the Water Quality Monitoring Program)</li> <li>• Epiphytes</li> </ul> <p>These parameters are to be monitored at the six detailed field assessment regions (Kirk Point, Point Richards, St Leonards, Swan Bay, Mud Islands and Blairgowrie) as required by section 4.1.2 of the Seagrass Detailed Design (REV_1).</p>	<p>Four Milestone Reports have been produced to 10 April 2009 that cover monitoring using aerial photography and field assessments for April/May 2008, July/August 2008, October/November 2008 and January/February 2009. A review of these Milestone Reports found that monitoring of factors that influence seagrass had taken place in accordance with the detailed design. There were no exceptions reported for this requirement.</p> <p>It was noted from the review of the milestone reports that there are gaps in light monitoring data for some sites. Issues with the reliability of the light loggers are discussed in Milestone Report No. 1 to No. 4.</p> <p>Section 6 of the detailed design notes that in the past there has been a 30% failure rate of Odessey light meters and that alternatives will be examined for deployment. Considerable attention has been paid to the maintenance of these loggers (see item 46 below) and Appendix 2 of Milestone Report No. 2 lists measures undertaken to reduce the rate of logger failure. The auditor also notes that the detailed design specifies a service interval for the light meters designed to ensure performance. The auditor found that the requirement for servicing has been met or exceeded (see audit item 46). Furthermore, additional sets of backup meters have been deployed at the Blairgowrie, Mud Islands and St Leonards sites. Email evidence has also been supplied that states that the frequency of servicing has been further increased from every two months to every six weeks for light loggers at Blairgowrie and Mud Island to reduce data loss. This will occur until the end of July 2009 to cover the period of dredging in the south of the bay. This correspondence between DSE, FRB (DPI) and PoMC also identifies that the failure rate has not impacted on meeting the objective of the program. This provides evidence of continuous improvement for light logger data for this program and the auditor concludes that compliance has been achieved with this requirement.</p> <p>There is an opportunity for improvement to include in a future milestone report a discussion on why the data collected is adequate. This will document, in a readily available form, that the quality of the data and its ability to meet the objectives of the program has been considered.</p>	Full compliance	<p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.1, January 2009.</p> <p>Hirst et al (2008) Baywide Seagrass Monitoring Program – Milestone Report No. 2, January 2009.</p> <p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.3, March 2009.</p> <p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.4, August 2009.</p> <p>Electronic Appendices to Milestone Reports No.1 – No.4.</p> <p>Appendix 2 of Milestone Report No.1 and No.2- details of QA/QC procedures including the deployment and retrieval of light loggers.</p> <p>Emails between DSE (FRB) and PoMC detailing measures made to reduce logger failure rate and to increase the frequency of logger retrieval.</p>

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
44	<p>Record evidence of other influencing factors on seagrass qualitatively and descriptively in field notes collected during monitoring including details on the following:</p> <ul style="list-style-type: none"> <li>• Environmental conditions</li> <li>• Desiccation stress</li> <li>• Spadices (contribution of seeds to meadow regeneration)</li> <li>• Drift algae</li> </ul> <p>This information is to be collected and recorded as specified in section 4.1.2 of the Seagrass Detailed Design (REV_1).</p>	<p>Examples of completed field sheets and field notes from field investigations were supplied from seagrass field events undertaken over the audit period as evidence that other influencing factors on seagrass had been considered within field notes.</p> <p>The field sheets have been designed with a built in section that covers drift algae and a section for 'other' observations, which have been completed in the field sheets.</p> <p>The field notes record observations related to the density of seagrass in each quadrat, the weather conditions, and the presence of other factors that may influence seagrass, such as swan grazing. The need to replace light sensors was also noted where applicable.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	<p>Seagrass Field Data Sheets, 14 May 2008, 5 August 2008, 24 August 2008, 25 August 2008, 16 October 2008, 28 October 2008, 21 January 2009.</p> <p>Seagrass field notes 14 May 2008, 5 August 2008, 22 August 2008, 24 August 2008, 25 August 2008, 28 October 2008, and 21 January 2009.</p>
45	<p>At the completion of the first formal field event, a workshop will be held to review the program's field and data assessment methods.</p>	<p>A copy of the agenda and minutes from a workshop held on 28 August 2008 has been provided as evidence of this requirement. According to the agenda, the seagrass program was discussed at this workshop along with the fish stock and recruitment sub-programs.</p> <p>The auditor concludes that compliance has been achieved with this requirement.</p>	Full compliance	<p>FRB (2008) Channel Deepening Baywide Monitoring Program – Review Workshop 2008: document outlining the agenda and workshop outcomes. Workshop date: 28<sup>th</sup> August 2008, DPI Queenscliff Centre.</p>
46	<p>Implement quality control and assurance procedures (Section 6 of the Seagrass Detailed Design). In particular, the following QA/QC measures will be applied in accordance with the detailed design (REV_1):</p> <ol style="list-style-type: none"> <li>1. Following data entry, and before data analysis, data is routinely checked for accurate translation from data sheets, before computer checks for anomalous data;</li> <li>2. Light meters will be calibrated against a Licor light meter at the</li> </ol>	<ol style="list-style-type: none"> <li>1. An email that details the process used to enter data and routinely check for errors has been supplied as evidence. As part of this process, data is entered from photocopied datasheets into the electronic database. Once entered, the database is printed and used to check data entry. Any errors on the printed database compared with the field sheets is noted on the hard copy of the database and corrected. Scanned copies of an original data sheet, the initialled photocopied data sheet and the printed database with corrections required were also provided as evidence of this process. The auditor concludes that compliance has been achieved with this requirement.</li> <li>2. Review of an Excel spreadsheet for April 2008 showed a linear relationship between readings from the Odyssey loggers against the Licor light meter for calibration purposes at the start of the program. This file also notes that the first deployment of the loggers was in April 2008. Appendix 2 in Milestone Report No.1 and No.2 and Appendix 3 in Milestone Report No.3 and No.4 provides</li> </ol>	Full compliance	<p>Excel spreadsheet – DPI Seagrass Licor Data Calib Coeffs_April08 Agency Internal.xls (evidence of calibration of odyssey loggers against licor light meter).</p> <p>Appendix 2 of Milestone Report No.1 and No.2- details of QA/QC procedures including the deployment and retrieval of light loggers.</p> <p>Appendix 3 of Milestone Report No.3 and No.4 – Light logger performance (October-December</p>

