

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF INTRODUCTORY MEETING

**Date:** 17th December 2008, 9.00am to 12.45pm  
**Location:** QV1 Building, Level 30 – Conference Room 30:23  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #1  
**Attendees:** All panel members other than those for whom apologies are noted. Mr Bernard Bowen attended as a guest.  
**Apologies:** Mr Russell Lagdon, Dr Kirstin Dobbs and Dr Mark Hamann

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#### Project Update

An update on the status of the Gorgon Project was provided, including the reason behind the shift from the approved 10 million tonnes per annum (MTPA) development concept to the current 15 MTPA development concept. The change to the Project's development concept and production capacity includes the addition of another 5 MTPA LNG train, an increase in the rate of carbon dioxide injection, modification to the marine offloading facility, jetty, turning basin, and greater use of modularisation. These changes have required the Project to proceed through an additional formal environmental assessment, set at a Public Environmental Review (PER) level of assessment, by the State and Commonwealth. The PER has progressed through the public review period and Chevron is in the process of compiling responses to submissions.

#### Governance

##### MTEP Overview

The Chair provided an overview of the establishment of the three Expert Panels (Quarantine, Construction Dredging Environmental and Marine Turtles Expert Panels). The Chair provided further details on the MTEP role and responsibilities and his expectations of Panel Members, the activities of the Panel and importance of these activities to the Project.

Panel Member's attention was drawn to the requirements of the Ministerial Statement No. 748 and EPBC 2003/1294 as the activities and role of the Panel shall be guided by these documents.

##### Lessons Learnt from Past Gorgon Expert Panel

Dr Bernard Bowen, the past Gorgon Quarantine Expert Panel and Advisory Committee Chair, was invited to provide the Panel with his views of the success and lessons learnt from the past Quarantine Expert Panel and Advisory Committee. Dr Bowen explained how these have or should be applied to the new Expert Panels and made the key observations.

##### Terms of Reference & Operating Guidelines

The Chair explained the content and structure of the MTEP Terms of Reference and each of the key provisions was reviewed. Support was obtained for the Terms of Reference content with some amendments suggested.

The Chair also explained the content of the Expert Panel Operating Guidelines and went through each of the key provisions. The Expert Panel Operating Guidelines were reviewed and support was obtained for its content with some amendments suggested.

An explanation as to the relationship between MIS No. 748 and EPBC 2003/1294 approval documents and their conditions was provided.

## Long Term Marine Turtle Management Plan

An overview of the framework and timeline for review of the Long-term Turtle Management Plan was provided and the key elements explained. The information covered was per the presentation material provided at the Meeting.

It was confirmed that while the Management Plans apply to the whole of the Island it focuses on areas identified as potentially high risk; for example there will be monitoring on the northwest beaches but less than the east coast beaches. Similarly, it was confirmed that foraging turtles would also be considered in the Management Plans.

Clarification was provided on the timing of the preparation and submission of the Management Plans. The latest that all Management Plans need to have been approved by the Minister is June 2009. Due to the large number and various other dependencies and interdependencies the Plans will be progressively prepared and submitted. Therefore the Panel must review and provide advice no later than end of April. It was agreed that the draft Long-term Turtle Management Plan, and any other Management Plans, need to be provided to the Panel two weeks prior to any meeting to ensure adequate time is available to review these documents.

### Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF WORKSHOP #1

- Date:** 10th March 2009, 8.30am to 1.00pm
- Location:** QV1 Building, Level 18 – Conference Room 18:20
- Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Workshop #1
- Attendees:** All panel members other than those for whom apologies are noted. Dr Milani Chaloupka, Mr Jeremy Fitzpatrick from RPS and Mrs Daniela Ratcheva from Chevron attended as guests.
- Apologies:** Dr Julia Martin
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The Chair expressed the view that the material presented during the workshop would build on what the Panel had seen during their tour of Barrow Island and provide further understanding of the environmental factors and work undertaken by Chevron.

#### Summary of Barrow Island Turtle Studies

Dr Pendoley provided a summary of the extent and nature of the marine turtle studies undertaken on or associated with her work on Barrow Island. The presentation highlighted the six main programmes undertaken, which involve tagging, tracking, hatchling orientation, hatchling emergence and success, satellite tracking, and light behavioural studies.

#### Achieving Statistical Power of 0.8

Dr Chaloupka provided a presentation on assessing marine turtle abundance trends, and discussed the duration of sampling and data required to achieve the statistical power of 0.8, as required by the Ministerial approval conditions. The benefits of applying a combination of demographic studies through a capture-mark-recapture approach, rather than just abundance trends used in isolation, and how this affects time required to achieve a statistical power of 0.8 trend was discussed.

#### Mapping of Marine Benthic Habitats

Dr Fitzpatrick presented an overview of the comprehensive marine habitat mapping survey work conducted on the east coast of Barrow Island, and along pipeline routes. These studies have been undertaken over the past 5 or more years and have progressively expanded and refined the extent of habitat mapping in the region. The various methods of data collection and verification were explained and results discussed.

#### Chevron Risk Matrix and Hazard Analysis

Mrs Ratcheva presented material explaining Chevron's highly structured approach to environmental risk management and how this fits within broader project planning. This covered the risk work undertaken for the development of the EIS / ERMP, PER and MIS 748 deliverables and other project internal HAZID risk assessments for design and construction purposes where applicable to marine turtles and their potential stressors. A brief explanation was also provided on the development and application of the environmental consequence interpretative guideline developed to assist in allocating the appropriate level of consequence to each risk item identified.

#### Light Management Strategy

Mrs Ratcheva provided a summary on the Project's Lighting Basis of Design (document) and light management strategy for permanent facilities and construction activities. This included an explanation of what the key facilities and lighting stressors would be present during the operating and construction phases of the project.

## Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF MEETING #2

**Date:** 28th January 2009, 10.00am to 12.00pm  
**Location:** QV1 Building  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #2  
**Attendees:** All panel members other than those for whom apologies are noted.  
**Apologies:** Dr Julia Martin

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#### Governance

##### Terms of Reference

The revised Terms of Reference were explained to the Panel. Key changes included the introductory paragraph, change to the 'Role of the MTEP' to reflect the exact wording of Ministerial Statement No.748 Condition 15 (2), and inclusion of a new section on 'Other Requirements' that provides details of the other State and Commonwealth conditions requiring the MTEP to be consulted.

##### Operating Guidelines

The revised Expert Panel Operating Guidelines were explained to the Panel. The changes made to the Operating Guidelines were made to reflect the input of the MTEP and input from the other Panels. The Chair informed the Panel that the Operating Guidelines have been finalised and executed by the three Expert Panel Chairs.

##### Framework and Timeline for Review of Management Plans

The draft (Revision B) Expert Panel Ministerial Deliverable Review Process was reviewed and discussed by the Panel. The Chair explained that the Panel should form a collective view and provide advice as a unified Panel and not as a group of individuals. The Panel agreed that the Expert Panel Ministerial Deliverable Review Process should be altered to include an additional step. This step shall require the Panel to be issued with a list of consolidated comments by the Secretariat for review by the whole Panel.

The schedule for the Long Term Marine Turtle Management Plan (LTMTMP) was reviewed by the Panel and the key dates explained. Similarly the schedule for the Coastal Stability Management and Monitoring Plan (CSMMP) was reviewed. The other two schedules, the Marine Facilities Coastal Construction Management Plan and the Dredge and Spoil Disposal Management and Monitoring Plan, were tabled for the Panel members' consideration outside of the meeting.

##### Draft Long Term Marine Turtle Management Plan

Given the majority of Panel members had not had an opportunity to review the preliminary draft LTMTMP it was agreed that Panel members would review the Plan and provide their individual comments in writing after the meeting.

The Panel member's review of the preliminary draft LTMTMP should be a strategic review of the scope, structure and content of the plan and how well it addresses the requirements of the Ministerial Statement No.748 Condition 16. Each Panel member was provided with an opportunity to share any initial comments or thoughts on the preliminary draft Plan.

##### Draft Coastal Stability Management and Monitoring Plan

Each Panel member was provided with an opportunity to share any initial comments or thoughts on the draft CSMMP.

## Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF MEETING #3

**Date:** 9th February 2009, 2.00pm to 3.30pm  
**Location:** QV1 Building  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #3  
**Attendees:** All panel members other than those for whom apologies are noted.  
**Apologies:** Dr Julia Martin

The meeting focus was to reach a consensus on the collective individual comments by the Panel on the Draft Coastal Stability Management and Monitoring Plan and the Preliminary Draft Long Term Marine Turtles Management Plan for submission to the Proponent.

#### Panel Collective Comment and Document Review

Chevron was invited to provide initial feedback on the comments provided by members. The majority of comments can be addressed directly and relatively easily. The key areas of the Panel's concern covered the need for more information in certain areas clarification of terms and statements, peer review of background reports and the level of uncertainty and gaps in information identified. It was recognised that there would be various comments that Chevron will need to explore further with the Panel and seek their advice. However, where appropriate, responses and general improvements to these draft Plans would be incorporated and undertaken in parallel to maintain schedule.

Chevron indicated they had now provided all the referenced turtle studies to the Members for their information and understanding.

A range of matters related to the comments provided by the Panel members were expanded on by Panel members.

#### Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

Panel Member's Role	Panel Member	Panel Member's Alternate
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF MEETING #4

**Date:** 10th March 2009, 1.00pm to 3.00pm  
**Location:** QV1 Building  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #4  
**Attendees:** All panel members other than those for whom apologies are noted. Dr Milani Chaloupka attended as a guest.  
**Apologies:** Dr Julia Martin

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The primary focus of the meeting was to discuss Chevron's response to the Panel's comments on the Long Term Marine Turtle Management Plan (LTMTMP).

#### **Draft Long Term Marine Turtle Management Plan**

The Chair led discussion on Chevron's response to the Panel's comments on the LTMTMP should focus on substantial issues where clarification was required or Members were in disagreement with a response. The Panel discussed key focus items that needed further discussion to reach alignment, including:

- the extent, method and result of current research;
- the need for past studies and data analysis to be peer reviewed and published;
- future research and studies needed to fill any information gaps;
- setting of appropriate Key Performance Indicators (KPIs);
- inclusion of information on marine turtles other than the flatback in the Plan and the application of management measures to protect marine turtles other than the flatback; and
- opportunity to review other Impact Mitigation Strategies (IMs) that deal with potential turtle stressors.

The Ministerial approval condition requires that the Plan be review every five years, which provides the Panel an opportunity to provide advice on its continuous improvement.

The MTEP would benefit from viewing all/specific data and not 'averages' or incomplete analysis of results.

When considering future research the panel should focus on referring to these as studies that are needed to fill gaps in the current knowledge base necessary to better manage the Projects influence on turtles. For example the survival of hatchlings once they enter the water – where do they go and will they take longer to get-out to sea as a result of the Project's facilities. Consideration should be given to the prioritisation and timing of these studies and inclusion in the Plan.

#### **Draft Coastal Stability Management and Monitoring Plan**

The Panel briefly discussed the draft Coastal Stability Management and Monitoring Plan (CSMMP). Discussion was had on whether the CSMMP related only to the terrestrial and intertidal areas of the coast or whether it should include information on offshore impacts and monitoring, given the extent to which the MOF and Jetty extended offshore. Chevron indicated that the focus of this Plan was the areas immediately north and south of Town Point and that the offshore impacts and monitoring were dealt with in other Plans, such as the Dredge and Spoil Disposal Management and Monitoring Plan.

## Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF MEETING #5

**Date:** 10<sup>th</sup> March 2009, 1.00pm to 3.00pm  
**Location:** QV1 Building  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #5  
**Attendees:** All panel members other than those for whom apologies are noted.  
**Apologies:** Dr Julia Martin

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#### **Expert Panel Governance**

##### Terms of Reference

The Chair reviewed the status of the Terms of Reference and advised that they had been provided to the Minister for Environment in accordance with Statement 748 Condition 15.4 and the Minister has since reviewed and sent a letter to Chevron approving the Terms of Reference without alteration. The finalised Terms of Reference has been executed by the Chair.

The Panel discussed the potential challenges and way forward to ensure all requirements of Condition 16.4 were adequately addressed within the current timeframe. This included discussion on the timing of when Chevron would be able to establish 'measurable limits' and whether this information would be available for inclusion in the Long Term Marine Turtle Management Plan (LTMTMP).

Further discussion was also had in relation to potential sources of information and pre-existing, accepted limits and levels. Suggestions include ANZECC water quality guidelines, World Health Organisation levels etc. The Panel also suggested that Dr Chaloupka should be engaged to assist in the process of determining measurable limits and advice on achieving a statistical power of 0.8.

##### Operating Guidelines

The Panel was advised that the Minister welcomes and endorses the Expert Panel Operating Guidelines

##### Meeting with the Minister

The Chair reported on a meeting between the Minister and Expert Panel Chairs on 25 March that discussed the role and function of the Panels and recent progress. The meeting was beneficial in explaining the role of the Panels and to understand expectations, develop confidence in the Panels and process and establish a working relationship.

#### **Long Term Marine Turtle Management Plan**

Chevron provided an update on recent progress made in revising the LTMTMP. This included addressing the comments received from the Panel Members.

Chevron provided a brief overview of the outcomes from the recent Marine Turtle Risk Assessment Workshop. Based on advice received from the Panel during the last meeting and due to Chevron now utilising a 6x6 Risk Assessment Matrix, as opposed to the earlier 5x5 version, a review of previously identified hazards, and their consequence and likelihood to marine turtles, was undertaken.

As agreed during the 2 Workshops, Chevron would revise the Performance Measure Table and the Research and Monitoring Framework and circulate (as Revision B) to Panel Members by the end of the week for their review.

## **Coastal Stability Management and Monitoring Plan**

Chevron provided a brief overview of the current status of the draft Coastal Stability Management and Monitoring Plan (CSMMP). It was noted that Chevron was still in the process of revising the Plan to address the comments provided by Panel members and other matters that were still being worked through.

### **Advice to the Minister and Proponent**

The Chair advised the Panel on the need to commence the process of drafting their Advice to the Minister and Proponent as to the adequacy of the LTMTMP. It was agreed that the Secretariat and the Chair would develop a framework document for review and discussion by the Panel at the next meeting.

## **Dredging Spoil Disposal Management and Monitoring Plan**

It was noted that the Gorgon Dredge and Spoil Disposal Management and Monitoring Plan (DSDMMP) no longer includes any turtle management measures. Chevron advised that this section had been removed to avoid inconsistencies with the outcomes of the Marine Turtle Risk Assessment Workshop. Once determined this information will be incorporated into the DSDMMP and once Revision C is completed this will be provided to the Panel for consideration and discussion.

### **Marine Turtle Expert Panel Members**

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF MEETING #6

**Date:** 10<sup>th</sup> March 2009, 1.00pm to 3.00pm  
**Location:** QV1 Building  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #6  
**Attendees:** All panel members other than those for whom apologies are noted. Dr Milani Chaloupka, Mr Billy Cash from Chevron and Mr Shane Waldeck from Chevron attended as guests.  
**Apologies:** Dr Julia Martin and Dr Mark Hamann

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#### Long Term Marine Turtle Management Plan (LTMTMP)

##### Advice to the Minister and Proponent (Framework)

A draft framework for the proposed Advice to the Proponent and Minister was provided to the MTEP with a brief explanation by the Chair as to its purpose, structure and content. The Panel stressed the need for the MTEP to adhere to the Ministerial conditions as closely as practicable.

##### EPA Report 1323 & Implications for MTEP

The Chair provided the Panel with a background of the EPA Report (No. 1323), which was released on 30 April 2009. The Chair explained that the Chairs of the three Expert Panels had been consulted since the release of the EPA's Report and possible engagement with the Expert Panels and the Chairs of Panels. The Chair noted that while the EPA's Report contains a range of issues associated with marine turtles and their management, any new or revised conditions arising from this report that might be added to those already in place, was yet to be determined.

##### Overview of LTMTMP Revision C & Incorporation of Comments

Chevron provided an overview of the key changes made to the LTMTMP (Rev C). The Chair solicited the Panel Members' initial comments. The Panel agreed there were a number of matters on which it needed to focus and these were: cumulative impacts, measurable limits, regional studies and prioritisation of studies.

