

## **Appendix G: Underwater Noise Management Protocol (UNMP)**

## **1 SCOPE**

This document presents the Underwater Noise Management Protocol (UNMP) ('Protocol') for managing underwater noise associated with piling works during installation of the Ashburton Infrastructure Project (AIP). It has been informed by underwater noise modelling performed by Talis Consultants (2022).

As the Proposal Developer, Mineral Resources (MinRes) are responsible for the development, implementation and execution of this document. The contractor appointed by MinRes will be required to refer to this Protocol within their Marine Construction Environment Management Plan (MCEMP). As such, they are responsible for adhering to the requirements and obligations outlined within.

## **2 OBJECTIVES**

The purpose of this work instruction is to inform piling contractors, the obligatory requirements of Pre-Start, Soft-Start, Shut Down procedures and low visibility condition protocols. These procedures are to be carried out with guidance from the on-board Marine Fauna Observer (MFO) and will be audited by the MinRes Environmental department. The following procedures must be repeated for all piles driven for the entirety of the onsite piling program.

### **2.1 ENVIRONMENTAL OBJECTIVES**

Environmental objectives achieved through implementing this Protocol will be:

- ▶ No harm to any individual conservation significant fauna species (target marine fauna);
- ▶ No reduction in populations of species of local and regional importance; and
- ▶ No reduction in the biodiversity of marine fauna in the Development Envelope or surrounds.

The management and monitoring procedures outlined in this document will achieve the above environmental outcome/s by providing an easy-to-follow guide for construction personnel to use during piling which poses a significant risk to the marine fauna factor. Conservation significant fauna are species listed as threatened or migratory under the EPBC Act, or the WA Biodiversity Conservation Act 2016 (BC Act) as threatened or priority species; target commercial or recreational fish species; and have a high likelihood of occurrence withing the AIP DEs.

## **3 Management actions**

A summary of environmental management is presented in Table 1Table 1. The procedural steps detailed within this section are to be implemented by onsite construction personnel in full for each instance of piling. The procedures must also be repeated for all piles driven for the entirety of the onsite piling program.

**Table 1 Environmental monitoring and management for marine fauna**

<b>Marine Fauna</b>				
Objective	<ul style="list-style-type: none"> <li>• No harm to any individual conservation significant fauna species;</li> <li>• No reduction in populations of species of local and regional importance; and</li> <li>• No reduction in the biodiversity of marine fauna in the Development Envelope or surrounds.</li> </ul>			
Management strategy	Reducing potential impact to target marine fauna, particularly from noise from piling by implementing this Underwater Noise Management Procedure and implementing associated management and mitigation controls.			
	<b>Management action</b>	<b>Responsibility</b>	<b>Timing</b>	<b>Item</b>
	Implement effective noise dampening measure.	Contractor	During piling activities	1.1
	Limit piling to daylight hours only when marine fauna observations can occur.	Contractor	During piling activities	1.2
	Trained marine fauna observers to be used prior to and throughout piling operations (See Section 6.1)	Contractor / MinRes	Prior to piling and during piling	1.3
	Maintenance of observation and exclusions zones (see Section 4)	Contractor and MFOs	During piling	1.4
	Implement Soft-start procedures (see Section 5.1)	Contractor and MFOs	During Piling	1.5
	Implement shut down procedures (see Section 5.4)	Contractor and MFOs	During Piling	1.6
Performance indicators(s)	No incidents of target marine fauna injury or death as a result of underwater noise emissions.	Contractor	During Piling	1.7
Monitoring	Marine fauna observations shall be undertaken for the duration of piling.	Contractor and MFOs	During Piling	1.8
	Validate the noise model and associated management zones	MinRes	During initial piling	1.9
Reporting and recording	Incident: injured wildlife to be reported to Contractor PM. The PM is to notify MINRES who will notify	MFOs, Contractor and MinRes	Without delay	2.0