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	<p>start of the program. Odyssey light meters will be exchanged/downloaded every four months, except for the two loggers nearest the CDP (Blairgowrie and Mud Islands), which will be downloaded every 2 months.</p>	<p>details on light logger performance for each monitoring period and includes details on when loggers were deployed, retrieved and reasons for data loss. The retrieval dates quoted in these appendices show that loggers were often exchanged/downloaded at a greater frequency than that required by the detailed design to reduce failure/fouling. The auditor concludes that compliance has been achieved with this requirement.</p>		<p>2008 and January-February 2009). Email from FRB (DPI) detailing the QA process and examples of QA documentation for data recorded on field sheets on the 21 January 2009.</p>
47	<p>Project Deliverables completed as required by Section 7 of the Seagrass Detailed Design (REV_1), including:</p> <ol style="list-style-type: none"> <li>1. Collation of monitoring data after each event forwarded to the DSE, PoMC and DEWHA at the first availability, in the form of a brief field report. Data will be in a format suitable for informing the Decision Framework for Management in Section 5.</li> <li>2. The delivery of a report within 6 weeks of the completion of each field event and the receipt of aerial photographs (where applicable). The report will also be made available to DSE, PoMC and DEWHA. Each second report should also incorporate the findings from aerial photography. Each report will present (where appropriate) the inputs required by the Seagrass Detailed Design, including outputs from the required data assessment and interpretation as detailed in Section 4.2.1 and Section 4.2.2 of the Seagrass Detailed Design.</li> </ol> <p>It is noted that significant changes to the requirement for timing of reports</p>	<ol style="list-style-type: none"> <li>1. Progress Report No. 1 (Ball and Heislars 2008) summarises results of aerial mapping (April 2008) and ground-truthing (May and August 2008) at the Blairgowrie region. The Decision Framework (section 5 of the seagrass detailed design) allows for quantitative assessment for changes outside expected variability using aerial mapping for the Blairgowrie site only in the first year of monitoring (2008). A review of Progress Report No.1 found that it contains data in a format suitable for informing the Decision Framework for Blairgowrie. The auditor concludes that compliance has been achieved with this requirement.</li> <li>2. Four Milestone Reports were delivered during the audit period. There were exceptions for the delivery of Milestone report No. 1 and No.2 in accordance with the requirements of the REV_1 detailed design as follows: <u>Milestone Report No.1 (April-May 2008) and Milestone Report No. 2 (April-August 2008) - timing and content of the report not as specified in the detailed design (ER2008#13 and ER2008#20).</u> Timing altered to reflect more realistic timeframes to allow for new/additional QA/QC procedures for review of internal reports (milestone reports finalised in January 2009). Variation proposed to detailed design REV_1 to make deadlines more suitable based on agreed 2008/09-work plan.  The auditor notes that changes have been made to Rev_2 of the seagrass detailed design for reporting requirements and that these changes fit with the approximate timeline taken to complete Milestone Report No.1 and No.2.  Milestone Report No.3 (Oct/Nov 2008 data) and Milestone Report No. 4 (Jan/Feb 2009 data) were delivered after Rev_2 of the detailed design had come into effect. The requirements for delivery of these two reports under Rev_2 were: <ul style="list-style-type: none"> <li>• 55 working days from completion of the Oct/Nov field event and present findings from seagrass fieldwork in Oct/Nov; and</li> <li>• 55 working days from the completion of the Jan/Feb field event and</li> </ul> </li> </ol>	Full compliance	<p>Ball and Heislars (2008) Baywide Seagrass Monitoring Program – Progress Report No.1, August 2008.</p> <p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.1, January 2009.</p> <p>Hirst et al (2008) Baywide Seagrass Monitoring Program – Milestone Report No. 2, January 2009.</p> <p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.3, March 2009.</p> <p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.4, August 2009.</p> <p>Seagrass Exception Report ER 2008#13, January 2008.</p> <p>Seagrass Exception Report ER2008#20, February 2008.</p>