##### Cumulative Risk

A sub-group of the Panel worked on developing a simplified matrix of the cumulative risks for turtles for each of its key life cycle stages. The Panel observed the Matrix was only a coarse assessment or way of considering cumulative impact on each life stage. It was agreed the cumulative risk matrix was a useful tool to testing the scoring of the risk assessment in the LTMTMP. The Panel agreed that the cumulative risk matrix created should be included as a supplement to the risk assessment tables already in the LTMTMP.

##### Regional Studies Framework

A sub-group of the Panel worked on an outline a framework for regional studies. The purpose of the framework was to identify the broader studies required to put the Barrow Island studies in context. Such regional studies may form part of the proposed North West Shelf Flatback Turtle Conservation Program and assist in determining which elements should be the Proponent's responsibility as part of their monitoring program at Barrow Island.

##### Measurable Limits, Trigger Levels & Statistical Power

Dr Chaloupka provided the Panel with a presentation on recent work undertaken in relation to addressing Ministerial Statement No. 748 Condition 16.4(6). The Panel entered into a lengthy discussion regarding the merits and challenges associated with applying a statistical power of 0.8. It was noted that the Condition did allow for an alternative to be considered and determined by the

Minister. Dr Chaloupka demonstrated the benefits and confidence that can be achieved through the application of control charts that use probability measures (standard deviations) over time to a range of parameters that could be used as management triggers.

#### Prioritisation of Research Studies

The Chair led the Panel through a process to prioritise the significant research subjects. The top 5 subjects that were chosen by the Panel overall were:

1. Foraging habitat and effects of dredging
2. Population studies, sampling design, key demographic parameters for monitoring
3. Hatchling survivorship, 'frenzy period', light impacts
4. Genetics (regional flatback turtle stock identification)
5. Beach temperatures among beaches, sex ratio

#### Revised Risk Assessment

Chevron provided a summary of Day 2 of the revised Risk Assessment Workshop. The output of the completed revised Risk Assessment Workshop is contained in the appendix of the LTMTMP and a summary of the output is contained in the LTMTMP text. It was noted that while there are generic risk assessment tables and processes available, the Proponent had use their own Corporate Project Risk Assessment Process.

#### Dredging Spoil Disposal Management and Monitoring Plan (DSDMMP)

Chevron's Marine Infrastructure Manager gave presentations to the Panel on the:

- 1) Dredge program, which included a visual 'flyover' of the proposed off-shore facilities (i.e. marine offloading facility (MOF) and Jetty
- 2) Turtle management measures that are proposed for the dredge program
- 3) Structure and content of the DSDMMP.

The DSDMMP (Rev C) is currently undergoing revision to address the comments of the Construction Dredging Environmental Expert Panel (CDEEP) and once these improvements have been incorporated the Plan will be provided to the MTEP for review prior to the next meeting. The Chair noted that he would write to the CDEEP Chair and provide him with a record of the MTEP observations in relation to their review of the DSDMMP.

#### Marine Facilities Construction Environment Management Plan (MFCEMP)

Chevron's Downstream Environmental Advisor also provided a brief presentation overview of the MFCEMP structure and content. It was noted that the structure was very similar to that of the DSDMMP and the MTEP was required to be consulted as a requirement of conditions contained in the Project's EPBC approval. It was noted that the rough surface of the MOF would likely create turtle habitat and encourage foraging. The Panel also discussed the various merits of different Reverse Osmosis (RO) brine outflow locations. It was noted that the brine may possibly create an unsuitable foraging area for turtles.

#### Coastal Stability Monitoring and Management Plan (CSMMP)

Chevron provided the Panel with an overview of the current status of the CSMMP and how initial comments had been incorporated to improve the document. The Panel provided observations on:

- monitoring beach profile during turtle nesting
- possible effects of climate change on turtle nesting and hatchling success

## Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF MEETING #7

**Date:** 14th & 15th July 2009, 9.00am to 5.00pm  
**Location:** QV1 Building  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #7  
**Attendees:** All panel members other than those for whom apologies are noted. Mr Billy Cash, Mr Shane Waldeck, Mr Matthew Rich and Ms Ursula Davies all from Chevron attended as guests.  
**Apologies:** Dr Julia Martin

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#### Long Term Marine Turtle Management Plan (LTMTMP)

##### Lighting Strategy

Chevron provided the Panel with a presentation on the Project's light management strategy. The presentation outlined the basis on which Chevron has developed their lighting management strategy and the wide range of measures proposed to reduce light spill from its terrestrial and offshore facilities and construction or operational activities. The objective of the Project's light management strategy is to reduce the impact to turtles from light spill whilst still meeting requirements, safety, operability and environmental protections.

Following the lighting presentation the Panel discussed at length the information presented and outlined their observations and advice to Chevron including where further information was required.

The Panel noted that light has been identified as a critical stressor on turtles and appreciated the efforts taken by Chevron to address impacts of lighting on marine turtles as demonstrated in their lighting management strategy and their Lighting Basis of Design.

The Panel made a number of specific suggestions and requested Chevron provide a written response to these by the next meeting.

##### Project Update

Chevron provided the Panel with a summary of critical Project milestones leading to the Project's final investment decision. This included Chevron's anticipated date of when the Minister may determine the appeals, release of the new Ministerial Statement and associated Conditions, and by when the Proponent was seeking to secure Ministerial approval of the various management plans.

#### Review of Response to Panel Comment and Revision of LTMTMP

The Chair advised that the Panel, having previously commented on the Plan's structure and key issues, should now be focused on 'polishing' the final document. Chevron provided the Panel with an explanation of their response to the key comments provided by the Panel in their review of revision C2 of the LTMTMP. After addressing the comments in the summary provided Chevron also provided an update on other key elements and changes in the LTMTMP. The Panel discussed at length a number of the matters raised.

##### Advice to Minister

The Chair led the Panel through a review and discussion on the purpose, scope, structure and content of the Advice to the Minister and Proponent. The purpose of the Advice is for the Panel to

fulfil its role as stipulated in Condition 15.2 of the Ministerial Statement, which requires the MTEP to provide advice on the LTMTMP, which at this stage can only be on its development.

**Dredging Spoil Disposal Management and Monitoring Plan (DSDMMP)**

Chevron provided the Panel with a presentation outlining Chevron’s response to the advice provided by the Panel at their last meeting, and the progress made on preparing revision D of the DSDMMP. The Panel had raised five matters for clarification of which Chevron provided a response on the first two; these being detection of turtles with impact areas and the prevention of impacts to turtles from marine vessels. While Chevron had considered the other matters they wished to complete discussion with the US Army Corp of Engineers before completing the advice.

Following the presentation and update provided by Chevron on the Marine Facilities Construction Environment Management Plan (MFCEMP) the Panel discussed at length the information presented and outlined their observations and advice to Chevron including where further information was required.

The Panel endorsed Chevron’s proposal to utilise Marine Fauna Observers (MFOs) to record observations of marine turtles in the vicinity of the dredging operations. The Panel also agreed that the proposed action of stopping the dredge when a MFO observes a marine turtle within 20m of the dredge is not warranted and should not form part of the operational procedures at this time.

**Marine Facilities Construction Environment Management Plan**

Panel members were provided with an update on the status of the MFCEMP.

Chevron advised that revision D of the MFCEMP will be issued once the revised conditions were known.

**Marine Turtle Expert Panel Members**

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member’s Role</b>	<b>Panel Member</b>	<b>Panel Member’s Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF MEETING #8

**Date:** 4th August 2009, 9.00am to 5.00pm  
**Location:** QV1 Building, Level 18 – Conference Room 18:20  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #8  
**Attendees:** All panel members other than those for whom apologies are noted.  
**Apologies:** Dr Stephanie Turner and Dr Col Limpus

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#### Appeal Process

Chevron Australia provided an update on what they understand to be the status and process to prepare and finalise the new State and Commonwealth Conditions of approval for the revised and expanded Project.

It was advised that the Minister has determined the appeals and has now directed the Appeals Convenor to proceed with preparing the new Conditions. These new Conditions will supersede the current conditions. The new Conditions will be based largely on Ministerial Statement No. 748.

#### **Long Term Marine Turtle Management Plan (LTMTMP)**

##### Revised Conditions Including Implications for the LTMTMP

Representatives from Chevron Australia and DEC provided the Panel with an explanation on what the changes to the current Ministerial Conditions, applicable to the LTMTMP and or of relevance to the MTEP, are being contemplated. In summary the key changes being proposed are minor edits to correct inconsistencies and ambiguities, reflect the intent of the Minister's appeal determination, and address recommendation, where appropriate, contained in the EPA's Report 1323.

#### Lighting Management

The Proponent representatives on the Panel provided an update on the suggestions provided by the Panel's in relation to the Project's lighting management strategy. Due to time constraints and that a number of the Panel members were participating via teleconference it was agreed that a more detailed update and explanation would be provided by the Proponent at the next MTEP meeting.

#### **Dredging Spoil Disposal Management and Monitoring Plan (DSDMMP)**

An overview of the engagement with the US Army Corp of Engineers (USACE), at which between Chevron Australia, DEC, DEWHA representatives were in attendance, was provided to the Panel. A series of three meetings was held with the USACE to exchange information on dredge management measures to reduce and detect impact to turtles. While the meetings have now concluded there will be further engagement via correspondence and a visit by USACE representatives in late September early October 2009. The focus areas covered during these meetings were design features and operating procedures, procedures to monitor mortality and entrainment of turtles, performance criteria to suspend TSHD dredging due to turtle mortality, and requirements for establishing and evaluating turtle protection methods used.

## Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF MEETING #9

**Date:** 14th August 2009, 9.00pm to 5.00pm  
**Location:** QV1 Building, Level 15 – Conference Room 15:32  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #9  
**Attendees:** All panel members other than those for whom apologies are noted. Mr Shane Waldeck from Chevron attended as a guest.  
**Apologies:** Dr Scott Whiting, Dr Julia Martin and Mr David Humphreys

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#### Review of Revised Conditions/New Ministerial Statement

At the last MTEP meeting the Panel was given an overview of the proposed draft conditions within Ministerial Statement No. 800. Since this meeting, the draft conditions have been finalised and take into consideration the comments provided by the Panel. An overview of the new Conditions relevant to marine turtles and the MTEP was provided.

#### Lighting Management

Following MTEP meeting #7 the MTEP wrote to Chevron Australia providing observations, recommendations and requesting further information on lighting, dredging and vessels in relation to turtles. Chevron Australia has prepared a response to the request for information and during this meeting presented these to the Panel. The responses have been prepared in consultation with the Project engineers, marine specialists, external consultants etc. who were given a directive from Senior Management to ensure a high level of consideration be given to the Panel's requests. The principals and measures taken to address the Panel's requests outlined during the meeting have also been incorporated into the Long Term Marine Turtle Management Plan (LTMTMP) where appropriate.

The MTEP had a discussion following Chevron's response to the MTEP's request for further information on lighting matters in relation to turtles, including:

- Responsibilities for ship safety and lighting in BWI Port
- Light spill modelling and minimisation of light spill from buildings
- Lighting of the MOF and Jetty

#### Review of LTMTMP (Rev E) and Panel Discussion

The MTEP received Rev E of the LTMTMP prior to the meeting. The Chair asked for the Panel to identify the main issues considered to be outstanding or requiring further clarification in the LTMTMP. Issues and observations were discussed by the MTEP, including:

- Monitoring parameters
- Scope of studies to be included in LTMTMP
- Potential effects of the MOF/Jetty on turtle behaviour
- Use of control charts, performance standards and management triggers

## Review and Revise Draft Panel Advice to Minister and Proponent

The Chair provided that Panel with a presentation on what is proposed for inclusion in the Advice to the Minister and Proponent and how the Advice will be structured to include all of the Conditions of Statement No. 800 that the MTEP is required to provide advice. The Panel reviewed the draft Advice and discussed the content in preparation for its finalisation. The Chair agreed to include the additional information discussed and circulate to the panel for their review prior to the next meeting. The Chair reiterated the need to finalise the Advice to the Minister and Proponent at the next Panel meeting.

## Dredging Spoil Disposal Management and Monitoring Plan (DSDMMP)

Chevron representatives provided the MTEP with an update on the engagement with the US Army Corp of Engineers (USACE). The engagement was held over three meetings scheduled on 21 July, 28 July and 4 August 2009. Further engagement is expected in the form of a visit by USACE representatives to the Gorgon Project at a later date. Chevron representatives understand that the USACE are supportive of an adaptive approach to managing the best procedures in preventing entrainment of turtles, rather than an approach that is set in stone. The DSDMMP has been updated to include the advice of the USACE and relevant recommendations to be implemented.

## Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL

### SUMMARY OF MEETING #10

**Date:** 27th August 2009, 9.00pm to 9.30pm  
**Location:** QV1 Building, Level 23 – Conference Room 23:05  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #10  
**Attendees:** All panel members other than those for whom apologies are noted. Mr Shane Waldeck from Chevron attended as a guest  
**Apologies:** Dr Scott Whiting, Dr Julia Martin and Dr Stephanie Turner

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The primary focus for this meeting was to complete a page-turn review of the penultimate revision of the Long Term Marine Turtle Management Plan (LTMTMP) to agree any final amendments and finalise the Advice to the Minister and Proponent.

#### **Commonwealth Government Approval and Conditions**

The Panel was provided with a copy of the Commonwealth Conditions of approval prior to the meeting for their review. A review of the Commonwealth Conditions showed that they were predominately a reflection of the State Ministerial Conditions (Statement No. 800) with some limited word changes and edits that do not alter the intention of the conditions. One key alteration was the removal of the requirement for the MTEP to review the Marine Facilities Construction Environmental Management Plan from the Commonwealth Conditions.

#### **Long Term Marine Turtle Management Plan**

##### **Final Review and Endorsement of LTMTMP**

The Chair led the Panel through a page-turn review of the entire Plan. The Panel engaged in extensive discussion as they moved through each section of the LTMTMP (Rev G), making agreed alterations as they progressed. The majority of the alterations were restricted to minor edits and captured by Chevron for inclusion into the final version of the Plan. There were a number of more substantive matters that were discussed at length before the final amendments were agreed.

Chevron Australia agreed to update the LTMTMP to address the key issues raised, as well as the other edits suggested during the meeting, in preparation for its submission to the Minister.

##### **Panel Advice to Minister and Proponent**

The Chair led the Panel through a review of the most recent revision of the draft Advice (rev C(2), dated 260809), which had been updated to reflect the various suggestions received from Panel members.

The Panel went through each key section and suggested further modifications and additions where necessary. A range of minor amendments were suggested and adopted by the Panel. Other key points were also discussed and agreement reached that these would need to be reflected in the final version of the Advice.

#### **Dredging and Spoil Disposal Management and Monitoring Plan (DSDMMP)**

Chevron's Downstream Environmental Advisor, Mr Waldeck, provided the Panel with an overview of the relevant section of the latest DSDMMP (Rev E) that dealt with marine turtles and their management associated with dredging and spoil disposal activities. The changes made to these sections to address the Panel's previous suggested improvements were highlighted. Key changes included the movement of all marine turtle related reporting matters to section 8.0 (Auditing,

Reporting and Review); and the movement of all marine turtle monitoring, including turtle entrainment and mortality, to section 7.0 (Monitoring Programs).

MTEP Advice on Condition 20.4 vi in Relation to the DSDMMP and Construction Dredging Environment Expert Panel's (CDEEP) Advice to the Minister and Proponent

The Chair discussed the letter received from CDEEP formally requesting the MTEP's advice on the relevant marine turtle matters contained in the DSDMMP. The Chair noted that, with the assistance of the Secretariat, he would provide the CDEEP with a formal response based on the Panel's discussion and recommendations.

Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL SUMMARY OF MEETING NO.11

**Date:** 8th and 9th December 2009, 9.00pm to 5.00pm  
**Location:** Perth, Chevron's Offices  
**Subject:** Gorgon Marine Turtle Expert Panel – Meeting #11  
**Attendees:** All panel members other than those for whom apologies are noted. Mr G Prior from Chevron attended as a guest presenter

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This was the first Panel meeting since the provision of formal advice on 4 September 2009 to the Minister and Proponent as to the adequacy of the Long term Marine Turtle Management Plan (LTMTMP). The focus of Meeting 11 was to receive an update from the Proponent on project progress, provide advice in relation to current and proposed marine turtle studies, and to discuss the required frequency and scope of future Panel meetings and their role during the next phase of project activities.

