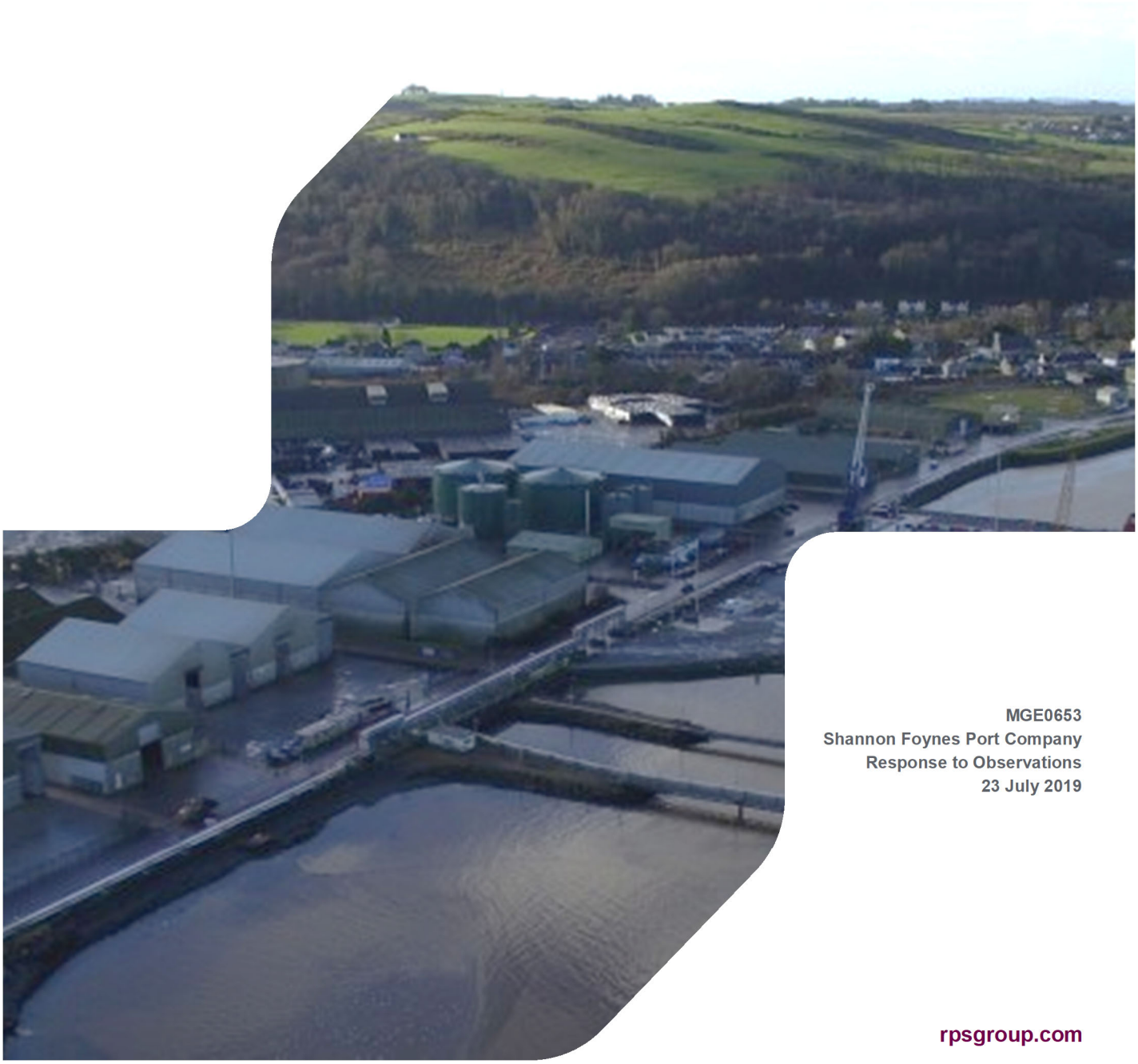
SHANNON FOYNES PORT COMPANY
FORESHORE LICENCE APPLICATION

Response to Consolidated Prescribed Bodies Observations



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Response to Observations
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1 BACKGROUND

Shannon Foynes Port Company has applied for a foreshore licence to carry out a jetty extension at Foynes Port (reference number FS006837). This project will require construction, including piling on the foreshore in the port area.

A report detailing the Consolidated Prescribed Bodies Observations was provided by the Marine Environment and Foreshore Section of DoHPLG on 26th July 2019.

