

ATTACHMENT 1 (TABLE 3) - SUBSEA 7 RESPONSES TO COMMENTS FROM EPA SERVICES ON AMENDED ENVIRONMENTAL MANAGEMENT PLANS

Section/reference	EPA Services Comment on Response	Response
Marine Fauna Environmental Management Plan		
Tables 10/11	<p>These tables in section 2.2 need to stand alone and have appropriate level of detail regarding the management actions. At present, the reader needs to cross reference numerous sections to understand the basics of the management actions.</p> <ul style="list-style-type: none"> • These tables do not provide the same level of detail as each other and the details provided in Attachment 1 (e.g. size of observation zones). Please include a succinct summary of the size of the observation zones in Tables 10/11. • Please specify the no launch period in this table and then refer to the note. • The use of marine fauna, marine mammals and subnote 4 regarding dolphins and turtle in Table 10 are overly confusing. Use of the marine mammals with footnote would remove a redundant phrase. 	<p>Tables 10 and 11 have been updated to include additional details.</p> <p>The definition of marine fauna, and footnotes 1 and 4, have been revised.</p>
Section 3.4	EPA services requested that MFOs log all interactions with marine fauna during construction and operation (item 23 in the Response table), and Subsea 7 agreed to this and referred to section 3.4. This section related to death or injury of marine fauna and not recording the marine fauna interactions. Please update item 23 and include in the plan the details that MFOs will log during construction and operation.	Section 3.4 of the MFMP has been retitled and updated to specify that MFOs will log all interactions with marine fauna during construction and operation.
Attachment 1	<p>Surface tow procedure, continue with tow box:</p> <p>To get to this box, a marine mammal must not be sighted within 1000 m. However the 'actions' within this box for the MFO is to only monitor the Exclusion Zone (500 m). Should the MFO be monitoring the Observation Zone?</p>	The Surface tow procedure in Attachment 1 has been revised to include monitoring of the observation zone.
Whale sharks	<p>Further references to whale sharks are required:</p> <ul style="list-style-type: none"> • The Subsea 7 objectives in section 1.3 do not refer to whale sharks given the definition of marine fauna provided in section 1.1. This is also relevant in the summary. • In the summary, the "key provisions in the plan" section only refers to the use of a marine fauna observer (MFO) for mammals and should also include whale sharks. • Please review the plan and ensure the commitments in the "Note on spotter plane to mitigate risk to whale sharks" are incorporated into the body of the plan, such as in the objectives. • Attachment 1 does not refer to whale sharks, but they are referred to in Table 11 	<ul style="list-style-type: none"> • The definition of marine fauna has been clarified. • Section 1.3 has been updated. • Whale sharks have been added under 'key provisions'. • The objective of the spotter plane has been added into Table 11. • Attachment 1 has been revised to include Whale sharks.
Listed marine fauna	<p>It is noted that the term <i>listed</i> marine fauna was deleted from some parts of the plan between versions but not others. For example</p> <ul style="list-style-type: none"> • Management action in Table 6, column 1 refers to only <i>listed</i> marine fauna but it was deleted from other tables, such as table 6, column 3. • Section 3.4 refers to reporting injury or death for <i>listed</i> marine fauna. <p>This does not seem consistent with the definition for marine fauna provided in section 1.1</p>	The MFMP has been reviewed and references to listed species amended.
No launch period	Noting the comments provided by the Department of Agriculture, Water and the Environment (DAWE) and the results of the noise modelling for behavioural response, EPA Services also recommends extending the no launch period to include July – October.	MFMP has been updated to nominate an extended 'no launch' period (July to October).
Minor matters	<ul style="list-style-type: none"> • Section 1.4 – please write 'benthic communities and habitat' in full the first time used in the document • Section 1.5.1.1 – typographical error "interesting habitat" • Section 1.5.1.5 – please include a succinct description of permanent and temporary threshold shifts 	These issues have been updated/corrected.
Marine Construction Monitoring and Management Plan		
General	<p>The MCMMP currently does not include Environmental Protection Outcomes (EPO's). The following EPO's are suggested.</p> <ul style="list-style-type: none"> • Impacts to BCH within the ZOMI are recoverable within five years. • No Impact to BCH in beyond the ZOMI. 	The MCMMP has been updated to include the nominated EPOs.