### Plans Requiring Ministerial Approval

The Panel received an explanation of errata made to the LTMTMP, Dredge and Spoil Disposal Management and Monitoring Plan (DSDMMP) and the Marine Facility Construction Environmental Management Plan (MFCEMP), subsequent to their submission to the Minister in early September 2009.

### Dredging Program

Chevron Australia provided the Panel with an update of the dredge program progress. The key points included: award of the dredge contract to Boskalis in September 2009; the sourcing of a Marine Construction Support Vessel that will accommodate up to 300 dredge workers and be moored approximately 8km to the east of the Island; and a revised date for the commencement of the dredge program.

The Panel was provided with a presentation on possible methods to exclude turtles from entrainment in the Trailer Suction Hopper Dredge (TSHD). These methods will be trialled prior to the commencement of TSH dredging. An overview of the design of overflow-screens that will be fitted to the TSHD to detect turtle entrainment was also provided. The MTEP endorsed these approaches.

The three methods of turtle exclusion identified for trialing include traversing over the area to be dredged with the TSHD prior to dredging, fitting drag chains to the suction line in front of the drag head, and fitting a water jet system to the suction line in front of the drag head. To oversee the trials Chevron proposed that a Technical Working Group, with representation from DEC, DEWHA, MTEP and CDEEP, be established to review the procedure, methodology and results, and provide on-board representation and advice on behalf of their respective body during the trials.

### Research and Monitoring of Turtles

Chevron Australia provided an overview of the LTMTMP state of implementation, which primary focused on the scheduled 2009/10 turtle season monitoring program and studies. The key points of observation and discussion included the tagging program on Barrow Island and Mundabullangana; with this season being the first time the tagging program at Mundabullangana has been run for 2 months.

Advice was sought from the MTEP on the Proponent's proposed hatchling in-water dispersal and survivorship studies, with a range of suggestions provided for Chevron's consideration. The Panel recommended a pilot study first be undertaken to confirm and refine the methodology and equipment need to undertake a more extensive study. Testing the methodology does not necessarily need to be held at Barrow Island.

Coastal Stability Management and Monitoring Program

The Panel was also provided with an overview on the status of the Coastal Stability Management and Monitoring Plan (CSMMP), and specifically the Supplement containing information on proposed management triggers. The MTEP will be kept informed of progress and comments or suggestions for improvement will be sought as required.

Effectiveness of the MTEP

The Chair led a discussion with Members as to their individual view, as well as the Panel's collective view, as to the effectiveness of the MTEP during the last 12 months. The Members' respective views were exchanged and key lessons learnt by the Panel captured. In summary the Panel viewed the MTEP as having been effective in adding value to the development of the LTMTMP. A more formal review of the contribution and function of the three expert panels for this project is proposed in 2010.

Future Role and Meetings

The role of the Panel over the next few years is now expected to focus on implementation of the LTMTMP with a particular emphasis on dredging and lighting strategies and on research and monitoring studies and results. The Panel agreed to meet on a quarterly basis, with their next meeting scheduled for late March 2010.

Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL SUMMARY OF MEETING NO.12

**Date:** 25th March 2010, 9.00pm to 6.00pm  
**Location:** Perth, Chevron's Offices  
**Subject:** Gorgon Marine Turtle Expert Panel – Meeting #12  
**Attendees:** Panel members and alternates, less those unavailable  
Mr G Prior and Mr S Waldeck from Chevron attended as a guest presenters

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The meeting was reduced to one day due to the delay in the flights and subsequent arrival of members from Townsville and Brisbane.

### Update and Panel Discussion on the LTMTMP Implementation

An update was provided on the implementation of the Long Term Marine Turtle Management and Monitoring Plan (LTMTMP) to date. A key point raised with the Panel was the Proponent's commitments in the LTMTMP to review the scope of studies, monitoring program and risk assessment 12 months after approval of the Plan.

Chevron Australia advised that the first season of the monitoring program described in the LTMTMP has been completed. Following the completion of the season the data are now being analysed and will be presented to the Panel at the June meeting. It was agreed that for the MTEP to be able to adequately report on the implementation of the LTMTMP the Panel will require sufficient information on the results from the first season of the monitoring program to enable them to develop its advice during the September meeting.

### Update on Lighting Strategy Implementation

Chevron Australia provided an overview of the Project's lighting compliance assurance process. The process is used to verify that lighting installed on site is consistent with Ministerial conditions, the Lighting Basis of Design, Proponent commitments and is being implemented appropriately. It was noted that there have been some instances where contractors had installed facilities that were inconsistent with certain specifications. These inconsistencies were being identified through routine inspections and addressed.

The MTEP discussed at length the Project's lighting compliance assurance process. It was noted that there are two main elements to this process, which are:

1. determination of whether construction is being undertaken in accordance with the conditions of approval and the LTMTMP commitments; and
2. performance and outcome of monitoring results (i.e. have turtles been affected by light?).

The Panel recommended that annual lighting audits be undertaken, and a high level of compliance achieved, prior to the critical timeframe of each turtle nesting season. Similarly, a higher frequency of inspections should occur during turtle nesting and hatchling periods.

### Turtle Exclusion Trials

Chevron Australia gave a presentation on the proposed turtle exclusion trials. The trials proposed include three possible exclusion methods, which are:

- A. Method A: Traverse over the area to be dredged with the TSHD
- B. Method B: Fit drag chains to the trailing pipe in front of the drag head
- C. Method C: Fit water jet system to the trailing pipe in front of the drag head

The Panel held extensive discussion regarding the trials. They recognised that the trial results would be subjective as there is expected to be insufficient turtles to provide statistically robust data due to the timing outside the nesting season; for the MTEP noted that these trials were important to collect evidence to support the effectiveness of these methods on turtle behaviour. It was noted that other management strategies such as marine fauna observers, overflow screens, stranding observations etc would apply from the commencement of the dredge program.

It was agreed that the nominated MTEP representatives on the trials should have the authority to provide advice to Chevron Australia on behalf of the Panel. The representatives would then table the results to the Panel at the next meeting for its information and discussion before formal advice to Chevron.

### Overview and Discussion on Turtle Event Reporting and Response Protocol

Chevron Australia gave an overview of the marine turtle event reporting and response protocol. The reporting protocols were talked through and some further enhancements suggested. Chevron Australia agreed to take into consideration the feedback provided by the Panel and revise/expand the protocol as appropriate. Panel members agreed to provide any additional guidelines on euthanasia procedures and the recognised (6) standard stages of decomposition.

It was suggested that the Department of Environment and Conservation representatives on Barrow Island should be kept informed whenever a turtle is discovered, and to participate in any decisions on the welfare of the turtle. This would be in addition to the formal reporting of any project-attributable marine turtle events to the relevant authorities.

The Panel also suggested that Chevron Australia could explore possible relationships with Western Australian universities who offer a veterinary program to participate in responding should there be a marine turtle event.

### Future Requirements for Advice

The Chair and Secretariat agreed to develop a draft Table of Contents/Framework of the Panel's advice after 12 months for agreement at the next meeting. The Chair and Secretariat will develop a list of standing items that will be on the agenda for all future meetings. It was suggested that the agenda identify whether each item is for MTEP information, review, or advice.

### Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL SUMMARY OF MEETING NO.13

**Date:** 22<sup>nd</sup> & 23<sup>rd</sup> June 2010  
**Location:** Perth, Chevron's Offices  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #13  
**Attendees:** All Panel members other than those for whom apologies are noted.  
**Apologies:** Dr Julia Martin, Mr Keith Morris (Day 1 Only), Mr David Humphreys, Dr Stephanie Turner  
**Guests:** Mr Geoff Prior – Chevron Australia, Dr Catherine Bell – Pendoley Environmental, Mr Paul Whittock – Pendoley Environmental, Dr Jessica Oates – Pendoley Environmental

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### Long Term Marine Turtle Plan Implementation (LTMTMP)

Chevron Australia tabled a proposed amendment to the LTMTMP to allow more flexibility in the choice of appropriate lighting on Barrow Island while maintaining or improving environmental standards. The MTEP agreed to support the proposed amendment on the basis that it sought to maintain or improve environmental standards and outcomes intended in the current LTMTMP, subject to receipt of additional advice.

### Framework of MTEP Advice on LTMTMP Implementations

MTEP agreed with the proposed outline of the report to the Minister and the Proponent, addressing the components of Condition 16 of Ministerial Statement No.800. The Report is to be annual, covering the period August to July inclusive of the previous year (consistent with the Environmental Performance Report by Chevron), and submitted in November each year. The Report is to be succinct and technical, and based particularly on monitoring and research reports for the period under review.

### Turtle Exclusion Methods Dredge Trials

MTEP endorsed the report of the MTEP representatives at the trials, as amended and recommended that Chevron Australia should:

- Record all fauna and other biological material found in the overflow screens, as further information about the effectiveness of the screens;
- Ensure that the procedures for the overflow screens maximise the opportunity for detection of turtle remains; and
- As far as possible record environmental conditions at the time of dredging to help set the environmental context for any entrainment events

The MTEP noted that the trials could best be regarded as a pilot study rather than a statistical sampling procedure and that the coming 2010-11 nesting season will be a further test of the turtle exclusion method. MTEP also noted that the use of water jets (Method C) may compromise the intentions in the DSDMMP in relation to maintaining environmental water quality for coral health.

### Monitoring Program Results

The MTEP received detailed presentations on the results of monitoring from the past 5 years and including the 2009-10 nesting season at Barrow Island and Mundabullangana (Munda). Very detailed information was given with discussions following each presentation.

The MTEP agreed to finalise its comments on the 2009-10 monitoring season results and to complete its advice on any adjustments to the monitoring program for the 2010-11 nesting season at the September meeting.

Reporting on the LTMTMP Implementation and Effectiveness

Chevron Australia provided an update on changes to the Incident Reporting Protocol. The MTEP recommended that as far as possible that biological samples be collected from live, injured or recently deceased turtles, for information on disease and other factors, Live injured turtles that have been rehabilitated/treated and released should be tagged in case of subsequent mortality or recovery, Appropriate non-expert people should be trained in basic tissue sample collection techniques, and procedures to be established for the collection of samples from strandings.

Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL SUMMARY OF MEETING NO.14

**Date:** 2<sup>nd</sup> & 3<sup>rd</sup> September 2010  
**Location:** Mineral House, Brisbane QLD  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #14  
**Attendees:** All Panel members other than those for whom apologies are noted.  
**Apologies:** Dr Julia Martin, Dr Mark Hamann (2<sup>nd</sup> Sept), Dr Stephanie Turner  
**Guests:** Dr Milani Chaloupka (3<sup>rd</sup> Sept)

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### Update on Project Progress

Chevron Australia provided an update on the Project progress, and showed a video highlighting the work being done at Barrow Island. The following were the key points of discussion:

- Approximately 1000 Gorgon workers on Barrow Island.
- Land clearing and earthworks associated with the LNG Plant are underway.
- Work at the construction village continues.
- Site works for the horizontal drilling have commenced.
- Dredging continues on target and water quality issues have dropped away due to better weather.
- The construction of the causeway out from Town Point has commenced.

### Long Term Marine Turtle Plan Implementation

Chevron Australia led a discussion into the implementation of the Long Term Marine Turtle Management Plan (LTMTMP).

The Panel's recommendation that Chevron Australia consider investigating the development of:

1. a GIS referenced digital map of the Gorgon light sources from permanent buildings
2. digital aerial images of the night sky over BWI
3. an inventory of light sources on BWI

that could provide additional sources of information to that provided by SkyCam to enable an improved understanding of the effects of lighting on turtle behaviour and survival.

The Panel noted the preliminary audit of compliance with lighting design requirements and supported Chevron Australia's ongoing efforts at continuous improvement, recognising that the effects of lighting on turtles is unlikely to be known for some time.

### Turtle Events

The Panel discussed the recording and reporting of turtle strandings on Barrow Island and advised the importance of recording 'zero strandings' when checking beaches.

### Performance Reporting

Chevron Australia provided an overview of the Annual Environmental Performance Reporting obligations. The annual Performance Report covers a period from August to August each year and is required to be submitted in November. At this time it will also be provided to MTEP for information.

## Monitoring Program Results

The Panel considered the proposed monitoring program for the coming nesting season 2010/2011 proposed by Chevron Australia and supported the proposed changes with the exception of laparoscopy to determine first time breeders. The following monitoring parameters planned for 2010/2011 were considered essential:

- Population estimates and demography (tagging)
- Hatchling fan angles
- Light monitoring
- Nest success
- Satellite tagging
- Track census
- Beach temperatures
- Noise and vibration

## Panel Feedback on the 2010/12 season monitoring reports

The MTEP commended Chevron Australia and Pendoley Consultants on the technical quality and detail in the reports. The Panel made the following key comments in discussions on the technical reports:

- Baseline light monitoring studies – this is innovative and of potential importance worldwide. MTEP strongly recommends that the methodology be published in a peer-reviewed journal.
- Satellite tracking – care is needed when interpreting behaviour, such as ‘foraging or resting’ from U-shaped dive profiles, without independent corroborating evidence.
- Track Census – care is needed when interpreting an ‘increase/decline in tracks’ as evidence of ‘increase/decline in populations’. A pre-construction baseline is necessary to detect any Project-attributable changes post-construction.
- References to monitoring seasons – MTEP recommended that Chevron Australia settle on one description for the nesting season on which reports were based.
- Hatchling fan angle – MTEP recommended that the methodology be published in a peer-reviewed journal.
- Noise and vibration – MTEP noted the uncertainty surrounding this parameter and the difficulty of establishing a pre-construction baseline level of noise and vibration that was relevant to turtles. MTEP recommended that a literature search might reveal studies on this effect.
- Tagging studies – MTEP recommended that as many beaches as possible be utilized for tagging studies, in order to understand any population changes that might result from construction of the Marine Offloading Facility and Jetty. MTEP also recommended that the beaches used for fan angles and lighting studies should be the same beaches.
- Laparoscopy was considered desirable but not essential and given the amount of other monitoring effort required, could be deferred to a later season (noting that recruitment is able to be monitored via the tagging program) as a measure to validate tagging studies.
- Pivotal beach temperatures at Barrow Island and Mundabullangana – MTEP considered this parameter as critical but not time dependent and could be deferred until the operational phase of the project.
- Beach predation - MTEP discussed the possibility that major predators on turtle eggs and hatchlings (e.g. from perenties) may be displaced from the Gorgon construction area and, if so, whether this may cause an increase in predation on turtle eggs and

hatchlings on the eastern beaches of Barrow Island. This was not identified as an additional risk factor; however, if it became one further studies on predation may be needed.

- Hatchling dispersal in water – MTEP considered that the study undertaken in 2010 needed extra data on turtle behaviour and hydrodynamic modelling to understand better the survivorship before and after the Materials Offloading Facility has been built.
- Effects of light spill from vessels on hatchling dispersal. MTEP endorsed this as an initial study.
- Genetic studies – it was acknowledged that such studies would be difficult to be undertaken as part of the Gorgon monitoring program, but might be suitable for the proposed North West Shelf Turtle Conservation Program being developed between Chevron Australia and DEC.

### Control Chart Parameters

The MTEP reviewed the monitoring parameters that should be expressed in control charts, in the light of expert advice. The following parameters were agreed as appropriate for expression in control charts:

- Adult survival rate (female)
- Adult female breeding probability (breeding omission)
- Annual nester abundance (tagging)
- Clutch frequency (mean number of clutches per nesting female per season)
- Egg hatching rate
- Hatchling emergence
- Hatchling disorientation
- Hatchling mis-orientation
- Nesting beach abundance (track count index)
- Beach sand temperatures

MTEP members agreed after discussion that the following monitoring parameters, although important, could not or were inappropriate for expression in control charts:

- Hatchling sex ratio- once the pivotal temperature is known, then beach sand temperature estimate of bias can be made
- First time breeders – important parameter but can't be used as a control chart
- Re-nesting interval
- Re-migration interval
- Growth rates
- Tag retention
- Evidence of disease
- Cause specific strandings
- Sea parameters (sea water temperature, tidal change)
- Dredge impacts (entrainments)
- Lighting level
- Incubation period of clutches
- Clutch size
- Egg size and weight
- Hatchling size and weight
- Beach erosion or accretion at beaches either side of Town Point

- Noise levels
- Vibration on beaches either side of Town Point
- pH TOC (CSMMP)
- Moisture content and grain size distribution (CSMMP)
- Hatchling swimming direction
- Hatchling survivorship
- Air temperature
- Rainfall

### Scope of Studies

MTEP reviewed the scope of studies as required by the LTMTMP and agreed the need to adjust the scope and timing of research studies, as shown below:

Table 2: Priority of Ecological Research Studies for Marine Turtles for the period 2009/10–2013/14

Research Area	Season				
	09/10	10/11	11/12	12/13	13/14
Studies on foraging turtles off Barrow Island.	Postpone to Operations Phase				
Survivorship of Flatback hatchlings during the in-water frenzy period off Barrow Island beaches	√	√	Postpone to Operations Phase		
Hatchling dispersal off Barrow Island (hydrodynamic modelling)			√		
Hatchling response to light pools off vessels		√	*	*	*
Phylogeographic distribution of the Flatback Turtle stock that uses Barrow Island.	Postpone to Operations Phase				
Population abundance of nesting Flatback females at Barrow Island and at Mundabullangana.	√	annual monitoring program			
Beach sand temperatures for both BWI and Mundabullangana	√	annual monitoring program			
Baseline state of pollutants in beaches	√				

\* Study may or may not proceed in this season dependant upon results from previous season

### General Business

Chevron Australia advised the MTEP that it had been awarded an APPEA award for excellence in innovation and environmental management at a recent APPEA environment conference, held in Brisbane, for the involvement of community volunteers in its marine turtle monitoring program, managed by Chevron Australia and Pendoley Environmental.

## Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL SUMMARY OF MEETING NO.15

**Date:** 25<sup>th</sup> September 2010  
**Location:** Dynon's Plaza, 905 Hay Street, Perth – Level 2 Jansz Room  
**Subject:** Gorgon Marine Turtle Expert Panel (MTEP) – Meeting #15  
**Attendees:** All Panel members other than those for whom apologies are noted.  
**Apologies:** Dr Scott Whiting, Mr David Humphreys, Dr Mark Hamann

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### Update on Project Progress

Chevron Australia showed the latest project progress video and recent site photos to the MTEP. The following were key points of discussion:

- The Barrow Island Fly Camp now holds 600 people, while the Marine Construction Support Vessel is running at capacity, with 400 people. There are 1200 people in total on Barrow Island.
- There are approximately 70 vessels on contract and operating in the Barrow Island Port.
- Due to bedding capacity there has been some challenges securing accommodation for turtle taggers but this has been managed through strong management support.

### Long Term Marine Turtle Management Plan (LTMTMP) Implementation

#### Strandings Database

Chevron Australia advised that the current recording of strandings, including skeletal remains, was opportunistic. MTEP supports the work done in developing a strandings database and discussed how the strandings records could be used in conjunction with track census data to provide some measure of change over time.

#### Hatchling mortality management trigger clarification

The Panel discussed the need for clarification around possible mass mortality events involving hatchlings that could be proposal-attributed. Currently the Long Term Marine Turtle Management Plan (LTMTMP) Section 10.4.4.2 excludes hatchlings from the trigger level responses in the Plan but includes the requirement to investigate the cause or causes of proposal-related incidents involving hatchlings on a case by case basis.

It was agreed that groups of hatchlings should be the unit of measurement for proposal-related incidents involving hatchlings. The Panel also noted that hatchling mortality/injury is reportable to both Department of Environment and Conservation (DEC) and Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) as part of the usual protocols for reporting such incidents.

Chevron Australia undertook to develop or revise Standard Operating Procedures (SOP) and/or flow charts to clarify management response mechanisms for hatchling events, and advise the MTEP accordingly.

#### Lighting

The Panel received an update on progress in the use of the SkyCam for monitoring light horizons during construction. It was noted light emissions were recorded coming from construction site activities, despite the lighting controls contained in the Lighting Basis of Design and LTMTMP being implemented. The Panel discussed the need for contingency plans in the event that

hatchlings from the coming nesting season were affected by on-island construction and/or vessel lighting.

The Panel recommended that Chevron Australia develop a Standard Operating Procedure and/or flow chart for hatchlings to be implemented in the event of potential misorientation/disorientation and mortality from the effects of artificial light horizons.

In the event that lighting effects from construction activities on Barrow Island and surrounding waters may significantly affect the behaviour of hatchlings (increased misorientation, disorientation and predation) in the coming nesting season 2010/11, MTEP recommends that Chevron review plans and response options for such an eventuality, including collection methods (e.g. beach netting, enclosures) and release of hatchlings at other appropriate beaches.

In relation to the potential effects of artificial lighting on adult nesting females, it was suggested that observations be made on return tracks for possible lighting effects on behaviour. However, it was noted that it would be difficult to determine a return track that indicated misorientation due to lighting effects.

#### Status of turtle programs for 2010/2011 season

The Panel was advised of green turtles nesting immediately adjacent to the HDD construction site on the west coast of Barrow Island, and the likelihood of misorientation/disorientation of hatchlings on emergence due to artificial lighting. The Panel discussed various options to deal with this likely effect on hatchlings, which included:

- Close construction activities for the period of hatchling emergence
- Cage and collect hatchlings on emergence for release on beach not affected by artificial light (would require 24 hour presence of staff during likely emergence time)
- Relocate clutch to safe suitable beach for incubation (would need to be done after four weeks from egg laying)

#### Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

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Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Scott Whiting	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEWHA	Dr Kirstin Dobbs	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Proponent Representative	Mr Russell Lagdon	Dr Julia Martin
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL SUMMARY OF MEETING NO.16

**Date:** 4<sup>th</sup> and 5<sup>th</sup> May 2011  
**Location:** Museum and Art Galleries of the NT, Darwin  
**Subject:** Gorgon Marine Turtle Expert Panel – Meeting #16  
**Attendees:** All Panel members other than those for whom apologies are noted.  
**Apologies:** Mr Keith Morris, Dr Stephanie Turner, Dr Peter Landman

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### Project Progress Update

The Panel was briefed on the proposed expansion of the Gorgon Project, which includes the addition of a fourth LNG train and LNG Tanker movements, and discussed the potential additional risks to the population viability of marine turtles on and around Barrow Island. The main additional risks that Chevron Australia would need to consider were seen as:

- an increase in impacts on turtles that utilize the east coast of Barrow Island from lighting and vessel movements arising from an increase in LNG shipping traffic from an estimated 230-240 vessels per annum to 300-310 per annum

### Update on Other Project Matters

The Panel was advised of various proposed changes to the approved proposal. Of most interest to the Panel was the proposal to expand accommodation for the construction force on Barrow Island by the mooring of a temporary Causeway Construction Support Vessel (CCSV) adjacent to the causeway, approximately 750m from shore.

The MTEP noted the potential for impacts, particularly light emissions, from the CCSV on high-density nesting beaches adjacent to the causeway, and that the management of the impacts of such emissions on nesting females and hatchlings will be important.

### Marine Turtle Events

Chevron Australia presented an update on marine turtle events and the development of a database within to record, and report on, turtle events both natural and project-related. It was agreed that a review of this marine turtle events database should be standing agenda item at each meeting. It was noted during the meeting that not all marine turtle and hatchling events had been captured in the current version of the marine turtle events database presented and further work is required.

### Update to Long Term Marine Turtle Management Plan (LTMTMP)

Chevron Australia provided a review of proposed changes to the LTMTMP, which include the incorporation of the past errata, provision for improved flexibility in choice of lighting, reference to the CCSV, changes to scopes of studies, wording changes to improve legal compliance but not change the outcome of a commitment, and inclusion of updated definition of 'post-hatchling' etc. The MTEP would be provided with an opportunity to review the updated revision before it is submitted to the Minister for approval.

## 2010/2011 Marine Turtle Monitoring Program Preliminary Results

Preliminary results of the 2010-11 monitoring program were presented. The main findings were:

- Cyclonic activity had effected the monitoring program and data recovery
- Annual nesting populations were within the baseline mean
- Mean clutch frequency was significantly lower than in previous seasons
- Hatch success, emergence success and clutch size were all within the baseline mean for Barrow Island. There is no data on nest success available for Mundabullangana due to rain restricting access to the beach by field personnel
- Temperature loggers (both in nests and controls) have not been collected from Mundabullangana due to access restrictions due to weather
- Only one satellite tagged interesting turtle from a sample of 14 travelled to the mainland in contrast to previous years
- Internesting flatback turtles appeared to be utilising the newly dredged channel for the Materials Offloading Facility (MOF) and LNG jetty, with no apparent mortality
- There was no significant change in track census counts from previous years for both green and flatback turtles
- A few hatchlings were observed in light pools around vessels
- Beach sand temperature monitoring data has yet to be collected for the 2010/2011 season
- Quantification of artificial light using the SkyCam equipment is underway and will be reported on this season.

The MTEP made the following observations and suggestions:

- It would be useful to correlate night vessel operations in February with observations of onshore nest emergence
- Beach sand temperature is now recorded year round whereas the reporting period for past beach sand temperature has been October to March
- Research studies are needed to develop a pivotal sand temperature for Barrow Island to predict sex ratios from nests, though this is not needed immediately if other time critical research and monitoring programs are required (i.e. dispersal of hatchlings) as once pivotal temperature is established sex ratio's can be backdated in time using sand temperature monitoring data.
- Nest temperature profiles should be measured for nests in selected beaches using temperature loggers at both the current 50cm depth and at 70cm depth
- Dredge movements should be correlated with satellite tracks of flatback turtles in the coming (2011/2012) nesting season.

## Data Continuity and Analysis

The Panel discussed the effects of the disrupted monitoring program in 2010/2011 on data collection and the implications of data gaps for the integrity of data sets, control charts and action triggers. The Panel also canvassed the implications of possible interrupted data collection for the 2011/2012 season, and subsequent seasons. It was agreed that specialist advice should be sought on the implications of gaps in data sets for key control chart parameters, and the priorities for data collection in the event that monitoring programs are disrupted.

The Panel agreed to reconsider the implications of disrupted data collection and any prioritization and resourcing issues at its next meeting.

## Future Meetings

The Panel agreed to meet in Perth for its scheduled August meeting. The primary focus of this meeting would be on the final results of the 2010/2011 monitoring program, the implications of data gaps, the monitoring requirements and priorities for the 2011/2012 season, and explore further the issue of cumulative impacts.

## Marine Turtle Expert Panel Members

The Panel were advised of Dr Whiting's resignation from the Panel as an Independent Expert for future meetings. Dr Whiting has accepted a position with the WA Department of Environment and Conservation as Principle Marine Scientist and will replace Mr Keith Morris as DEC's primary representative.

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Col Limpus	
Independent Expert	Dr Scott Whiting	
Agency Subject Matter Expert - DEC	Mr Keith Morris	Mr Kevin Crane
Agency Subject Matter Expert - SEWPaC	Dr Kirstin Dobbs	
Proponent Representative	Mr Russell Lagdon	Dr Peter Landman
Proponent Representative	Dr Dorian Moro	Dr Stephanie Turner
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL SUMMARY OF MEETING NO.17

**Date:** 4<sup>th</sup> and 5<sup>th</sup> May 2011  
**Location:** Museum and Art Galleries of the NT, Darwin  
**Subject:** Gorgon Marine Turtle Expert Panel – Meeting #17  
**Attendees:** All Panel members other than those for whom apologies are noted.  
**Apologies:** Dr Col Limpus, Dr Peter Landman

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The Panel toured the Gorgon Project key work areas on Barrow Island and other areas of interest.

The Chairperson and Panel members expressed their appreciation of the opportunity to visit Barrow Island, to see first-hand the current stage of construction and to meet key Chevron personnel and contractors involved in the construction project as well as Department of Environment and Conservation (DEC) staff. The Panel was very impressed with the culture of environmental stewardship that has been developed on Barrow Island and the willingness of those involved to promote behaviour that continues and strengthens that culture. The visit also allowed a much better appreciation of the scale and complexity and effort that is required to successfully deliver the monitoring program each year.

### Project Progress Update

Chevron Australia provided the Panel with an update on project progress; including:

- Project activities (including video)
- Dredging and Spoil Disposal activities
- Overview of the Domgas Pipeline Installation Management Plan
- Update on the Gorgon Expansion Project (Train 4)
- Overview of the Causeway Construction Support Vessel (CCSV)

### Marine Turtle Events

The MTEP was briefed on current progress in the detection and identification of turtle deaths and in the development of the strandings database. The MTEP strongly supported the suggestion of additional training for on-island staff (Chevron Australia and DEC) in identification and recording of turtle carcasses. The MTEP also recommended that Chevron Australia utilise external expertise for assistance in the identification on carcasses and causes of death if necessary. Such expertise could be found from within the MTEP membership or elsewhere.

Where the cause of death was unknown or disputed between on-island staff, MTEP members supported Chevron Australia seeking advice initially from Dr Pendoley as is currently done. If further advice is needed then the MTEP recommended that such advice be sought from other MTEP members or external experts. It was noted that photographic evidence is particularly important for identification, and the opportunistic use of cameras by on-island staff was strongly supported.

The MTEP supported the proposal to develop protocols and training packages for necropsy and mortality identification, involving Chevron Australia and DEC staff as well as WA universities such as Murdoch School of Veterinary Sciences.

## Update to Long Term Marine Turtle Management Plan (LTMTMP)

Members were briefed on the status of proposed amendments to the LTMTMP Rev1B and advised that if there were any further comments they should be provided to Chevron Australia.

The MTEP discussed the proposed amendment to Section 7.5.1 that expands on the 'force majeure' provisions and the possibility of extreme or unplanned events (e.g. cyclones) disrupting monitoring. Such events may compromise the ability of Chevron Australia to demonstrate compliance with Ministerial approvals, because of reduced collection of monitoring data. The MTEP suggested that the reduction in monitoring data collection caused by extreme events, would better be handled through adjustments to the monitoring program, rather than amendments to the LTMTMP. If the proposed wording is to be retained, then it would be advisable to describe what action Chevron Australia would propose to take in the event of disruptions.

## 2010/2011 Marine Turtle Monitoring Program Preliminary Results

Detailed technical reports of monitoring results from the 2010/2011 nesting season had been provided before the meeting. A summary of the results was presented and each parameter was discussed, with assistance from Dr Milani Chaloupka. In brief the monitoring results show that:

- remigration of nesting Flatback females at Barrow Island is ~87%
- the Flatback rookeries are stable
- the key parameter is the adult survival rate, which indicates a healthy Flatback population and is consistent with the trends for healthy populations of other long-lived animals. Any marked deviation of trends for this parameter will be a cause for significant concern
- there was no significant variation in hatching and emergence success
- the tables of track census program results should use consistent vertical scale for comparison between years
- track counts are a useful additional measure of abundance but because they are opportunistic do not take account of detection variability
- the 2km radius used to define the scope of the program should be justified, or alternatively use specific beaches either side of Town Point
- the integration of fan angle graphics and light profiles from SkyCam for particular beaches in graphic form was particularly useful in understanding the hatchling survival and orientation data
- light spill from island activities during the 2010/2011 season showed no apparent affect on hatchling survival and orientation
- the observations of hatchlings in light pools from ships reported at last meeting should be included in the database and factored in to the monitoring results for the season
- mean clutch frequency dropped significantly ( $>-2.5$  SD) although numbers of nesting females remained stable. Possible reasons for this were canvassed e.g. reduction in energy available for egg production due to cyclonic activity, more neophyte nesters than experienced nesters sampled.

MTEP members were advised by Dr Chaloupka that the loss of data in 2010/11, because of cyclonic weather and consequent demobilisation of monitoring teams, was not significant because of the existing 5-year baseline for Barrow Island parameters and the robust sampling design. Data not collected at Mundabullangana during the 2010/2011 season is not significant for current analyses, although the establishment of a baseline may take longer. However, any future loss of data through similar extreme events will require review of control chart results. Also, the loss of

data could generate anomalous data points on control charts that trigger Alert/Review/Action responses.