Submissions relating to piling were submitted by Inland Fisheries Ireland (IFI), in particular in respect of the underwater noise arising from piling operations. These are summarised below:

1. Mitigation Measures detailed in Section 5.2 (of the Natura Impact Statement) are satisfactory and shall be carried out in full.
2. No specific piling mitigations are proposed. Marine mammal observer (MMO) proposal is standard. This has a value in, potentially, providing for time breaks in the piling process.
3. IFI would propose that mitigations to reduce any adverse impact of noise dispersion into the aquatic environment would be included in the foreshore licence conditions.
4. It is noted that MMO is proposed, as is use of vibrating piling. IFI enquires as to why drilling into rock is not undertaken, as opposed to hammer action piling.
5. Mitigation measure to reduce levels of noise dispersion and adverse impact on fish should include:
    a. The practice of “ramping up” when starting each pile driving event, in order to “warn” the fish and marine mammals in the area. This start-up strategy should be employed each time the pile driving is initiated. It is common practise with MMO and may be inherent in mitigation proposals here.
    b. Use of bubbler curtain around the immediate area of pile driving in order to reduce noise dispersal into the aquatic environment.
    c. Use of vibrating hammer (as proposed) to be made for pile driving in order to reduce noise generation and propagation.
    d. Extended time period to drive individual piles (as envisaged here – reference to 4 x days per pile in text).
    e. Piling for limited time period each day and during daylight hours only – a large degree of migratory movement of fish occur in the hours of darkness.

Each of these submissions are responded to in turn in this report.

2 RESPONSE

1. Mitigation Measures in Section 5.2

The mitigation measures outlined in Section 5.2 of the Natura Impact Statement submitted with the planning application (An Bord Pleanála Reference ABP-301561-18) and the Foreshore Licence application (FS006837) include inter alia the following measures to protect marine mammals and fish species:

- *NPWS Guidance to Manage the Risk to Marine Mammals from Man-made Sound Sources in Irish Waters (NPWS, 2014) shall be implemented.*
- *A Marine Mammal Observer (MMO) shall be employed to ensure the marine piling area is clear of marine mammals prior to the commencement of piling activities.*
- *A soft start procedure will be used where the equipment is ramped up slowly to full power.*
- *The buffer zone to be monitored will be outwards to 1,000m in line with DoEHLG (2007) guidance Code of Practice for the Protection of Marine Mammals during Acoustic Seafloor Surveys in Irish Waters unless otherwise agreed with NPWS.*
- *Visual mitigation measures require daylight and favourable sea conditions in order to be implemented effectively. Bottlenose dolphins are quite easily detected in good to moderate sea-states and the port area is quite sheltered from all wind directions. The MMO can work effectively from land, with a suitable Vantage Point. This is consistent with MMO mitigation measures implemented as part of the most recent port project.*

These measures are included in the schedule of commitments proposed by the Developer and as such will be implemented on the Project.

2. No specific piling mitigations are proposed. Marine mammal observer (MMO) proposal is standard. This has a value in, potentially, providing for time breaks in the piling process.

Piling mitigation commitments are set out in Section 7.4.5 of the EIAR and Section 5.2 of the NIS and include the implementation of the NPWS (2014) guidelines which require:

- A Marine Mammal Observer (MMO) to ensure the area is clear of marine mammals; and
- A soft start procedure where the equipment is ramped up slowly to full power.

These mitigation measures have been widely used in the Shannon Estuary and elsewhere to mitigate any effects on marine mammals. Previous projects include during reclamation works behind the East Jetty in Foynes Port, dredging at Aughinish Alumina, Kilrush Marina and Endesa Power Plant at Tarbert and piling for the wind turbines at Moneypoint.

Both measures will provide breaks in the piling process.

As stated in both the EIAR and the NIS, piling will only take place between the hours of 08:00 and 18:00 on Monday to Fridays, between 08:00 and 13:00 on Saturdays and there will be no activity on Sundays or Bank Holidays. These operating hours clearly provide a break from 18:00 hrs through the night to 08:00 hrs each day with longer breaks over the weekend.

As stated in the EIAR (Section 7.4.1.2) bottlenose dolphins have been detected in the Foynes area predominantly at night (76% of detections). Section 7.3.3.2 of the EIAR points out that both eels and lamprey tend to migrate after the day period. The avoidance of piling at night provides a clear protection to these species. The likelihood for Atlantic Salmon species is that they will use main navigation channel where the highest current speeds prevail (outside the Foynes side-channel) as stated in Section 7.3.3.2 of the EIAR.

Piling activity is intermittent (50% of the time) during the day period as stated in Section 11.2.4.2 of the EIAR.

3. IFI would propose that mitigations to reduce any adverse impact of noise dispersion into the aquatic environment would be included in the foreshore licence conditions.

The proposed mitigation measures in the EIAR and the NIS will be implemented as part of the project.

4. It is noted that MMO is proposed, as is use of vibrating piling. IFI enquires as to why drilling into rock is not undertaken, as opposed to hammer action piling.

As stated in Section 2 of the EIAR tubular steel piles will be installed to a depth determined by a combination of factors including; the local bedrock level, condition of the bedrock, the condition of the overlying material, the imposed quay loadings and the final geometry of the selected pile profile.

Based on available geotechnical information it is anticipated that the tubular steel piles will be installed to depths ranging between -30mCD (Chart Datum) and -35mCD (i.e. between circa –33mOD Malin and -38mOD Malin), with the final depths depending on the local ground conditions and proximity to the standard dredge depth. It is envisaged that piles will be driven to provide approximately 3m deep penetration into rock.