Section 1.2.2	This section states 'launchway construction activities will be limited to daylight operations (day shift) only'. Section 5 (stakeholder consultation) states 'the vast majority of site operations and construction activity would be performed during daylight hours, thereby limiting the lighting requirements for the site'. Please clarify when construction is taking place.	Section 5 has been modified to clarify the timing of launchway construction activities (daylight only).
Section 2.1.3.1 PAR	<p>In the MCMP it is stated:</p> <p>"Calibrated hand-held monitor used to determine light (PAR) levels at 1 m above seabed at sites at the 50 m boundary, and at reference sites. This will be undertaken daily, between 10am and 2pm, during or immediately following any turbidity-generating works.</p> <p>The PAR should be measured as close to the seabed as possible not 1 m above.</p> <p>The data from the reference sites needs to be collected using a logger to determine baseline levels. This data needs to be collected over a period of time and the 20th percentile calculated. More information is required regarding how the 20th percentile will be determined. For example will only the data collected between 10am and 2pm be used to determine the baseline levels? It also needs to be stated in this section over what time frame the baseline data will be analysed e.g. 3 days.</p>	A distance of 1 m above the seabed was chosen to avoid the issue of sediment resuspension from the PAR sensor weight (if it touches the seabed during logger deployment). However, given the BCH type at the proposed monitoring sites this is likely to be a minor issue. Section 2.1.3.1 of the MCMMP has been updated to specify 'Calibrated hand-held monitor used to determine light (PAR) levels at 0.5 m above seabed'.

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	Please update all tables relating to this methodology to ensure consistency.	Section 2.1.3.1 of the MCMMP has been updated to specify more detail regarding the calculation of the 20th percentile value.
2.1.3.2	The MCMMP states: “The expected statistical power of the survey design to detect a change of >10% will be confirmed following the completion of the baseline survey”. It is recognised that it is difficult to monitor benthic communities particularly those that are flexible and move with the currents (e.g. macroalgae), and a target level of change >10% may not be feasible. A target level of change of 20% may be acceptable. This level of change applies to the BCH monitored in the ZOMI only.	Noted. Section 2.1.3.2 of the MCMMP has been updated to reflect a target level of change of 20%.
Table 5	<ul style="list-style-type: none"> Table 5 Monitoring Programme Summary, states that water quality monitoring will be undertaken in the ZOMI. Water quality monitoring is not essential in the Zone of Moderate Impact, however it is required at the ZOMI/ZOI boundary. The area of the ZOMI is relatively small and the main requirement is that impacts to BCH are recoverable within five years. Table 5 also states that PAR levels will be measured daily. It is currently unclear if the PAR measurements will be conducted daily throughout construction or in the event that silt curtains cannot be deployed or are ineffective. Please clarify. What is ‘persistent turbidity’ at the 50m boundary that will result in management actions. There is currently an inconsistency between Table 5 and Table 2 regarding the BCH monitoring frequency. Please include that monitoring will be completed within one month in Table 5. 	<ul style="list-style-type: none"> Noted. The MCCMP has been updated. Table 5 has been clarified to specify that daily PAR measurements will be undertaken only in the event that visual monitoring indicates elevated turbidity beyond 50 m (i.e. in the event that silt curtains cannot be deployed or are ineffective). ‘Persistent turbidity’ has been defined in the MCMMP as a duration of greater than 3 days (footnote to Section 1.3.1). Text within Table 5 has been amended to clarify PAR monitoring in the event that elevated turbidity beyond 50 m is recorded during more than 2 consecutive visual monitoring events (i.e. elevated turbidity over a single day would not trigger a PAR assessment but elevated turbidity continuing to the following day would trigger a PAR assessment). Table 5 and Table 6 have been updated to reflect differing timeframes for post-construction monitoring within the ZoMI (1 year) and beyond the ZoMI (1 month).
Table 6	The following management target is stated in Table 6. No significant increase in turbidity (beyond background) associated with launchway construction beyond immediate surrounds (50 m) of construction area This should be reworded to: No significant increase in turbidity (<u>compared to unimpacted reference sites</u>) associated with launchway construction beyond immediate surrounds (50 m) of construction area.	Noted. Table 6 has been updated as recommended, with the word ‘persistent’ added to align with the current management objective of ‘ <i>No significant and persistent increase in turbidity (compared to unimpacted reference sites) associated with launchway construction beyond immediate surrounds (50 m) of construction area</i> ’.