In relation to the 2011/2012 nesting season, the MTEP supported the continuation of the current program design and effort with the following additional suggestions:

1. The lack of a good baseline pre-construction of hatchling dispersal and survivorship from beaches adjacent to the MOF was noted. The MTEP recommended that high priority be given to the following projects in the coming year:
  - monitoring the behaviour of hatchlings emerging on beaches adjacent to the MOF/Jetty
  - repeating trials of hatchling dispersal and survivorship during the 'frenzy' period in order to better understand the effect of the MOF on hatchling dispersal and survivorship,
  - understanding the effects of 'light pools' from the causeway, MOF and vessels on hatchling behaviour
2. The determination of a pivotal temperature for Barrow Island turtles should be attempted in the coming year, but not at the expense of the approved monitoring or research programs. This measurement will assist in the interpretation of sand temperature data as it relates to sex ratios of hatchlings.
3. A review of the hydrodynamic models developed to predict the effects of the MOF on tidal movement and currents should be undertaken to determine whether there is any change in the inshore hydrodynamic regime around the MOF and whether this has any influence on hatchling behaviour and survival.
4. A synthesis of monitoring results that integrates control chart measures and other parameters would be very useful as a communication tool at a variety of levels from Ministers to on-island DEC staff. This could be included in the Annual Performance Report by Chevron Australia and the Implementation Report by MTEP.
5. Each control chart could identify other control chart parameters that link to it so that when an Alert/Review/Action response is triggered, related factors that may have contributed to the trigger value could be examined simultaneously.
6. Existing data should be re-analysed to determine whether the drop in clutch frequency could be attributed to a disproportionate number of neophyte nesters than experienced nesters at the time of the disruptions to nesting by cyclones. Further analysis of the data would be useful to generate a ratio of neophyte to experienced nesters, examine whether there is a different clutch frequency between the two categories and the nest success of neophytes. The use of ultrasound was suggested as a way of determining whether nesting females with low nesting success had further clutches to lay.
7. The MTEP were supportive of the proposal to conduct additional track counts of Hawksbill turtles on selected north-eastern and northern beaches in October, providing this effort did not detract from the core monitoring effort. It was suggested that this be trialled for one season and then reviewed.
8. The proposal discussed at the previous meeting to measure beach sand temperature in nests at both 50cm and at 70cm (for incubation success) was reaffirmed. Each beach measured should have temperatures measured at both depths for control purposes.
9. The MTEP did not support the proposal for additional fine-scale satellite tracking using an Accelerometer to detect diving behaviour during the current capital dredging, which is due to conclude in October 2011.
10. Continuation of light monitoring using SkyCam was strongly supported with the suggestion that two cameras be deployed in tandem and mounted on suitable fixed structures on selected beaches. The MTEP again urged that this cutting edge methodology be published in the scientific literature as a contribution to the international literature on better methods for understanding turtle behaviour and conservation.
11. Satellite tracking of internesting females was providing excellent data and should be continued with a robust sample size during construction. The MTEP noted that the numbers tagged had

dropped from 20 in 2009/10 to 6 proposed for 2011/12 and that further loss of tags could compromise the data set.

The MTEP members acknowledged the huge effort by Dr Pendoley and her staff, and other Chevron staff, required to carry out the monitoring program in difficult circumstances. The program is world class and the reports are of high standard and informative. The provision of reports ahead of meetings is much appreciated and allows more time for considered discussion at the meetings.

### Future Meetings

The Panel agreed to meet in Townsville for its scheduled November meeting. The primary focus of this meeting would be on the final results of the 2010/2011 monitoring program, the implications of data gaps, discuss the monitoring requirements and priorities for the 2011/2012 season and explore further the issue of cumulative impacts.

### Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEC	Dr Scott Whiting	Mr Kevin Crane
Agency Subject Matter Expert - SEWPaC	Dr Kirstin Dobbs	
Proponent Representative	Mr Russell Lagdon	Dr Peter Landman
Proponent Representative	Dr Dorian Moro	
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL SUMMARY OF MEETING NO.18

**Date:** 15<sup>th</sup>-16<sup>th</sup> November 2011  
**Location:** Townsville, Queensland  
**Subject:** Gorgon Marine Turtle Expert Panel – Meeting #18  
**Attendees:** All Panel members other than those for whom apologies are noted.  
**Apologies:** Dr Col Limpus

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### Project Progress Update

Chevron Australia provided the Panel with an update on project progress; including:

- The viewing of the September-October 2011 Project progress video, which provide aerial footage of key project construction activities and highlights
- The completion of dredging, which finished 7 November 2011. It was noted that the perceived level of interaction between turtles and dredging were less than thought likely
- Chevron Australia noted that it anticipated very little need to undertaken maintenance dredging based on its modelling due to the low levels of localised sand available for re-suspensions/mobilisation but this would need to be confirmed in the future
- Post-development marine monitoring has commenced and is required to be conducted within 3 months of the completion of dredging.
- Chevron Australia's Quarantine Management System (QMS) is in contention for the Australian National Engineering Awards, and was a runner-up for the State Engineering Award.
- Chevron Australia is undergoing an organisational review and actively recruiting experienced operators to support the Project's transition and preparedness for operations.

### Gorgon Panel Chairs meeting with Minister

The Chair provided the Panel with an update of the Expert Panel Chairmen's meeting with Minister Marmion on 3 October 2011. The meeting was to meet the new Minister and provide him with an update on the panels and ensure alignment around expectations, the form and manner of advice and frequency of any meetings between the Chairmen and Minister. The Minister indicated he was comfortable with the work and advice of the panels.

### Long Term Marine Turtle Management Plan (LMMTMP) Implementation

Panel members were briefed on the LTMTMP implementation. Key points of discussion included:

- Site preparedness in the lead-up to the 2011/12 cyclone season and demobilisation prioritisation
- Increase in promotion of the turtle awareness campaign on site in the lead-up to the 2011/12 nesting season
- Update on in-water hatchling work, with hydrodynamic modelling work being considered for future application
- Logistics and planning needed to support this season's marine turtle monitoring program
- It was noted that the Marine Turtle Expert Panel's (MTEP's) visit to Barrow Island helped increase the visibility and the importance of the marine turtle monitoring program as well as the work of the MTEP.

## Lighting

Chevron Australia advised the Panel that it had developed a 'table-talker' which is a promotional display that goes on the tables in the dining rooms on Barrow Island. This compliments the island-wide fauna awareness and light minimisation awareness campaigns also underway.

Chevron Australia provided a brief update on the status of the Causeway Construction Support Vessel (CCSV) which arrived on site shortly after the MTEP's visit to Barrow Island. The CCSV fit-out has been completed and workforce occupancy commenced. Lighting is being tightly controlled including night-time inspections to identify any non-conforming light sources. Photographs of the vessel during the day and at night were provided to the panel demonstrating the lack of light-spill.

## Marine Turtle Management Triggers

Chevron Australia advised that there were three deviations (significant results) in control charts that triggered management responses. The three deviations were:

- mean clutch frequency on Barrow Island (BWI) ( $>-3SD$ )
- median track count index at Bivalve Beach ( $>-2SD$ ); and
- median egg hatching rate on BWI ( $>+1SD$ ) and the review of these exceedances.

The MTEP supported the conclusion from the review of the existing data and other relevant information that these exceedances were localised with no evidence that they are affecting population abundance or mean adult survival probability estimates of flatback turtles on Barrow Island, and that they likely reflect natural responses to variable climatic conditions during the season (i.e. not project-attributable). The MTEP also supported the recommendations of the review.

## Domgas Pipeline Construction

The MTEP were provided with an overview of the Offshore Domestic Gas Pipeline Installation Management Plan and confirmation that marine turtles had been taken into consideration. While it was noted that extensive surveys for turtles had not been undertaken, Chevron Australia confirmed that it would manage the pipeline installation as if turtles were present irrespective of species and abundance. It was noted the pipeline installation would be a one-off event of relatively short duration and currently scheduled to occur outside peak turtle activities. The Chair thanked Chevron for keeping the Panel informed of these activities despite there being no requirement in the Ministerial Conditions to consult the Panel.

## Marine Turtle Events

The MTEP was advised of the recent recovery of three live turtles from a pond within a bund of the Material Offloading Facility (MOF) construction area, which demonstrated that construction could occur in close proximity to turtles and through close working relations between the Project environmental staff and Department of Environment and Conservation (DEC) representatives to achieve the successful capture and release of these animals.

The Panel was provided with an overview of recent marine turtle events as well as the total number of events for the year. It was noted that there were improvements in alignment between Chevron and DEC in respect to diagnosing and assigning cause of a turtle event. In discussion, the MTEP also noted that there was the potential for ambiguity in the definitions of 'strandings' and for these differences in data to then be reflected in the two databases. The importance of ensuring alignment between Chevron's and DEC's respective Stranding Databases/records was stressed. It was proposed that, in the event that agreement by on-island DEC and Project staff could not be reached on cause of death or injury, DEC and Pendoley Environmental should discuss those events, and seek MTEP independent advice if necessary.

The Panel was advised of the planned capacity building training by DEC in strandings identification and necropsy, and the opportunities for others, including staff of Chevron Australia to be involved in the training. It was noted that other oil and gas companies with responsibilities for fauna conservation, may be interested in the database development. DEC is currently proposing to bring a specialist from the US, to train personnel who can then train others.

Great Barrier Reef Marine Park Authority (GBRMPA) staff briefed the MTEP on the Queensland Government's strandings database StrandNet. The Panel discussed the various aspects and features of StrandNet and key lessons learnt, as well as the use and application of this or similar systems nationally. The Chair thanked GBRMPA staff for providing the briefing.

Turtle monitoring programs for 2011/2012 season

The MTEP was briefed on the planned 2011-12 monitoring program and endorsed the plan.

In relation to monitoring of the effects of vessel light spill on hatchlings, the MTEP noted that the objective of the planned monitoring is to gain a basic understanding of whether and to what degree hatchlings are attracted to light spills.

Presentation on Gorgon Project and Marine Turtle Monitoring Program (to GBRMPA and others)

A presentation from Panel members was provided to GBRMPA staff, including via video link to the GBRMPA CEO and Chairman in Canberra. The presentation as followed by a range of questions and answers.

Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEC	Dr Scott Whiting	Mr Kevin Crane
Agency Subject Matter Expert - SEWPaC	Dr Kirstin Dobbs	
Proponent Representative	Mr Russell Lagdon	Dr Peter Landman
Proponent Representative	Dr Dorian Moro	
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL SUMMARY OF MEETING NO.19

**Date:** 23<sup>rd</sup> and 24<sup>th</sup> May 2012  
**Location:** Karratha Meeting Room, Ground Floor Dynon's Plaza  
**Subject:** Gorgon Marine Turtle Expert Panel – Meeting #19  
**Attendees:** All Panel members other than those for whom apologies are noted.  
**Apologies:** Dr Col Limpus

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### Project Progress Update

Chevron Australia provided the Panel with an update on project progress. Key highlights were:

- The viewing of the February 2012 Project progress video, which provided aerial footage of key project construction activities and highlights.
- The first pre-assembled rack (PAR) is scheduled to arrive in the next month.
- Drilling of the Gorgon and Jansz fields are progressing.
- During 2011 construction had focused on building on-island capacity (e.g. accommodation, materials offloading facility (MOF), and earthworks.
- Construction of the remaining accommodation village clusters is continuing. In total, there will be 12 clusters which, used with other existing accommodation, will house an on-island workforce of around 5,500 at peak construction based on current estimates.
- Chevron Australia is undergoing an organisational review and actively recruiting experienced operators to support the Project's transition and preparedness for operations.

### Long Term Marine Turtle Management Plan (LTMTMP) Implementation

Chevron Australia provided the Marine Turtle Expert Panel (MTEP) with an update on the status of the Plan's review, which was currently with Department of Environment and Conservation (DEC) and Department of Sustainability, Environment, Water, Population and Communities (SEWPaC) for a final review and endorsement in preparation for submission for approval. The MTEP discussed the likely timing of subsequent reviews of the LTMTMP and identified the need to ensure alignment between these reviews (e.g. annual reviews versus the review required after 5 years of implementation (i.e. in 2014)).

The MTEP received a report from Chevron Australia on progress in implementation of the lighting management and its audit program, and the Panel noted the steady progress being made in adaptive management of light spill.

The MTEP discussed the baseline figures reported in the approved LTMTMP (i.e. total estimated size of the flatback turtle population that utilise the east coast beaches of Barrow Island based on track counts (3900); and annual average nesters at Barrow Island and Mundabullangana based on capture-mark-recapture studies (1397 and 1700 respectively)). It was agreed that these figures should remain as the reported baseline figures until modified by an updated LTMTMP approved by the Minister (planned for 2014). In the meantime more recent estimates of total nesters and annual average nesters at Barrow Island and Mundabullangana would be reported as needed in monitoring technical reports and the MTEP Implementation Report, as more refined estimates based on accumulated monitoring data. It was also suggested that control charts should continue to be revised as new data are included in the modelling; suitable explanations for changes in the control chart points should be included with relevant control charts. It was agreed that all estimates should show the variance around the mean.

## Marine Turtle Events

The MTEP were briefed on the successful strandings workshop organized by DEC, at which 65 people attended. A key outcome of the workshop was improved appreciation of the difficulties in diagnosing cause of injury or death.

The MTEP welcomed the improved reporting on marine turtle events and suggested a number of further enhancements to the database. The MTEP also welcomed the provision of the raw data table of events compiled by Chevron, and requested that this table be provided for each meeting.

The Panel discuss and reiterated the process by which Chevron Australia could canvas the views of the MTEP Independent Members should there be a difference of opinion between Chevron and DEC as to the classification of marine turtle events. It was agreed that the MTEP Independent Members would endeavour to provide their view and or guidance as to the classification of marine turtle events in a timely manner should it be requested.

## Turtle monitoring programs for 2011/2012 season

The MTEP discussed at length the preliminary results of the 2011/12 monitoring program. During the course of the discussion the Panel suggested:

1. additional studies of hatchling dispersal at Barrow Island, including
  - a. tracking hatchlings from Bivalve Beach beyond the MOF and before the jetty is built (this will be particularly important given the expected numbers of Liquidified Natural Gas (LNG)/condensate ships utilising the jetty when full production T1-T4 is realised.)
  - b. tracking hatchlings at night, to evaluate the effect of lighting on dispersal
  - c. repeating the dispersal studies after the jetty has been built and before LNG/condensate ships begin using the jetty
2. using LIDAR data to model the beach profile changes at nesting beaches to determine whether such changes are correlated with changes in nesting behaviour at those beaches
3. correlating noise and vibration studies results with known peak noise and vibration events (e.g. blasting) to determine whether these activities were picked up by the datalogger, and what it may mean in terms of trends in turtle behaviour. The MTEP offered to provide advice on the efficacy of continuing noise and vibration monitoring in the event that trends cannot be detected.

## North West Shelf Flatback Turtle Conservation Program

The DEC representative provided the Panel with an update on the current status and progress made in respect to the formation of the North West Shelf Flatback Turtle Conservation Program (NWSFBTCP) Advisory Panel and Technical Committee. The Advisory Panel is required to be approved by the Minister for Environment and endorsed by Cabinet. The Advisory Panel is expected to provide advice to the DEC Director General, with its first meeting expected to be held in July 2012. The Technical Committee (of Experts) is also in the process of being formed. It is expected that the Committee will meet approximately twice a year.

## Proposed Expansion Project

Representatives from Chevron Australia's Gorgon Expansion Project provided the MTEP with an overview of the proposed expansion. The briefing provided by Chevron included an explanation of the EIS/PER process for the proposed LNG Train 4 expansion. The MTEP discussed the application of the current management requirements in the LTMTMP, including monitoring, to the proposed expansion.

## Extension to the Duration of the Causeway Construction Support Vessel

The MTEPs advice was sought on the likely risk to turtles from an extension in the period of the CCSV being moored at the causeway. The MTEP provided the following advice:

*“In respect to a possible extension of the CCSV presence at Barrow Island, based on the review of the 2011/2012 marine turtle nesting and hatchling emergence monitoring results, the MTEP is of the view that the CCSV appears not to have had an impact on turtle nesting and hatchling emergence. Provided the CCSV continues to be managed in accordance with current practices and approved management plans the risk of impact from its continued use during construction (e.g. possibly another two years) is considered low. Given this view is based on the monitoring results of a single season the MTEP's review of future monitoring results should include consideration of whether there is any apparent impact on turtle nesting and hatchling emergence from the CCSV.”*

### Marine Turtle Expert Panel Members

The Gorgon Marine Turtle Expert Panel comprises the following Panel Members:

<b>Panel Member's Role</b>	<b>Panel Member</b>	<b>Panel Member's Alternate</b>
Independent Chairperson	Mr Simon Woodley	
Independent Expert	Dr Mark Hamann	
Independent Expert	Dr Col Limpus	
Agency Subject Matter Expert - DEC	Dr Scott Whiting	Mr Kevin Crane
Agency Subject Matter Expert - SEWPaC	Dr Kirstin Dobbs	
Proponent Representative	Mr Russell Lagdon	Dr Peter Landman
Proponent Representative	Dr Dorian Moro	Mr Lee Mould
Proponent Representative	Dr Kellie Pendoley	

## MARINE TURTLE EXPERT PANEL SUMMARY OF MEETING NO.20

- Date:** 30-31 August 2012
- Location:** QV1 and Dynon's Plaza
- Subject:** Gorgon Marine Turtle Expert Panel – Meeting #20
- Attendees:** All Panel members other than those for whom apologies are noted.
- Apologies:** Dr Peter Landman, Dr Col Limpus (via teleconference for Item 3)

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### 1.0 Project Progress

Chevron Australia provided the Panel with an update on project progress. Key highlights and points of discussion included:

- Progress on the Jetty construction including placement of the concrete caissons is continuing
- Commencement of the Domestic Gas pipeline construction
- Offshore drilling is progressing well and offshore pipeline pipe laying is well underway

A brief update on the Expansion Project was provided.