	the Department of Biodiversity Conservation and Attractions (DBCA).			
	Incident: non-compliance to be reported to Contractor Project Manager (PM).	MFOs, Contractor	Without delay	2.1
	Data sheets will be used throughout the day to record effort, sightings and mitigation actions.	MFOs	Daily	2.2
	Brief summary report of operations, sightings, and mitigation actions to be provided to Contractor PM.	MFOs	Daily	2.3
	Full summary report of operations, sightings, and mitigation actions to be provided to Contractor PM and MINRES.	MFOs, Contractor	End of program	2.4
	Full summary report of operations, sightings, and mitigation actions to be provided to DBCA and the Department of Agriculture Water and the Environment (DAWE).	MinRes	End of program	2.5
Corrective actions	Assess marine fauna incident and modify and adapt management where necessary.	MinRes	Without delay	2.6

**3.1 TIMING OF WORKS**

The piling campaign has been planned to occur between January 2023 and March 2023, in the attempt to avoid the peak southern humpback whale migration season (i.e., mid August to early September; Chevron 2021).

Piling will occur during daylight hours unless in the case of a safety/emergency; at such times it will not extend beyond 6:30 pm.

One pile is expected to be driven per day, with a total hammering time of two to three hours, and no more than six hours per pile. At this rate, the full campaign (expected to be of 57 piles) is anticipated to take 100 days.



#### 4 MANAGEMENT ZONES

Two Management Zones have been set for target marine fauna groups, namely:

- ▶ Observation Zones
- ▶ Exclusion Zones

**Observation Zones** are based on the modelled Temporary Threshold Shift (TTS) onset distance for each fauna group. **Exclusion zones** are based on the Permanent Threshold Shift (PTS) onset distance for each fauna group (Table 4).

**Table 3 Piling Noise Impacts to Marine Fauna (Modified from Talis 2022)**

Marine Fauna Group	Tide	Distance to Piling Activities (m)		
		TTS distance limit	PTS distance limit	Behavioral response
Whales	Low	840	140	5,400
	High	1,440	225	15,000
Dolphins	Low	35	No exceedance	70
	High	40	No exceedance	1430
Dugongs	Low	15	No exceedance	70
	High	10	No exceedance	1430
Turtles and Sawfish	Low	100	<20	200
	High	215	<20	420

**Table 4 Recommended Piling Observation Zone and Exclusion Zone distances for each marine fauna group (based on Talis, 2022).**

Marine fauna group	Piling Observation Zones	Piling Exclusion Zones
Whales	1,500 m	300 m
Dolphins	500 m	150 m
Dugongs	500 m	150 m
Turtles	500 m	200 m

*Note: Sawfish are not included in the marine fauna observation procedures because they are highly cryptic and unlikely to be detected by observers. Construction piling will be undertaken outside of sensitive life periods (i.e., pupping) where practicable.*

These distances adopt a precautionary approach to the management zone distances, by using management zone distances from the ‘high tide’ modelled scenario where noise propagates the farthest. The adopted zones are broader than the model outputs suggest the zones need to be, based on PTS and TTS distances. The observable distances are easily achievable. The **Observation Zones** have been informed by the TTS distances (Table 3; Talis 2022) and will be implemented so piling can only commence when all marine fauna are outside their respective TTS ranges. The **Exclusion Zones** have been informed by the PTS distances, if species enter their respective **Exclusion Zones** piling must stop, piling can only recommence once the animal

moves outside its respective Observation Zone. With the use of piling soft-start procedures, MFOs and planning of the piling campaign to avoid peak southern humpback whale migration season will all help prevent negative interactions.



Figure 1 Marine Fauna Management Zones - Piling



## 5 PROCEDURES

### 5.1 Pre-Start Procedures

Prior to piling works each day the dedicated MFOs will commence continuous visual observations within the observation zone for 30 minutes. MFOs must have sight lines of the Piling **Observation Zone**, enabling them to effectively manage the disturbance distances. MFOs in conjunction with piling contractors and the contract project manager will carry out the following duties and comply with the following protocols in regard to pre-start procedures:

- ▶ If target marine fauna is not observed within the either the **Exclusion** or **Observation Zone** within 30 minutes, piling operations may commence with soft-start procedures.