Section 2.2.5 of the EIAR states *'Heavy piles such as this will sink several metres when lowered vertically to the seabed. A vibratory pile driver will then be used to drive the piles as far as possible. It is likely however that at least half of the pile driving will require an impact hammer to drive the piles into rock. The total duration of the piling activity will be approximately 10 months, meaning that on average it will take about 3 working days to complete a pile. The pile is lifted into place, aligned and lowered slowly into position. The vibratory driver is then brought into position and begins to vibrate the pile into position. Initially there will be multiple stops for alignment checks. Gradually the pile is secured and vibrated for longer periods. At some point the vibratory driver will cease to be effective and the impact driver will be brought into position. Due to the length of the piles it is likely that the piles will be installed in sections so further time is required to weld extension sections to the pile. Piling will likely be undertaken from a jack-up barge using a single crane, with a change-over in operations*'.

RPS referenced similar piling works at Dublin Port in Section 11.2.4.4 of the EIAR. Site investigation information has shown that the upper layers of sediment at Foynes are softer than at Dublin Port and so we anticipate that penetration under self-weight will be higher at Foynes, as evident from nominal to low Standard Penetration Test values in the upper clay material.

Subject to confirmation from the piling sub-contractor, the sediments experienced at Foynes are likely to require a 'ramped start' with approx. 10% of the hammer weight applied during initial driving, as applying the full hammer weight to the pile through the upper layers of sediment would be an inefficient use of the piling hammer.

The intention is to use vibration piling to advance the piles through the upper soft sediments, with impact driving only used through the underlying granular strata until pile refusal at rock horizon. The final stage of rock socketing of the pile within the rock stratum will be undertaken using drilling.

The impact piling is limited to the coarse sands and gravel stratum as opposed to impact driving through competent rock.

5. Mitigation measure to reduce levels of noise dispersion and adverse impact on fish should include:

a. The practice of "ramping up" when starting each pile driving event, in order to "warn" the fish and marine mammals in the area. This start-up strategy should be employed each time the pile driving is initiated. It is common practise with MMO and may be inherent in mitigation proposals here.

As stated in Section 4 above, a soft start with the initial application of approximately 10% of the full energy at commencement, ramping up as required, will be implemented. Where short breaks are required for alignment checks it is not proposed to restart with a soft start. Where breaks are longer than 30 minutes a soft start will be used.

b. Use of bubbler curtain around the immediate area of pile driving in order to reduce noise dispersal into the aquatic environment.

It has been clearly demonstrated in the EIAR and the NIS (and summarised in this response) that the risk of underwater noise to protected species is not significant. Bubble curtains have been developed as a potential mechanism for mitigating piling noise, particularly for offshore wind turbine foundations in the North Sea. Piling energy levels for monopile foundations are in the order of 3,000-3,500 kJ. The energy used in Dublin Port and likely to be replicated in Foynes is in the order of one tenth of this energy level.

Bubble curtains require massive quantities of compressed air to operate even in non-tidal offshore settings. In a confined tidal area such as Foynes, the quantity of compressed air would require assessment for the potential impact on fish due to air bubbles being transported downstream and the level of sediment disturbed by their operation. The operation of an air curtain would also require the operation of multiple diesel fuelled compressors in the port. These potential environmental effects would arise for no additional mitigation effectiveness.

The use of a bubble curtain is as big a logistical operation as the piling operation and would lead to the lengthening of the piling programme.

The use of bubble curtains is not recommended because:

i. The piling noise levels are significantly lower than those where bubble curtains are used;
ii. The port is a confined area and underwater noise levels are only elevated close to the source;
iii. The species of concern do not habitually enter the port area;
iv. Piling will not be carried out after 18:00 hrs, which would be of more concern;
v. The strong tidal streams would make bubble curtains less effective;
vi. The effects of air bubbles and sediment disturbance offset any benefit from bubble curtains;
vii. The introduction of multiple diesel fuelled compressors is undesirable; and
viii. Extensive mitigation in accordance with appropriate guidelines is set out in the EIAR and NIS.

c. Use of vibrating hammer (as proposed) to be made for pile driving in order to reduce noise generation and propagation.

As outlined in the EIAR and NIS vibratory pile driving will be used to the maximum extent possible.

d. Extended time period to drive individual piles (as envisaged here – reference to 4 x days per pile in text).

The EIAR references 3 days per pile. In terms of the piling operations, it is difficult to put a definitive duration on the piling operations as one method will be to construct sequentially progressing from the East Jetty. That is, piling will progress only when the deck has been constructed as it will be used as the piling platform for subsequent works. Alternatively a jack-up barge which needs to be relocated for each pile will need to be utilised. Therefore the piling works will be an intermittent/staged process.

There is also variance in the geological profile of the sub-soils which prevents more exact estimates of piling durations.

Durations of 3-4 days are estimates, the longer duration will inevitably have more interruptions in the piling operation. This duration includes the vibratory piling, so the impact piling duration could be measured in hours.

e. Piling for limited time period each day and during daylight hours only – a large degree of migratory movement of fish occur in the hours of darkness.

This is included in the mitigation proposed in the EIAR and the NIS.