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### 2.0 LTMTMP Implementation

#### 2.1 General update and Panel discussion on the LTMTMP implementation

Chevron Australia updated the Panel on the Long Term Marine Turtle Management Plan (LTMTMP). Key points of discussion included:

- Revision 1 of the LTMTMP was approved by the Commonwealth and State Governments in July 2012
- The next review of the LTMTMP is scheduled for 2014, which will be in conjunction with the Project's five year Environmental Performance Report and revision to include any changes required by the Expansion Project.

#### 2.2 Update on light management, controls and effectiveness

The Panel were updated on the Light Management Audit and Effectiveness Review of Lighting Controls. Key points include:

- No discernible change in the abundance of nesting adult turtles from baseline levels on Barrow Island
- Limited deviation in fan angles across monitored beaches when compared to baseline periods
- Some reduction in light levels since October 2010 (i.e. during construction earthworks)
- Limited number occasions (n=15) where hatchlings were observed in light spill offshore (noting limited sampling period)

#### 2.3 Review of Marine Turtle Events Database

The Panel noted that, while the form and content of the Marine Turtle Events Register was improved, further work is required to harmonise the different turtle events data bases so that information contained in the Register, and provided to MTEP, is consistent and accurate.

## **2.4 Mortality of Nesting Green Turtles on West Coast**

The DEC provided an overview of green turtle mortality in dune swales on the north-west coast of Barrow Island during the 2011/2012 nesting season. The Panel discussed this matter at length and noted that this past summer had been a particularly large year for green turtle nesting and that similar events in this location, and elsewhere in Australia, were not uncommon from historic observations.

The Panel suggested that Chevron Australia and DEC consider to the potential use of Skycam to assess the artificial light at these sites, but not to the detriment of other monitoring programs.

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## **3.0 2011/2012 Turtle Monitoring Program**

Pendoley Environmental staff provided an overview of the 2011/2012 monitoring program results and the Panel provided the following recommendations:

### **Hatchling Dispersal**

The Panel recommended some changes to the dispersal studies to include the addition of night tracking, use of release points beyond the predation zone, and to make estimates of survivorship. The Panel also re-affirmed the importance of survivorship studies that will need to be conducted in the future.

### **Hatchling Orientation and Artificial Lighting**

The Panel recommended the continuation of the current program, and suggested light data be collected at the same time fan angles are measured in February.

### **Satellite tracking**

Advice was sought from the Panel on the continuation of the satellite tracking program. The Panel recommended the program be suspended for 2012-13 reporting period, and be reconsidered prior to the 2013-14 monitoring program.

### **Beach Sand Temperature**

The Panel noted the difficulty of detecting any clear pattern from current data collection of sand temperature because of the many factors that can influence sand temperature. The Panel recommended changes to the monitoring and reporting of beach sand temperature in order to better understand the long-term variability.

### **Pivotal temperatures**

The Panel reaffirmed the importance of determining this parameter for understanding sex ratios and that these studies should be done as soon as practicable, but not to the detriment of other monitoring studies. The Panel requested a brief description of a project plan to measure pivotal temperature for possible implementation in 2012-13.

## **3.1 Noise and Vibration monitoring**

The Panel noted the difficulty in detecting any noise or vibration effects on turtles from project activities, due to high natural background measurements, and recommended the program be suspended and reconsidered in the context of the five year review of the monitoring program in 2014.

# MARINE TURTLE EXPERT PANEL

## SUMMARY OF MEETING NO. 21

**Date:** 21-22 November 2012  
**Location:** Barrow Island  
**Subject:** Gorgon Marine Turtle Expert Panel – Meeting #21  
**Attendees:** All Panel members other than those for whom apologies are noted.  
**Apologies:** Dr Peter Landman, Dr Col Limpus, Dr Mark Hamann, Mr Lee Mould

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### 1.0 Panel Membership

The need for an additional Independent Expert was proposed by the Chair and supported by Chevron Australia. The Panel was consulted on the expertise required as the project moves toward Operations, and agreed a broader range of skills could benefit the Panel. The Panel supported preference being given to WA based organisations or experts to build local capacity. It was agreed a new Independent Expert would be required by May 2013.

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### 2.0 LTMTMP Implementation

#### 2.1 General update and Panel discussion on the LTMTMP implementation

Chevron Australia updated the Panel on the Long Term Marine Turtle Management Plan (LTMTMP). The following monitoring and research programs are confirmed for the 2012/13 season (unless otherwise stated):

- Turtle tagging (Barrow Island and Mundabullangana)
- Hatchling fan angles (Barrow Island)
- Nest success (Barrow Island and Mundabullangana)
- Track census (Barrow Island)
- Light monitoring (Barrow Island)
- Hatchling in-water dispersal (Barrow Island): Daytime and night-time programs. Final confirmation to be determined based on logistics of executing the work this season.
- Sand temperatures (Barrow Island)
- Pivotal temperatures (Barrow Island)
- Noise and vibration monitoring suspended this season, as discussed at MTEP Meeting 20.
- Satellite telemetry program suspended this season, as discussed at MTEP Meeting 20.

#### 2.2 Update on light management, controls and effectiveness

The Panel was updated on the:

- Light Management Audit and Effectiveness Review of Lighting Controls, and
- Review of Effectiveness of Lighting Design Features, Management Measures and Operating Controls report for 2012.

The Panel noted the reviews and the continuation of the light management culture and practices.

The Panel also noted that offshore light management and the risks to turtle hatching dispersal was still a gap in knowledge, and that increased interface between DomGas pipeline installation and Pendoley Environmental is required.

#### 2.3 Review of Marine Turtle Events Database

The Marine Turtle Event Summary table was presented. Discussion was held on the level of detail and the possible need for further training for turtle stranding events.

Progress has been made on ensuring data alignment, however work is still required to ensure no double up of data occurs and that appropriate data is recorded within the Marine Turtle Events database.

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## **3.0 Update on Monitoring Program**

### **3.1 Review of Research Proposals**

Pendoley Environmental provided an overview of the monitoring program planned for the 2012/2013 turtle nesting season. A brief overview of key topics and Panel advice is summarised below:

#### **Hatchling Dispersal**

The study aims to investigate the variation in preferred hatchling dispersal pathways due to modification of sea surface currents following construction of Materials Offload Facility (MOF).

The Panel endorsed the proposed study and noted the challenges and constraints associated with the program design, suggesting the initial survey be considered a 'pilot' to iron out logistical issues.

#### **Flatback Pivotal Temperature and Sand Temperature surveys**

Changes to the beach temperature monitoring program discussed at Meeting #20 and results of the field survey completed in October, were presented. The aim of the program is to identify spatial patterns in sand temperature within and between beaches used for flatback and green turtle nesting.

The proposal for a pivotal temperature study was presented. The purpose of the study is to understand the primary sex ratio of flatback hatchlings on Barrow Island beaches. The study is designed to inform the impact of the beach temperature data being collected, and the impact of the movement of turtles from certain beaches to those that are cooler or warmer.

Panel members felt that the pivotal temperature data was an important parameter to understand possible changes to sex ratios. The Panel noted, however, that the criticality of the timing was not definitive and that further input would be sought from the Independent Experts out of session.

### **3.2 Coastal Stability Monitoring Program update**

A presentation was given on the coastal stability monitoring program on east coast beaches to assess beach volume, slope and sediment characteristics and their changes over time. The proposal presented included proposed changes to monitoring program.

The Panel noted monitoring of beach sediment characteristics at depth should be retained as this is important information for turtle nesting habitat. The Panel also suggested the focus on coastal stability monitoring be changed from beach sand volumes to available nesting habitat.

It was suggested remote sensing surveys be performed in addition to the current monitoring regime to allow a comparison between data collection methods to be made, and to ensure the proposed changes provide the necessary data is collected to support the understanding of changes to turtle nesting habitat.

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## **4.0 Review of Marine Turtle Management Triggers**

### **4.1 Review of Significant Results Diagnostic Report**

A report into the diagnosis of significant results during the 2011-2012 turtle monitoring season was reviewed by the Panel.

The Panel accepted the report and noted close attention should be given to the triggered parameters during subsequent seasons.

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## **5.0 Project Progress and Field Tour Observations**

### **5.1 Field tour observations**

The value of the site visit was reiterated. The Panel noted the following:

- Lighting levels on the MOF are significantly reduced from 12 months ago as a result of decreased construction levels.
- Abundance of positive messages and affirmations on environmental management around the site and the obvious strong culture of environmental protection in the workforce
- There was no detectable impact on turtles during construction of the MOF and congratulated Chevron Australia on their efforts.
- The long term impact of changes to coastal stability associated with the MOF construction and the associated behavioural shifts of the turtles will not be able to be determined for some time.

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## **6.0 Advice to the Minister**

The Panel discussed the format and content of the annual advice to the Minister.

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## **7.0 General Business**

### **7.1 Planning for 2014 Review of LTMTMP**

The five year performance review by Chevron as required by MS 800 is due to start in September 2014. The Panel agreed that the May 2013 MTEP meeting be used to review the schedule, responsibilities, and purpose of the reviews and to review operational information and risks.

# MARINE TURTLE EXPERT PANEL

## SUMMARY OF MEETING NO. 22

<b>Date:</b>	21-22 May 2013	
<b>Location:</b>	Dynon's Plaza	
<b>Subject:</b>	Gorgon Marine Turtle Expert Panel – Meeting #22	
<b>Attendees:</b>	All Panel members other than those for whom apologies are noted.	
<b>Guests:</b>	Mr Paul Whittock	Pendoley Environmental
	Mr Peter Grootelaar	Chevron Australia
	Ms Michelle Carey	Chevron Australia
	Mr Brendan Dooley (Observer)	Department of Environment and Conservation
<b>Apologies:</b>	Dr Peter Landman	Alternate - Chevron Australia
	Dr Col Limpus	Retiring Member - Independent Expert
	Mr Lee Mould	Alternate - Chevron Australia

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### 1.0 Project Progress

Chevron Australia provided the Panel with an update on project progress, including the March 2013 Project progress video.

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### 2.0 Transition to Operations

Chevron Australia, provided a presentation on the DomGas pipeline including the pipeline pathway and construction methodology. Specific challenges of constructing and operating the pipeline were discussed.

A presentation was then provided on the Transition to Operations. The presentation covered the various stages of commissioning, acceptance, start up and operation.

The Panel discussed the impact of commissioning and how this information could be used to inform the Panel's advice. While the Panel cannot influence the timing of key activities, it was agreed the information on commissioning activities and timeframes can be used to:

- Advise on controls or monitoring to put in place prior to specific activities occurring, such as increased monitoring of light or impacts etc
- Recommend response or contingency plans, where required, such as hatchling rescue etc
- Inform accurate interpretation of monitoring data, as impacts may be different during construction or commissioning/operations

The Chair requested an update of the commissioning plan at each meeting, noting key activities, to allow for impacts on turtle monitoring seasons to be considered.

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### 3.0 LTMTMP Implementation

#### 3.1 General update and Panel discussion on the LTMTMP implementation

Chevron Australia provided an update on the purpose and status of the current LTMTMP amendment to allow for the suspension of the satellite tracking program for the 2012/13 season. The process for consulting MTEP on proposed changes to the LTMTMP was discussed and it was agreed that the MTEP's role in amending the LTMTMP needs further clarification. The Chair noted that consultation on changes to the monitoring plan was not the same as consultation on changes to the Plan and it should be clear to the panel

members when advice is to modify the project methodology within the original scope of the Plan and when advice is used to modify the Plan.

It was suggested that MTEP produce a closing document to record the basis of supporting any changes to management plans or monitoring programs and that Chevron could submit that to SEWPaC and DEC when changes are made to turtle-related plans. This could then be used to support a more streamlined approval process.

### **3.2 Update on light management, controls and effectiveness**

An overview of the light audits performed in November/December 2012 was presented. No non compliances with lighting commitments were detected.

### **3.3 Review of Marine Turtle Events Database**

The Marine Turtle Events Database was presented and its purpose and development history, including the need for consistency between Chevron Australia and other regulator databases was discussed for the benefit of new Panel members. It was noted that there has been correspondence between DEC and Chevron Australia on data sharing and that DEC is in the process of implementing a state wide database.

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## **4.0 Update on Monitoring Program**

### **4.1 2012/13 Preliminary Monitoring Results**

Pendoley Environmental provided preliminary monitoring results for the 2012/13 season. Key outcomes and discussion points for each program are as follows:

#### Tagging Program

- A higher proportion of turtles were recorded on Terminal beach in 2012/13 season compared to 2011/12.
- Movement of turtle observations on Bivalve and Terminal beaches reflects the observed changes in beach morphology with increases at the southern end of Terminal beach and the northern end of Bivalve beach.

#### Nest Success Program

- Hatch success rates were higher at Barrow Island and lower at Mundabullangana than for the 2011/12 season.
- Differences in nest success rates indicate potential temporal variability with lower nest success rates associated with increased temperatures and shorter incubation periods.

#### Track Census Program

- Green turtles had a significant reduction in nesting this season which is part of the cyclical nature of green turtle nesting.

#### Hatching Surveillance & Orientation Monitoring

- Hatchling offset angles were narrower for Terminal beach in 2012/13 season and wider for Yacht Club south and Bivalve beaches.

#### Light Monitoring

- Monitoring now allows for 360° high definition images of the sky and provides images of average light received by the camera over the night
- Potential to use light monitoring data to identify locations of contributing light sources was presented and discussed.
- Suggestions on how interpretation of the data could be modified to allow more accurate interpretation of the results were recommended.

#### Beach Sand and Pivotal Temperature Programs

Refer to item 5.2 for discussion of these programs.

## 4.2 Review of Research Outcomes

### Hatchling Dispersal

Chevron Australia advised the Panel that during the planning for the 2012/13 hatchling dispersal program, Department of Transport licensing requirements prevented the program from being implemented.

The Panel re-iterated the importance of establishing a baseline, if possible, and recommended that:

- Chevron Australia acknowledge early if the stated objectives of the program are not able to be met
- Ensure the revised objectives of any future monitoring are documented and agreed by the Panel

### Flatback Turtle Pivotal Temperature

Chevron Australia advised the Panel that this program was undertaken by Pendoley Environmental with Dr Col Limpus as a technical advisor, but had to be terminated after all 200 eggs collected became too cold during transportation. The outcomes of a Chevron Australia Root Cause Analysis workshop into the program failure were shared with the Panel.

Chevron Australia queried whether the original justification for conducting the program is still valid and requested the Panel provide further advice to support a justification for repeating this program.

The Panel agreed the program could be deferred without any impact on the overall monitoring program, and that the focus should be on more time sensitive monitoring requiring completion within the construction timeframe.

Chevron Australia requested clarification of the direct relevance or purpose of this program for Gorgon. It was agreed the Chair would work with Panel members out of session to develop a paper on the potential value and purpose of this program to Chevron Australia's broader turtle monitoring program.

Four potential objectives for the study were discussed as follows:

- Local relevance to Barrow Island turtle sex ratios if turtles move to adjacent beaches with different temperature ranges
- North West Shelf relevance – pivotal temperature for management units up and down the coast
- Providing the empirical data to support future modeling of temperature impacts on incubation duration and temperature
- Understanding biology and natural variation that's occurring as a result of climate change

### Beach Sand Temperature

Chevron Australia stated in order to understand the variation in sand temperature across beaches and in clutches, arrays of monitors have been installed on several beaches. To date there is little correlation between nest success parameters and sand temperature data collected, and right now there is no specific use for the sand temperature data. Chevron requested advice from MTEP on the value of sand temperature monitoring to understand project impacts on flatback turtles.