### 5.2 Soft-Start Procedures

Soft-start involves the commencement of piling at low hammer energy, gradually increasing to full impact energy over a 30-minute period. This procedure may alert marine fauna to the presence of the piling activity and enable them to move away to distances where injury is less likely. The MFOs will continually monitor management zones during soft-start procedure.

- ▶ If target marine fauna are observed in the **Observation zone**, soft-start procedures will continue and the marine fauna observer will continue to monitor the marine fauna. If target marine fauna are observed in the **Exclusion zone**, soft-start procedures will cease until the observed target marine fauna leaves the exclusion zone target or have not been seen for 30 minutes, on completion of the 30 minutes duration and no animal has been observed in the exclusion zone soft-start procedures will recommence

### 5.3 Dynamic Piling

Dynamic load testing is a method to assess a pile's bearing capacity by applying a dynamic load to the pile head (a falling mass) while recording acceleration and strain on the pile head. Dynamic load testing for steel piles is performed during installation. Dynamic load testing requires the pile hammer to perform a full power strike. Consequently, a soft start is not suitable for the piles subject to dynamic load testing. Approximately 25% of the piles will require dynamic load testing.

- ▶ If target marine fauna is not observed within the management zones within 30 minutes, then dynamic piling operations may commence without soft start procedures.

### 5.4 Piling and Shut Down Procedures

The MFOs will maintain continuous observations during piling. They will notify the contract project manager if fauna is observed within the corresponding **Observation** or **Exclusion Zone**. Piling will cease as soon as sighting information has been relayed to the person responsible for piling operations, and the instructions to stop are provided.

Where target marine fauna are observed within the **Observation Zones** (but outside the **Exclusion Zones**) during piling activities (including Soft-Start procedures), then following action shall be taken:

- ▶ If target marine fauna are seen within the **Observation Zones** (but outside the **Exclusion Zones**), piling activities will continue and the MFOs will continue to monitor to ensure it the observed fauna do not enter the exclusion zone.
- ▶ Piling will continue unless on advice from the MFOs that the target marine fauna is exhibiting Project related stress, then piling operations shall cease until marine fauna have exited the management zones or have not been seen for 30 minutes.

Where target marine fauna is observed within the **Exclusion zones** during piling activities (including Soft-Start procedures), then following action shall be taken:

- ▶ Piling works will cease when targeted marine fauna is identified within, or about to enter, the **Exclusion Zone**.
- ▶ Piling activities that have been suspended must not recommence until the target marine fauna has exited the corresponding **Exclusion Zone** off its own accord or has not been seen by the MFO within these zones for a period of 30 minutes.
- ▶ Once able to resume, piling will recommence following soft-start procedures.

## 5.5 Low-Visibility Conditions

During periods of low visibility (i.e., poor weather conditions such as fog, rain or thick smoke, where the **Observation Zone** cannot be clearly viewed out to 3 kilometres), then piling operations may commence with soft-start procedures, provided that during the preceding 24-hour period:

- ▶ There have not been three or more circumstances where marine fauna has been observed in, or about to enter, the **Exclusion Zone** which resulted in stopping piling works;
- ▶ There have not been three or more whale instigated shut-down situations;
- ▶ A 2-hour period of good visibility has been maintained prior to onset of low visibility and no marine fauna were sighted;
- ▶ If marine fauna is detected in the shut-down zone during poor visibility, operations must stop until visibility improves to enable full visual monitoring of the management zones;
- ▶ Piling will be restricted to daylight hours only and these hours will vary depending on the time of year piling is undertaken. (Unless in the case of a safety/emergency)
- ▶ If marine fauna are detected, the Shut-Down Procedure (section 5.4) will apply.

## 6 MARINE FAUNA OBSERVERS

### 6.1 Training and qualifications

For piling two dedicated MFOs will be used prior to and throughout piling operations.