Zones of Impact	Please provide an in-text description of the extent of the Zone of High Impact and Zone of Moderate Impact (ZoMI). It is not clear (although assumed) that the 50 m monitoring boundary is the edge of ZoMI.	New Section 1.4.2 added.
General	Please update the section numbering within the document	Section numbering has been updated.
Marine Operational Monitoring and Management Plan		
Section 2.1	It is recommended that one additional objective is added: To quantitatively assess the spatial extent of the Zone of High Impact.	The MOEMP currently has the following objectives which are considered to cover the assessment of the ZoHI: <ul style="list-style-type: none"> Evaluate impacts on BCH during Bundle launch and relate to those predicted in the ERD (Subsea 7 2019). Compare any significant changes to BCH attributed to the Proposal (i.e. impacts) to the predicted impacts and approved environmental protection outcomes (EPOs). The proposed ‘physical monitoring’ is deemed semi-quantitative, which is considered appropriate to verify the extent of the ZoHI following a launch. No changes to the MOEMP are proposed.
Section 2.2.1	The monitoring summary implies that biological monitoring will post every launch. Please revise wording to accurately reflect the biological monitoring that will occur.	Table 2 has been updated.
Section 2.2.2	To assess the footprint of physical contact it is recommended that the towed video surveys are undertaken at least three locations in the area of chain drag in the Off Bottom Tow Area and at least three locations three locations in the Parking Area. A figure should be included to show the indicative sites where monitoring will occur.	The MOEMP has been amended to include the recommended six ‘Physical Monitoring Transects’ as suggested, and a figure (Figure 4) has been prepared to show the indicative transect locations. The start and end

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	<p>To assess the impacts to marine infauna and the potential recovery of these communities it is recommended that one location is monitored in the area of train drag in the Off Bottom Tow Area and one location in the Parking Area. It is recommended that at each location there are five replicates approximately 50-100m apart. It is likely that fauna and bioturbation will vary with depth, and if the towed video transects are located too far apart they are unlikely to act as true replicates.</p> <p>The timing of surveys should be adjusted to more accurately capture physical impacts and potential recovery. It is recommended that the video data is collected once immediately prior to the launch (i.e. up to a week prior), immediately after the launch (up to three days afterwards) and after four months.</p>	<p>points for each transect will be selected following review of the GPS tracklog from the lead and trail towheads.</p> <p>To assess the impacts to soft sediment communities, and their recovery following physical disturbance (by the Bundle chains), the MOEMP has been amended to include the collection of five replicate video transects at each of two 'Soft Sediment Recovery Monitoring Sites', one within the Off Bottom Tow area and one within the Parking Area (Figure 4). The timing of the surveys has been revised as recommended.</p>
Section 2.2.3	<p>It is recommended that the MOEMP include additional water quality monitoring sites along the tow path to provide a more detailed and accurate understanding of the turbidity plume. It is recommended that four additional sites are added, approximately half-way and three-quarters of the way along the tow route and within the ZOI in the southern gulf (i.e. not the Parking Area Zol). Sites should be located both north and south of the tow route. Information from these sites should provide useful validation data for the model and also could assist in determining whether any changes observed through the long term monitoring program are likely to be project attributable or not. They will also assist in providing confidence regarding the impact predictions and the data can be used to inform the number of years monitoring would be required (should the EPA determine that the proposal may be implemented subject to conditions).</p> <p>It would also be useful to have additional sites outside of the ZOI determine if water quality is affected beyond the model predictions. Currently there are two sites proposed outside of the ZOI – (Sites 5 and 7). Additional loggers located outside of the Zone of Influence could be useful to provide additional data which maybe used to address community concerns about the extent of the plume.</p>	<p>Subsea 7 considers that the proposed quantitative monitoring (loggers) at sensitive receptors, together with the qualitative monitoring (aerial imagery), is sufficient to characterise the spatial extent and persistence of elevated turbidity and the risk of impact to BCH.</p> <p>Notwithstanding, Subsea 7 has amended the MOEMP to include the recommended additional water quality monitoring sites (Figure 6).</p>