The Panel members noted that:

- They need to see the array data before they can determine the value of continuing the program
- Sand temperature is a long term parameter whose value may be more apparent after five or ten years of available data
- Sand temperature data are valuable, because if you have low nesting success it could be a contributing factor to understanding those changes
- Although clutch temperature is monitored, it is not a proxy for beach temperature (clutch temperature is a valid parameter that could inform nesting success but the sand temperature may inform changes in clutch temperature)
- Changes in depth of beach sand over rock may affect sand temperature and collecting sand temperatures at Barrow and Mundabullangana may help determine whether changes are localised or regional in nature

In summary, the Panel felt insufficient data had been collected to judge the value or otherwise of the data. However, it was agreed there may be the possibility to change the nature and scale of the program to key locations and/or beaches.

Chevron Australia agreed to continue with a beach sand temperature program and to review it again as part of the 5 year plan review. It was recommended that as part of this review, the objectives of the program be rewritten, as it currently reads as a method statement and doesn't clearly explain the purpose of the monitoring.

#### Satellite telemetry

Chevron requested advice from the Panel on the value of reinstating the satellite telemetry monitoring program for the 2013/14 season.

Discussion on the program included:

- Track surveys and tagging work is considered a more valuable way of collecting data on turtle nesting behavior, however it may not show in-water behavior while selecting beaches and
- The small sample sizes collected over two seasons of different construction phases has resulted in significant variability in results which is currently difficult to interpret
- Dredging is complete; while not singled out in the project objectives, it is one of the stressors affecting turtle movements
- The value in using satellite telemetry to track turtle movement around the MOF
- The review of habitat data, as proposed in lieu of satellite telemetry in the August 2012 meeting minutes, will be required by regulators prior to consideration of further program suspensions. Due to long lead times on the equipment required to undertake satellite tracking, Chevron Australia felt there was insufficient time to complete the proposed review and gain approval to suspend the monitoring program prior to the 2013/14 season
- Chevron Australia agreed to re-instate the satellite tracking program and present a proposal at the August 2013 meeting which while designed to meet the program's objectives, will be reduced in scale from the original program
- The purpose of the habitat mapping review was clarified as identifying and delineating internesting habitat using existing information. Chevron Australia proposed to revisit the need for this work as part of the 5 year review
- The Panel agreed that the following statement recorded in Section 4.1 of the August 2012 minutes contains an error: "The Panel agreed that the data collected to date gave an understanding of use of space by flatback turtles pre and post construction, during, nesting and internesting periods, but not non-breeding periods." The correct statement is as follows: "*The Panel agreed that the data collected to date gave an understanding of use of space by flatback turtles, during nesting and internesting periods pre construction, and during construction (particularly during dredging activities). Chevron had collected limited pre-construction data during the non-breeding periods.*"

#### Hawksbill track changes, Whole island track census, Sand temperature, Noise and vibration and Tagging Programs

Chevron Australia advised that they would like to review the above listed monitoring programs to see if they can be modified, optimised or suspended in line with adaptive management practices.

The Panel advised that they would like to see this season's data to make an informed decision and so it was agreed to review requests for further changes in the August meeting.

The Panel agreed that periodic reviews of the programs and their potential value is critical, but advised that a structured approach should be adopted so further requests to modify or suspend programs and ensure the original intent of the programs are considered to better utilise the Panel's time .

The Panel suggested that with the 5 year review commencing next year, the focus of any proposed program changes during the construction period should be on improved data collection methods, in line with the preference to collect reasonable data for the construction period.

It was suggested that papers should be provided to support suggested program changes which:

- Consider the intent of the Ministerial conditions and stated objectives of the programs
- Provide information to justify the change
- Suggest alternatives

Chevron Australia noted that as we head towards operations, the focus will move towards compliance and so additional work will come under increased scrutiny and review across all environmental monitoring programs.

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## 5.0 Update on Coastal Stability Monitoring Program

Chevron Australia provided an update to the November 2012 coastal stability presentation. Key highlights and points of discussion included:

- Baseline data for coastal stability program was only conducted over 18 months which coincided with a very calm period, so management triggers are easily exceeded
- Changes in beach profile have been observed for both Terminal and Bivalve beaches in response to the MOF construction
- Bivalve beach is experiencing a more gradual change in profile in response to the MOF
- Data indicates at Bivalve and Terminal beaches the volume of sand on the beach is not changing but sand is moving from one part of the beach to another
- Terminal beach's changes have been more dramatic because of significant easterly storms
- Anecdotally the experience on the island is that seasonal beach movement is normal, but that the magnitude of change appears larger. The limited baseline data makes actual comparisons difficult

Chevron provided a presentation on the proposed changes to the Coastal Stability monitoring program and their justification. Key highlights and points of discussion included:

### Beach morphology

- LiDAR surveys and transect data comparisons show good compatibility between methods
- UAV correlation to transect data has not been done because of initial discrepancies between the UAV and LiDAR models. UAV has better resolution and aerial photography capability and, if it can provide the same data accuracy as LiDAR, is likely to be Chevron Australia's preferred method.
- The use of LiDAR or UAV was supported by MTEP. Panel members noted that LiDAR is used extensively in Queensland and also in other locations in Western Australia.

### Sediment characterisation

- Five years of moisture content, sediment density and particle size distribution data is available but not being used for coastal stability assessments. The value of the data to turtle monitoring (given that the locations and times of data collection don't directly correlate with nests) was discussed.
- Although the data can't be used to support nest success, the Panel felt it was important to maintain some form of monitoring for these parameters.
- MTEP supported the reduction in frequency and scope of this part of the program, but suggested further consideration needs to be given to when data collection is of most use for determining effects of coastal changes on nesting success.

### Survey frequency

- Six monthly monitoring was proposed in line with two main seasons on Barrow Island. Best months to monitor in order to provide relevant data for nesting habitat availability was discussed.
- It was suggested mid-season monitoring may be more useful as it would capture data during nesting periods and at periods more likely to be subject to extreme weather. However monitoring of any major changes is likely to be adequately addressed by post major event monitoring, which is maintained in the program.

MTEP support the approach to better align the coastal stability monitoring with the turtle monitoring requirements and agreed to consider the presentation and proposal in more detail out of session and respond to Chevron Australia in line with the required timeframe.

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## 6.0 Planning for 5 Year Review of LTMTMP

Chevron Australia provided a presentation on the background, purpose and proposed process for the 5 year review. Key highlights and points of discussion included:

- The purpose of the review is two-fold; to meet the requirements for the 5 year Environmental Performance Report (EPR) and to meet the commitments for a 5 year review specified within the LTMTMP itself.
- Period covered by the review is monitoring and scopes of studies data from the 2009/10 to 2013/14 seasons. Consideration to including 2014/15 data will be given if available within the required timeframe.

- While the plan review process doesn't indicate a plan review until 2016, this doesn't preclude adaptive management changes to the Plan being proposed before then, if required, noting the comments in Item 6 about how such changes should be proposed and considered by the MTEP.
- Public availability of the 5 yearly turtle review was discussed. It was noted that the five year EPR will be a public document, but that reports which inform the Plan's review may not necessarily be made public.

The Chair requested that MTEP be proactively involved in the design of the scope and process for the review of the LTMTMP, and that MTEP's involvement in the process be clearly defined. Where possible, it was requested that any additional panel involvement be arranged around the existing meeting structure.

Chevron Australia will map out tasks for the planned meetings between now and the 5 year EPR submission date, and plan to have the first draft of the scope of work for the Plan(s) for MTEP's consideration at the next meeting.

Chevron Australia will confirm its understanding of the commitments for the 5 yearly review with DEC and SEWPAC.

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## **7.0 North West Shelf Flatback Turtle Conservation Program**

The North West Shelf Flatback Turtle Conservation Expert Panel has almost completed an Internal draft plan to go to the Advisory Committee for review. The paperwork required to establish the Advisory Committee is with the Premier's office. Once approved by the Premier and the Minister for Environment it goes to Cabinet for approval because of funding arrangements.

It is hoped that the Advisory Committee can meet in July 2013. In the interim, recruitment and some background work is underway around issues such as planning for stranding network and funding of monitoring under WAMSI 2 (survey of nesting beaches from south of Broome to Northern Territory border).

It was noted that predation of turtle nests by foxes is only anecdotal in nature and needs further discussion between DEC and Chevron Australia in future to see whether better data can be collected on this issue.

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## **8.0 General Business**

A paper was circulated with a proposed process on approval of observers. There are currently four categories of people who could attend meetings: Members, Alternates, Guests (at our invitation to provide presentations or information) and Observers (to the benefit of the observer or their organisation). The administration guidelines have addressed the first three categories, but not the fourth. Points raised in the discussion included:

- Value to the observers of attending meetings as information is subject to confidentiality
- Observers are likely to be other government staff who are bound by public service ethics and codes of conducts
- Concern about how observers may affect the nature and freedom of discussion
- The need to understand the objective of the observer in attending
- The role of the nominated member, where the observer comes from the same organisation.

It was requested that if anyone has any further comments on the position paper they please email these to the Secretariat. The proposed paper will be discussed with other Panel Chairs prior to finalisation of the process.

# MARINE TURTLE EXPERT PANEL

## SUMMARY OF MEETING NO. 23

<b>Date:</b>	27-28 August 2013	
<b>Location:</b>	Dynon's Plaza	
<b>Subject:</b>	Gorgon Marine Turtle Expert Panel – Meeting #23	
<b>Attendees:</b>	All Panel members other than those for whom apologies are noted.	
<b>Guests:</b>	Mr Paul Whittock	Pendoley Environmental
	Mr Ben Goodsell	Pendoley Environmental
	Dr Catherine Bell	Pendoley Environmental
	Mr Tyrone Farrell	Pendoley Environmental
	Dr Milani Chaloupka	Ecological Modelling Services P/L
	Ms Michelle Carey	Chevron Australia
<b>Apologies:</b>	Dr Peter Landman	Alternate - Chevron Australia
	Dr Andrew Heyward	Independent Expert
	Mr Lee Mould	Alternate - Chevron Australia

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### 1.0 Project Progress

Chevron Australia provided the Panel with an update on project progress, including the August 2013 Project progress video.

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### 2.0 Transition to Operations

Panel members were provided with an overview of commissioning activities with the potential to impact turtles. Chevron Australia will continue to provide regular updates on the progress of commissioning activities.

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### 3.0 LTMTMP Implementation

#### 3.1 General update and Panel discussion on the LTMTMP implementation

Chevron Australia advised that LTMTMP Revision 1 has been approved

#### 3.2 Update on light management, controls and effectiveness

Chevron Australia advised that the annual review of the effectiveness of lighting design and management is underway and will be presented to MTEP at November meeting.

#### 3.3 Review of Marine Turtle Events Database

Chevron presented the Marine Turtle Events database and the decision table that was developed to improve consistency of reporting between multiple database users.

#### 3.4 Protocols on seeking MTEP advice on amendments to the LTMTMP and monitoring programs

The Panel endorsed the template and process for consultation on proposed changes to programs and the LTMTMP and requested MTEP advice section be dated.

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## 4.0 2012/2013 Monitoring Program

### 4.1 Review of the 2012/2013 program results and planning for 2013/14

MTEP discussed the preliminary results of the 2012/13 nesting season during Meeting No. 22 and the detailed technical reports were provided as pre-read for the meeting.

Pendoley Environmental presented on the objectives of each monitoring program, the parameters on which data was collected, methods of data collection and a summary of the results.

#### Barrow Island and Mundabullangana Beach Temperature

Key discussion points on the monitoring results included:

- Locations of the arrays were selected for their longevity. Criticality of the middle logger was noted without it the array data would be of limited value. Duplication of the middle logger as a precaution was suggested
- Bivalve and Terminal beaches are generally cooler than other beaches and hence important in terms of likelihood of producing males
- The Panel recommended maintaining the current program for 2013/14 and reviewing it as part of 5 year review

#### Flatback Turtle Tagging Program

Key discussion points on the monitoring results included:

- No project related or suspicious injuries were detected and no diseases identified during season.
- Chevron Australia agreed to review the tagging data to investigate whether or not there was any impact from the redistribution of sand on Terminal and Bivalve beaches on the nesting success of Flatback turtles on those beaches, movement to other beaches, or an impact on the population overall.
- Chevron Australia advised that a review of the tagging program is underway to see if the program can be modified to reduce bedding requirements while maintaining the necessary robustness. Timing of the review is not yet defined. In the event that any changes to the current Tagging program are suggested as a result of the review, the results and associated recommendations will be presented to the Panel out of session.
- The Chair advised that the MTEP needs to be aware of the operational context in which Chevron Australia seeks to implement the LTMTMP, however it is not the Panel's role to comment on how operational issues should be resolved. The Panel's advice on proposed changes to monitoring programs should be undertaken in accordance with the Expert Panel Operating Guidelines, and responsibilities as defined in the Ministerial Conditions.

#### Hatchling Dispersal offshore

Key discussion points on the monitoring results included:

- MTEP supported the proposed program over four years with the following suggested changes:
  - release hatchlings from both beaches each year
  - break down methodology by year so it's clear what is being investigated
  - data collected beyond the MOF in years one and two (approx. 500m if possible), to answer the question of what the impact of the MOF is on hatchling dispersal
  - data collected from beyond the end of the jetty prior to tanker loading (years three and four) and subsequent data after tanker loading commences, where possible

#### Hatching Surveillance and Orientation onshore

Pendoley presented a recently completed lunar phase statistical assessment which was not included in the report. Next season's monitoring reports will include the hatchling orientation measures taking into account various seasonal sampling issues such as moon phase.

Key discussion points on the monitoring results included:

- Proposal to change the timing of monitoring to peak emergence times, and incorporate monitoring or hatchling emergence in new and full moon phases
- Panel identified the need to account for new moon and full moon phases in fan angle control charts and baseline data
- Panel recommended the baseline be reviewed as part of the 5 year review to ensure its continued relevance

### Light Monitoring

The Sky 42 light monitor was shown to the Panel and its capability discussed. Data was presented and analysis of light sources including LNG plant, MOF, offshore vessels and accommodation village.

### Success Program

- Hatch success rates were higher at Barrow Island and lower at Mundabullangana than for the 2011/12 season.
- Differences in nest success rates indicate potential temporal variability with lower nest success rates associated with increased temperatures and shorter incubation periods.

### Track Census Program

- Green turtles had a significant reduction in nesting this season which is part of the cyclical nature of green turtle nesting.

### Hatching Surveillance & Orientation Monitoring

- Hatchling offset angles were narrower for Terminal beach in 2012/13 season and wider for Yacht Club south and Bivalve beaches.

### Light Monitoring

- The Sky 42 light monitor was shown to the Panel and its capability discussed. Data was presented and analysis of light sources including LNG plant, MOF, offshore vessels and accommodation village
- Chevron Australia advised that they are considering reducing the scope of October 2013 monitoring to beaches nearest the LNG plant, as opposed to all six beaches, as data is only used for workforce education, rather than to compare with the hatchling emergence success. Chair sought MTEP input and stated that general advice was to maintain the current monitoring locations for the coming season
- DPaW raised the issue of green turtle deaths on West coast of Barrow Island, previously brought up in Meeting No. 20. Chevron Australia committed to investigate previous records of deaths on the west coast beach to help inform their response and to discuss the matter with DPaW out of session.
- Monitoring now allows for 360° high definition images of the sky and provides images of average light received by the camera over the night.

### Satellite Tracking of Internesting Flatback Turtles

The Panel provided advice to Chevron Australia on the satellite tracking program and supported not using time depth recorders.

### Track Census

Key discussion points on the monitoring results included:

- There are no plans to change the track census program for 2013/14 season
- Consideration of alternate data collection options, such as UAV's was queried. Chevron Australia and Pendoley have no current plans to review data collection methods. Panel members advised that there is a steep learning curve for their use to ensure effectiveness, and while a lot of work is underway to improve the technology there are also limitations to their use. In the event alternate data collection methods are considered there is benefit in comparing the new methodology in parallel to current programs to provide a basis for assessment of results

### Nest incubation success

Key discussion points on the monitoring results included:

- Cause in the variation in egg mass and size for Munda populations is unknown, although it was noted that in hotter areas turtles tend to be smaller and produce smaller eggs.
- Results provide a good relationship between beach sand temperature and nest success and incubation.
- The Panel advised that monitoring of Mushroom beach should be maintained as it is the beach most likely for turtles to move to if they leave Terminal and Bivalve beaches

### Control Charts, including discussion of trigger exceedances

Dr Chaloupka provided a presentation on the analysis and interpretation of the 12 parameters being charted.

