Item 50: Intervention Pit

Hydrological Impacts and Scour

Two further hydrodynamic simulations have been run for locations relating to the areas of greatest oceanographic impact. These are the permanent channels in the lower estuary and within the central crossing (Figure 1). The summary impacts are shown in figures 2 and 3. These results showed that the hydrodynamic regime will be enhanced by no more than 0.25m/sec. These impacts are notably less than the 0.4m/sec elevation previously assessed in the EIS (section 14.7.5). Consequently the severity of scour in these areas is going to be notably less. Mitigation for scour will be based on scour protection measures if located within the channel. This is expected to be concrete mattressing to protect the piling from significant erosion followed by sediment channel reinstatement. The base of the channel is known to be highly mobile sands (as evidenced by mega-rippling) with a poor macro-invertebrate community. This is expected to recover fully within a relatively short period of time post construction.

This process of natural scour infill was demonstrated within Ian Wilson's Brief of Evidence from the 2009 submission. This commented on a field assessment of the natural recovery of surface sediments on small areas of current scour created around the legs of a jack-up rig following geotechnical operations in the Bay in 2008. Examples of drilling rig recovery are shown in both the upper and lower sections of the bay (Figures 4 and 5, respectively).

Suspended Solids

Increased suspended sediments/turbidity from an intervention pit is expected to be very localised due to the particle sizes encountered at these locations (e.g. 600microns for the lower channel). Scoured material is expected to travel only a few tens of metres and limited to the boundary layer close to the seabed. Waters within the intervention pit will be enclosed by the sheet piling to prevent any significant escape of suspended solids during the excavation process. Mean natural surface waters have previously been recorded as 50mg/l. Salmon are expected to show an avoidance reaction to a localised area of up to 300mg/l if encountered.

Vibration and Noise

Vibration and noise from an intervention pit will vary with proximity to channel and underlying geology. However, a generic assessment based on a high powered vibro-piler (oscillation force 1250kN) for banks or an adapted jetted vibro-piler for the channel was assessed. This assessment was based on profile section 2 as outlined in Appendix H3 of Volume 2 of the EIS (Book 2 of 6). This location is approximately midway between the two locations hydro dynamically simulated above. The assessment was performed at high tide. The impact to air-borne noise is discussed in Appendix 1 of the addendum, section 5. Examples of the surface contours produced by this source are given in figure 6 and 7 for the two proposed "worst case" locations. The peak particle velocities and the underwater noise pressure waves at a frequency of 38 Hz are shown in figures 8 and 9 respectively). This shows that the vibration impact to the SPA on the bank would be around 0.1ppv/sec within 250m which will be imperceptible to birds. The use of the jetted system would reduce the noise output from the piling into the water column of the SAC to 200db at source, falling to 170db within 50m. This would have a strong, falling to mild, avoidance reaction by salmonids and pinnepeds.

Assessment of Impact on Avian Species

In the unlikely event of an intervention pit being required it is important to state clearly at the outset that said intervention pit can only be located between c. 350 metres east of SC2 compound at Glengad and 800 metres west of the SC3 compound at Aghoos, owing to the presence of bedrock in these areas (chainage 84.250 to 87.950). This confines the potential location of an intervention pit to areas well away from the areas of greatest importance to feeding and roosting waterbirds (Figures 3.4 & 3.7 of Appendix J1).

There will be no possibility of an intervention pit on the approaches to Glengad, where a significant high-water roost of waterbirds occurs, owing to the fact that the TBM is travelling through bedrock.

The working duration of an intervention pit, as described in the EIS addendum would be eight weeks (Appendix 1, Addendum). The unlikely requirement for the intervention pit could occur at any time during the tunnelling process and we have taken a conservative approach to the assessment of impact – assuming a worst case scenario in terms of the location of the pit and the time of year.

With regard to determining the effect of an intervention pit on overwintering bird populations in particular, it is crucial to consider their reaction to disturbance. While birds react to a variety of stimuli and cues in their environment it is well documented that species can also quickly habituate to ongoing activities that may initially cause disturbance.

Wherever an intervention pit might be located along the length of tunnel in the superficial materials it is acknowledged that there will be some localised disturbance which would be manifested as avoidance of the works area. This is similar to the observed reaction of birds to the presence and operation of the two jack-up barges which are currently in Sruwaddacon Bay carrying out borehole investigation surveys. Observations during these site investigation works have shown that waterbirds, especially gulls, frequently are recorded within 100 metres of the jack-up barges.