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
	<p>have been made between REV_1 and REV_2 (September 2008) of the Seagrass Detailed Design. Where these changes are applicable to reports within the audit criteria, they will be considered in the audit findings.</p>	<p>present findings from the field work in Jan/Feb.</p> <p>Milestone Report No.3 is dated 24 March 2009 and Milestone Report No. 4 is dated 30 April 2009. This indicates both reports were delivered within the timeline specified within Rev_2 of the detailed design.</p> <p>Overall, the auditor concludes exceptions to Rev_1 of the detailed design for Milestone Report No.1 and No.2 for report delivery were minor and should not affect the ability of the program to meet its objectives or cause the environment to be seriously affected. The auditor concludes that compliance has been achieved with this requirement.</p>		
48	<p>PoMC to review the data to determine if any significant changes have occurred outside the expected variability by applying the Decision Framework for Management (Section 5 of the Seagrass Detailed Design, REV_2).</p>	<p>The data required to make a quantitative assessment of changes outside expected variability is for aerial mapping for the Blairgowrie site (April-May 2008). This is because Blairgowrie is the only site for which historical data suitable for statistical comparison is available (aerial percent cover) to inform the decision framework. The detailed design states that a similar assessment could be used for aerial percent cover at other sites in future years if/once the data is available. A review of the analysis presented in Progress Report No. 1 indicates that data for Blairgowrie had been assessed as required by the decision framework and that there were no significant changes outside expected variability.</p> <p>In addition the detailed design states that expert opinion can be used to assess field data for results outside expected variability. This is due to the limited coverage of historical data for field-based assessments. A review of milestone reports (No.1, No.2, No.3 and No.4) found that there were some notable declines in seagrass health between 2006-2008 (beginning prior to the commencement of the CDP), with this decline at some sites attributed to a continuation of the decline seen in recent years. All four milestone reports concluded that, based on expert opinion, the results during the Baywide Monitoring Program period were within expected variability.</p> <p>The auditor concludes that full compliance has been achieved with this requirement.</p>	Full compliance	<p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.1, January 2009.</p> <p>Ball and Heislars (2008) Baywide Seagrass Monitoring Program – Progress Report No.1, August 2008.</p> <p>Hirst et al (2008) Baywide Seagrass Monitoring Program – Milestone Report No. 2, January 2009.</p> <p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.3, March 2009.</p> <p>Hirst et al. (2008) Baywide Seagrass Monitoring Program – Milestone Report No.4, August 2009.</p>
49	<p>Where significant changes have occurred outside the expected variability (as determined from the steps outlined above), the PoMC will assess whether these changes are significant</p>	<p>No significant changes outside expected variability have occurred within this audit period for seagrass monitoring, and therefore this requirement is not applicable.</p>	Not applicable.	Audit item no. 48 above.

Item	Requirement	Audit Findings (to 10 April 2009)	Compliance	Supporting Evidence
	to the environment based on the decision framework and the processes outlined on page 19-21 of the Seagrass Detailed Design.			
50	If changes are determined to be significant to the environment, the PoMC will undertake an interim risk assessment to review the findings compared with all other relevant baywide monitoring programs. The PoMC will prepare a report for the interim risk assessment.	This requirement is not applicable to this current audit (see item 49 above)	Not applicable	Audit item no. 49 above
51	Based on the findings of the interim risk assessment, PoMC to identify appropriate management actions and implement actions in accordance with Section 2.7 of the CDP EMP (REV_6) and Section 5 of the Seagrass Detailed Design.	This requirement is not applicable to this current audit (see items 49 and 50 above).	Not applicable	Audit items no. 49 and no.50



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**Document Status**

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