Key points from discussion included:

- Mean clutch frequency is a derived parameter and the method for calculation has changed. Consequently original and new methods are presented concurrently for a few years to determine any variability
- Noted that daily track count parameter is a useful parameter and index

- Hatchling orientation requires further analysis – hence work on lunar phase analysis. Trends appear to be emerging in hatchling disorientation for both Bivalve and Terminal beaches
- Bivalve and Terminal beach temperature results are very variable, although on average temperatures are lower than for other beaches
- Chevron Australia advised that it will consider whether or not review of the use of control charts will be considered as part of the five year review.
- The Munda and Barrow Island Flatback turtle populations share a genetic history over geological time.

## 4.2 Review of Flatback Turtle Pivotal Temperature Position Paper

The Chair presented the Pivotal temperature paper and asked for the Panel's advice.

The Panel endorsed the paper as a summary of the benefits of measuring pivotal temperature and noted that understanding pivotal temperature would help inform the interpretation of nest success and beach sand temperature data. The Panel recommended consideration of monitoring this parameter in 5 year LTMTMP review.

Chevron Australia stated that the timing and need for pivotal temperature information should be triggered by the control chart process; if turtles are moving to other beaches with a different temperature profile as a result of the Project.

## 4.3 Coastal Stability monitoring frequency

Chevron Australia provided a presentation with further justification for the change from quarterly to biannual survey. The MTEP supported all proposed changes to the Coastal Stability monitoring program and the proposed Plan amendment with the following comments:

- Section 5.1 should specify survey frequencies as biannual **and** post storm (rather than **or** post storm).
- The need for humidity data as an indicator of soil moisture content was recommended to be assessed as part of the 5 year plan review
- An update of the status of coastal stability will be provided at the next meeting
- The Panel requested, if possible, that future annual coastal monitoring reports be available for the August MTEP meeting.

## 4.4 5 Year Review of LTMTMP

- Chevron Australia presented a slide which explained the timing of the 5 year review in the context of the turtle seasons.
- The Panel was advised that while the wording in the LTMTMP appears ambiguous, the timing of the 5 year review is specified as November 2015 in the approved Compliance Assessment Table for the LTMTMP.
- MTEP's role in the 5 year review will be clarified, together with the scope of the review, at the November meeting.

# MARINE TURTLE EXPERT PANE

## SUMMARY OF MEETING NO. 24

**Date:** 19 November 2014  
**Location:** Dynon's Plaza, Perth  
**Subject:** Gorgon Marine Turtle Expert Panel – Meeting No. 24  
**Attendees:** All Panel members other than those for whom apologies are noted.  
**Apologies:** Dr Peter Landman, Mr Lee Mould, Ms Michelle Carey

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### 1.0 LTMTMP Implementation

#### 1.1 Update on LTMTMP Operations Review

In preparation for the transition from construction to operations, Chevron Australia has undertaken a review of the currently approved environment plans to see if any need updating prior to operations commencing. A review of the Long term Marine Turtle Management Plan (LTMTMP) has identified a number of revisions required prior to the handover of general utilities in Q1 2014.

The proposed changes were circulated prior to the meeting and feedback from Panel members was sought and discussed.

#### 1.2 Update on Light Management, controls and effectiveness

Chevron provided a presentation on the outcomes of the Review of Effectiveness of Lighting Design Features, Management Measures and Operating Controls (the Review).

#### 1.3 Review of Marine Turtle Events Database

Chevron Australia presented key points of interest from the marine turtle database.

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### 2.0 Update of Monitoring Programs

#### 2.1 Diagnosis of significant results

Diagnosis of significant results during the 2012/13 season was presented.

The Panel supported the recommendations in the pre-read paper:

1. Annual Barrow Island nester abundance to continue to be estimated in the 2013–2014 Flatback Turtle season.
2. Marine turtle estimates of mean clutch frequency to be continued in the 2013–2014 Flatback Turtle season.
3. Marine turtle monitoring of daily track counts of east coast beaches to be continued in the 2013–2014 Flatback Turtle season.
4. Marine turtle estimates of egg hatching rate to be continued in the 2013–2014 Flatback Turtle season. Control charting of this metric (and hatchling emergence rate) should be investigated using a more thorough statistical modelling approach to derive a standardised control chart metric because different sampling designs over past beaches and seasons may be contributing to the observed deviations.

#### 2.2 Terminal and Bivalve beach review

The Chair explained the purpose of the paper and thanked Chevron Australia and Pendoley Environmental for their collective work in responding to his request.

The Panel acknowledge that most of the control chart processes are designed to detect population level changes, rather than localised impacts.

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Panel members agreed to review the paper and provide comments back via the Secretariat.

### **2.3 General Update on 2013/14 monitoring program**

Chevron Australia provided an update on planning and execution for 2013/14 marine turtle nesting season. All programs were being mobilised as per schedule.

### **2.4 Turtle tagging program review**

Chevron Australia provided a presentation on proposed reductions to the intensity of the turtle tagging program. The Panel was asked to provide advice on the impact of the proposed reduction in monitoring intensity on the objectives of the LTMTMP.

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## **3.0 Update on Coastal Stability Monitoring Program**

A presentation was given to the Panel on the status of the review of the coastal stability monitoring program and the current condition of beaches on the east coast of Barrow Island, with particular focus on the status of Bi-valve and Terminal beaches.

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## **4.0 5 Year Review of Long Term Marine Turtle Management Plan (LTMTMP)**

Chevron Australia provided a presentation on the scope, process and timing of the 5 year review of the LTMTMP and the Coastal Stability Management and Monitoring Plan. Chevron Australia advised that work is continuing on the development of a detailed scope of work for the reviews. The scope of work will be reviewed with the Panel either at the next meeting, or during an additional out of session workshop.

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## **5.0 General Business**

### **5.1 2013 Annual Advice to Minister and Chevron Australia**

The Chair presented the Panel with a draft list of topics for inclusion in the annual advice to the Minister. The Chair will develop draft advice, based on feedback received, for circulation and review by the Panel.



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## **4.0 Coastal Stability Monitoring Program**

### **4.1 General update of monitoring program results**

Chevron Australia provided an update on the October 2013 coastal stability monitoring results. Changes to the beach profile at Terminal and Bivalve beaches have been observed since the construction of the MOF however changes, to a lesser extent, have also occurred at the references beaches (Inga, Yacht Club North and Yacht Club South).

### **4.2 Update on Coastal Stability Monitoring Program plan amendments: monitoring scope and management triggers**

The panel supported proposed changes to the monitoring program including the use of a biannual LIDAR survey and a once off depth to bedrock survey.

Chevron Australia withdrew the proposed amendment to the two management triggers and will revised the approach for detecting potential changes to turtle nesting habitat. An update will be provided at a future MTEP meeting.

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## **5.0 Monitoring Programs**

Pendoley Environmental provided a preliminary update on the 2013/2014 turtle monitoring season planning and execution. A detailed update will be provided at MTEP Meeting No. 26.

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## **6.0 Planning for 5 Year Review of LTMTMP**

Chevron Australia provided an overview of the scope of the five-year environmental performance review. The Panel sought clarification of the review products. Regular updates of the review will be provided at future meetings.

Chevron Australia provided an overview of the process for completing the five-year environmental performance review, including the proposed timeline and involvement of MTEP at key points.

The Panel requested the Secretariat circulate a revised MTEP meeting schedule that captures the key consultation stages with MTEP.

# MARINE TURTLE EXPERT PANEL

## SUMMARY OF MEETING NO. 26

<b>Date:</b>	28 and 29 August 2014	
<b>Location:</b>	Chevron Offices	
<b>Subject:</b>	Gorgon Marine Turtle Expert Panel – Meeting #26	
<b>Attendees:</b>	All Panel members other than those for whom apologies are noted.	
<b>Guests:</b>	Dr Milani Chaloupka	Ecological Modelling Services
	Mr Paul Whittock	Pendoley Environmental
	Ms Michelle Carey	Chevron Australia
	Prof Charitha Pattiaratchi	The University of Western Australia
<b>Apologies:</b>	Dr Kirstin Dobbs	Member – The Department of the Environment
	Dr Stuart Field	Alternate - Department of Parks and Wildlife
	Dr Karen Arthur	Alternate– The Department of the Environment

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### 1.0 Project Progress

Chevron Australia provided the Panel with an update on project progress, including the July 2014 Project progress video.

Chevron Australia provided the Panel with an overview of the driver for, and scope of, the Gorgon Fourth Train Public Environmental Review.

Chevron Australia provided the Panel with an overview of the timing and management approach for the additional accommodation vessel to be positioned alongside the Materials Offloading Facility (MOF). Lighting will be managed as per the commitments in the Long Term Marine Turtle Management Plan (LTMTMP).

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### 2.0 LTMTMP Implementation

#### 2.1 Update of LTMTMP operations review

Chevron Australia sought approval to amend the Long-term Marine Turtle Management Plan (LTMTMP), Revision 1, Amendment 1, to suspend the noise and vibration monitoring program (as previously endorsed by MTEP). Suspension of the program was approved and the plan has been amended accordingly. The current revision of the LTMTMP is Revision 1, Amendment 2. Proposed amendments have been reviewed by the Panel.

#### 2.2 Review of Marine Turtle Events Database

Chevron presented key points of interest from the Marine Turtle Events database.

#### 2.3 Review of reporting requirements under Ministerial Condition 16.7

Chevron Australia provided an update on the review of the requirement to report turtle mortality events (natural and non-natural) in accordance with Ministerial Condition 16.7. The Chair confirmed that this is a compliance matter and if Panel advice was to be sought then there is a mechanism for the Minister to request advice from the MTEP.

The Panel requested that they are informed if, and when, Chevron Australia proposes any changes to Ministerial Statement 800 conditions relevant to marine turtles.

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## **3.0 Coastal Stability Monitoring Program**

### **3.1 General update of monitoring program results**

Chevron Australia provided an update on the October 2014 coastal stability monitoring results. The rate of change recorded for beach slope and volume at both Crest of Beach Face and the Foredune Area on Bivalve and Terminal beaches was lower for the 2013-2014 season when compared with previous seasons.

While changes to the beach profile has occurred the marine turtle monitoring program results have not detected a change in the nesting behaviour of the Barrow Island Flatback Turtle population.

Chevron Australia has just completed the depth to bedrock survey which will define depth and distribution of sand. A report is in preparation. Information can then be used to interpret available nesting habitat.

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## **4.0 2013/2014 Turtle Monitoring Program**

Pendoley Environmental provided an overview of the 2013/2014 Turtle Monitoring program results. .

Pendoley Environmental presented a summary of the objectives of each monitoring program, the parameters on which data was collected, a summary of the results (including additional analysis of data for Bivalve and Terminal Beaches as appropriate) and the proposed monitoring program for the 2014/2015 monitoring season.

The Panel supported the proposed 2014/15 monitoring program as set out in the pre-read (track census, tagging, nest incubation, satellite tracking, beach temperature, light monitoring, hatchling orientation onshore and hatchling dispersal offshore).

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## **5.0 Terminal and Bivalve Beach: understanding future sand movement**

Comments were sought from Panel members by Chevron Australia on the proposed scope of work Chevron Australia will undertake to understand:

- a. What is driving the sediment movement on Bivalve and Terminal beaches, and can we predict when the changes observed will stabilise and what this new equilibrium state will be?
- b. How will the area of suitable turtle nesting habitat on Bivalve and Terminal beaches (access, sediment depth and particle size) change over time as a result of the cause(s) identified?
- c. Is the cause(s) of the observed change in the area of turtle nesting habitat on Terminal and Bivalve beaches likely to affect other east coast beaches

Professor Charitha Pattiaratchi, from the University of Western Australia, was invited as a guest to present an overview of the forces driving sand movement at Bivalve and Terminal beaches based on available data.

Terminal and Bivalve Beaches are pocket beaches (closed systems) and there is minimal exchange of sand between beaches. When a structure is placed on a pocket beach, there is a convergence of flow (and sand movement) towards the structure on both sides.

The Panel supported Chevron Australia's proposed scope of work to understand the driving force behind sand movement on Terminal and Bivalve beaches and look forward to receiving an update on the scope of work findings at a future MTEP meeting.

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## **6.0 Five year environmental performance review**

Chevron Australia provided an overview of the process that will be undertaken to complete the five year environmental performance review. This included an overview of the review deliverables and interface with the Panel.

# MARINE TURTLE EXPERT PANEL

## SUMMARY OF MEETING NO. 27

**Date:** 18 December 2014

**Location:** Chevron Offices

**Subject:** Gorgon Marine Turtle Expert Panel – Meeting #2

**Attendees:** All Panel members other than those for whom apologies are noted.

**Guests:** Ms Michelle Carey                      Chevron Australia

**Apologies:** Dr Mark Hamann                      Member - Independent Expert  
Dr Karen Arthur                      Alternate– The Department of the Environment

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### 1.0 Project Progress

Chevron Australia provided the Panel with an update on project progress, including the October 2014 Project progress video.

Chevron Australia communicated that the Response to Submissions/Final EIS for the Gorgon Gas Development Fourth Train Proposal had been submitted to the Department of the Environment (DotE) and the Office of the Environmental Protection Authority (OEPA).

Chevron Australia provided an update on the activities listed in the Commissioning Plan relevant to marine turtles.

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### 2.0 LTMTMP Implementation

#### 2.1 Update of LTMTMP operations review

Chevron Australia provided an update on the status of the revision of the Long-term Marine Turtle Management Plan Revision 1 Amendment 3. Included in this revision is the removal of the requirement in Table 10-2 to report 'Any detected mortality of any marine fauna declared under section 14 (2)(ba) of the Wildlife Conservation Act 1950', which is a duplication of Statement 800 Condition 16.7.

#### 2.2 Review of Marine Turtle Events Database

Chevron presented key points of interest from the Marine Turtle Events database.

#### 2.3 Overview of Chevron Australia audit on lighting management and effectiveness

Chevron Australia provided an update on the light audit and review completed annually in accordance with the Ministerial Condition requirements.

As reported at Meeting No. 26, results of the 2013-2014 Marine Turtle monitoring programs did not detect any impact that was directly attributable to Project activities and associated lighting.

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### 3.0 Marine Turtle Monitoring Programs

Chevron Australia provided an update on the implementation of the 2014/2015 Marine Turtle Monitoring Programs.

The Flatback Turtle Tagging program on Mundabullangana (Munda) was interrupted due to the presence of a large saltwater crocodile observed on the beach by one of the volunteer groups. The tagging program was implemented for a total of 12 out of a possible 60 nights

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## **4.0 Scope of Work: Flatback Turtle habitat utilisation at Terminal and Bivalve Beaches**

### **4.1 Summary of sediment depth survey results**

Chevron Australia provided an update on the results of the sediment depth survey that was completed on Barrow Island August 2014.

The Panel supported the approach being taken by Chevron Australia to determine sediment depth as a necessary measurement to determine available nesting habitat

### **4.2 Discussion on methodology proposed for determining suitable nesting habitat**

Chevron Australia provided an update on work undertaken to define potential nesting areas based on the physical parameters measured under the Coastal Stability Monitoring and Management Plan and the results of the 'bedrock layer' survey that was completed on Barrow Island during August 2014.

Parameters have been defined to determine areas of potential nesting habitat and include accessibility, particle size and sediment depth. The Panel provided advice on the parameters presented and supported the approach provided.

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## **5.0 Five year Environmental Performance Report**

### **5.1 Marine Turtle Risk Assessment Process**

Chevron Australia provided an update on the marine turtle five year risk review objectives and scope and the process that will be followed.

A detailed overview of the RiskMan2 Workshop outputs will be provided at MTEP Meeting No. 28 (May) including detail on any changes in risk profile, for Panel advice and comment.

The Panel noted the risk review scope and process presented at the meeting.

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## **6.0 2014 Annual advice to Minister and Chevron Australia**

The Chair advised the Panel that he will draft the 2014 Annual Advice to Minister and Chevron Australia and will provide a copy to the Panel for review.