Dedicated MFOs are suitably trained, and dedicated persons engaged to undertake marine fauna observations and mitigation measures associated with construction pile-driving. The person will have demonstrated knowledge and experience in marine fauna species observation, distance estimation and reporting. They will not have other duties while engaging in visual observations.

Dedicated MFOs will be suitably trained and qualified, adhering to the requirements of the Wildlife Conservation (Closed Season Marine Mammals) Notice 1998. MFOs must demonstrate a knowledge of marine wildlife species in the North-west region, including Threatened and Migratory Species listed under the EPBC Act, and BC Act and priority listing, including morphological and behavioural characteristics.

Evidence of personnel suitability will be kept on record through staff curriculum vitas, training certificates and in-field record keeping, which may be used in future audits. Information will include:

- ▶ MFO names and contact details;
- ▶ Details of MFO training (including provider and course dates);
- ▶ Previous experience as MFO on piling surveys; and
- ▶ Other MFO experience.

### 6.2 Shifts

MFOs shifts will be set prior to field mobilisation to prevent observer fatigue which can reduce the quality of observations and data recording. From a health and safety perspective, having coordinated shifts will ensure that observers have amenity breaks and reduced weather exposure.

### **6.3 Platform**

MFOs observations will be undertaken from a suitable elevated point that provides appropriate vantage of the Management Zones and with 360-degree views around the noise source. This point may need to shift pending the location of the noise source on any given day (i.e., site construction activities).

### **6.4 Field log**

Throughout all operational piling procedures MFOs will record observer effort, fauna observations and mitigation measures. All records will be sent to DBCA and DAWE (Ports and Marine Section). Field logs will include:

- ▶ Location, date and start time of observation
- ▶ Name of MFOs involved in the observation
- ▶ Start / finish time of piling activities
- ▶ Other target marine fauna observations within 500m of piling operations
- ▶ Fauna behaviors, in particular any behaviors that could be attributed to piling activities
- ▶ Location, times and reasons when observations were hampered by poor sighting conditions
- ▶ Location and time of start-up delays, power downs, or stop work procedures as a result of marine fauna sightings
- ▶ Location, time and distance of any fauna sightings including species where possible.
- ▶ Adherence to management responses in relation to dead and injured wildlife, including suspension of piling and;
- ▶ Observed cetaceans in a format consistent with the National Cetacean Sighting and Stranding's Database

### **6.5 Reportable instances**

- ▶ All employees of MinRes and Contractor shall immediately report all environmental incidents as a non-conformance (i.e., performance indicators are not met or management actions are not followed) to the Contractor site supervisor who will investigate the incident with both the Contractor Project Manager and MINRES Project Manager.
- ▶ Reportable incidences are injury to wildlife as a result of the Proposal activities or general observations of injured wildlife not related to Proposal activities to be reported to Contractor PM. The PM is to notify MINRES who will notify the Department of Biodiversity Conservation and Attractions (DBCA).

It is a requirement that all incidents follow MINRES's incident Management Procedure. The employee is to report the incident immediately to the site supervisor. In every case the site supervisor is to document the incident using MINRES's Incident Management System.

### **6.6 Completion report**

Full summary report of operations, sightings, and mitigation actions to be provided to MinRes in accordance with the requirements in Table 3.

On completion of the program MinRes will provide a full report to both DBCA and the Department of Agriculture Water and the Environment (DAWE).

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## **7 ADAPTIVE MANAGEMENT AND REVIEW OF PROCEDURES**

Adaptive management will be incorporated through the validation of noise levels and the associated management zone distances.

A handheld hydrophone will be used to measure noise generated by the first piling event. This will test the accuracy of the noise models and/or other engineering mitigation measures. Based on the results, observation and exclusion zones will be altered accordingly.

## 8 REFERENCES

Talis Consultants. Underwater Noise Modelling- Ashburton Infrastructure Project (2022). Prepared for O2 Marine on behalf of Mineral Resources Limited.

Chevron (2021). Wheatstone Development EPBC Reference 2008/4469 Compliance Assessment Report 2021 (p.13-14)

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