Section 2.2.4	<p>The MOEMP states "In the event of a statistically significant difference in the cover/abundance of macroalgae or corals, then a full comparison with reference site data will be completed".</p> <p>Please clarify what how will this be done. For example, what statistics will be used and will it be based on % cover, number of organisms (or both)? Will this involve a site by site analysis? What level of statistical significance will be tested?</p>	<p>It is expected that percentage cover, rather than abundance, will be assessed, as both CPCe and TransectMeasure allow the overlay of user-defined dots on stills and video imagery, respectively, and support a 'cover' assessment approach.</p> <p>It is proposed that sites be initially assessed in isolation (i.e. has the dominant group at Site 2 declined by greater than 20%?), with subsequent comparison to reference site data if required. The original sentence '<i>The mean cover/abundance of the dominant group (as determined during the baseline survey) at each site post-launch within the Zol will be compared to the data obtained during the baseline survey</i>' was attempting to communicate this approach.</p> <p>It is difficult to nominate the exact statistical tests until the data has been collected and analysed by the specialist consultants.</p> <p>A target level of change of 20%, as suggested below, is likely to be achievable and has been nominated within the MOEMP.</p>
Section 2.2.4	<p>The MOEMP also states "The expected statistical power of the survey design to detect the target level of change (a change of >10%) will be confirmed following the completion of the baseline survey".</p> <p>It is recognised that it is difficult to monitor benthic communities particularly those that are flexible and move with the currents (e.g. macroalgae), and a target level of change >10% may not be feasible. A target level of change of 20% may be acceptable.</p> <p>EPA Services notes that the report does not clearly identify which are the BCH reference sites. Presumably these are sites 1 and 6. It is recommended that the reference sites are located far from the ZOI in the event that the plume extends further than model predictions. It is recommended that reference sites are located in similar habitat and depth, but at least 3 km north or south of the ZOI.</p>	<p>Noted. Section 2.2.4 of the MOEMP has been updated to reflect a target level of change of 20%.</p> <p>An initial assessment of water quality data from the Zol and beyond Zol sites (Figure 5) will demonstrate whether significant changes in turbidity have occurred at these sites following a Bundle launch, and whether there is a risk of impact to BCH. In the event that turbidity within the Zol is found to have exceeded the threshold, then a site by site analysis of BCH monitoring data (Sites 2,3,4,5,7,8 (Figure 7)) will be completed.</p> <p>Only in the event that this analysis indicates an impact to BCH within the Zol will 'reference' data from Sites 1 and 6 be used. The water quality data will demonstrate whether these</p>

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		<p>sites may have been compromised by elevated turbidity in exceedance of the threshold.</p> <p>Sites 1 and 6, located off Wapet Creek and >3 km north of the tow route, are considered unlikely to be impacted by elevated turbidity during/following a Bundle launch. It is noted that no BCH comparable to that found off Heron Point is known beyond the Heron Point/Wapet Creek area. In the event of a significant impact to BCH within the Zol, it is likely that the relevant EPO has not been met.</p>
Section 3.2	<p>The MOEMP states: "In the event of a non-compliance or exceedance of an EPO additional management measures, to address that non-compliance or exceedance, will be included within a revised plan".</p> <p>It is recommended this sentence is changed to: "In the event of a non-compliance or exceedance of an EPO additional management measures, to address that non-compliance or exceedance, will be included within a revised plan <u>prior to the next launch.</u>"</p>	<p>Agree.</p> <p>The MOEMP has been revised as suggested.</p>
Marine Emergency Response		
Other approvals	<p>Please provide further information regarding any other approvals, regulations or plan that will be required for towing operations within State/Commonwealth waters.</p> <p>Please also provide further information on any other approvals, regulations or plans that may be required should a maritime emergency occur, including for example</p> <ul style="list-style-type: none"> - a release of a potential contaminant into the marine environment, and - a loss of bundle control <p>noting that such incidents may generate or require a different level of response.</p>	<p>Additional information has been added to the MERP (Section 2.2) including the need for a Shipboard Oil Pollution Emergency Plan.</p>