It is likely that the sheet-piling phase would generate the highest noise levels during the works associated with the intervention pit. The duration of this phase would be of approximately one week. However, as stated above the remaining section of the proposed pipeline route through superficial sediments lies outside the main concentration areas for all of the waders and waterfowl species regularly recorded in the study area and away from the principal high water roost .

On the basis of the foregoing and our extensive knowledge of avian behaviour, distribution and abundance, our conclusion is that, in the unlikely event that an intervention pit will be required, the potential disturbance zone will be highly localised (spatially and temporally).

Summary

A review of these “worst case” scenarios for an intervention pit within the main channel of the bay (for the SAC), or anywhere within the tunnel sand area for the SPA, demonstrates that the noise and vibration outputs from a proposed vibro piler will cause insignificant levels of disturbance to the birds, or the sensitive marine receptors within the bay. Consequently, no significant impacts are anticipated for either the SAC or the SPA.

Figure 1 Location of Intervention Pit Simulations

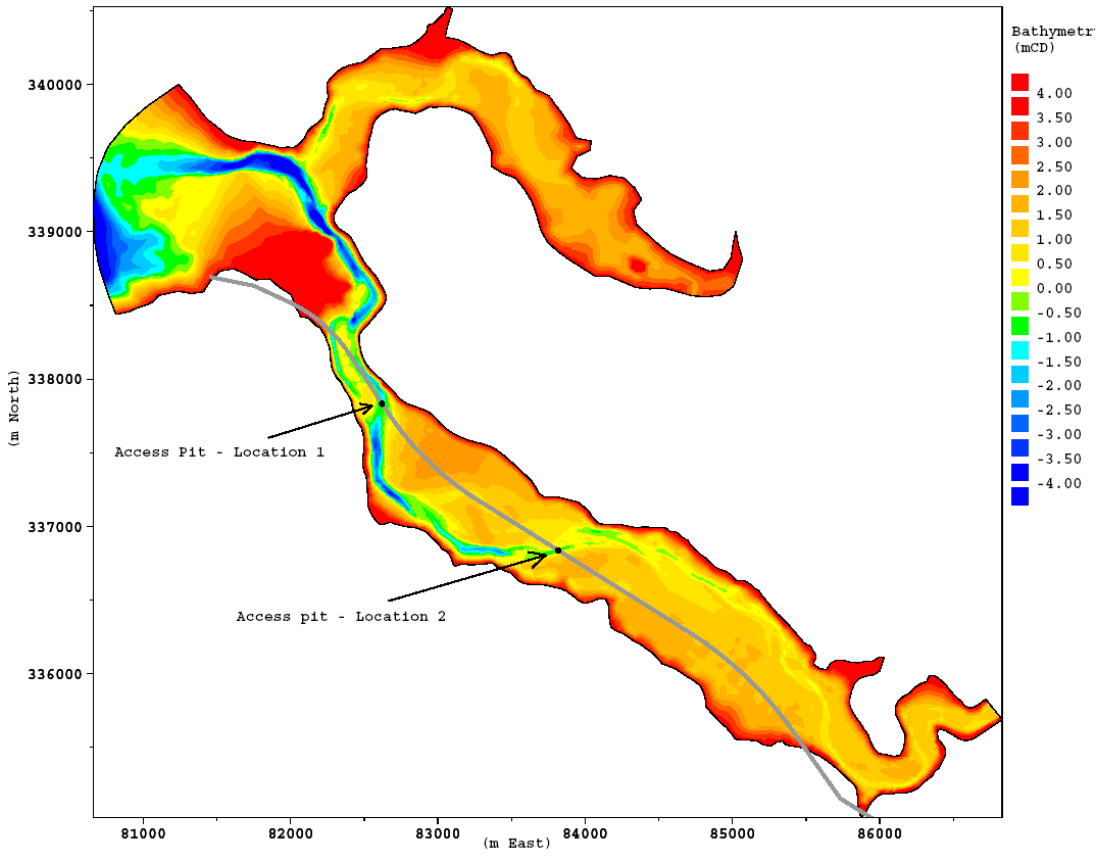


Figure 2 Flood and Ebb Impacts of Intervention Pit Location 1

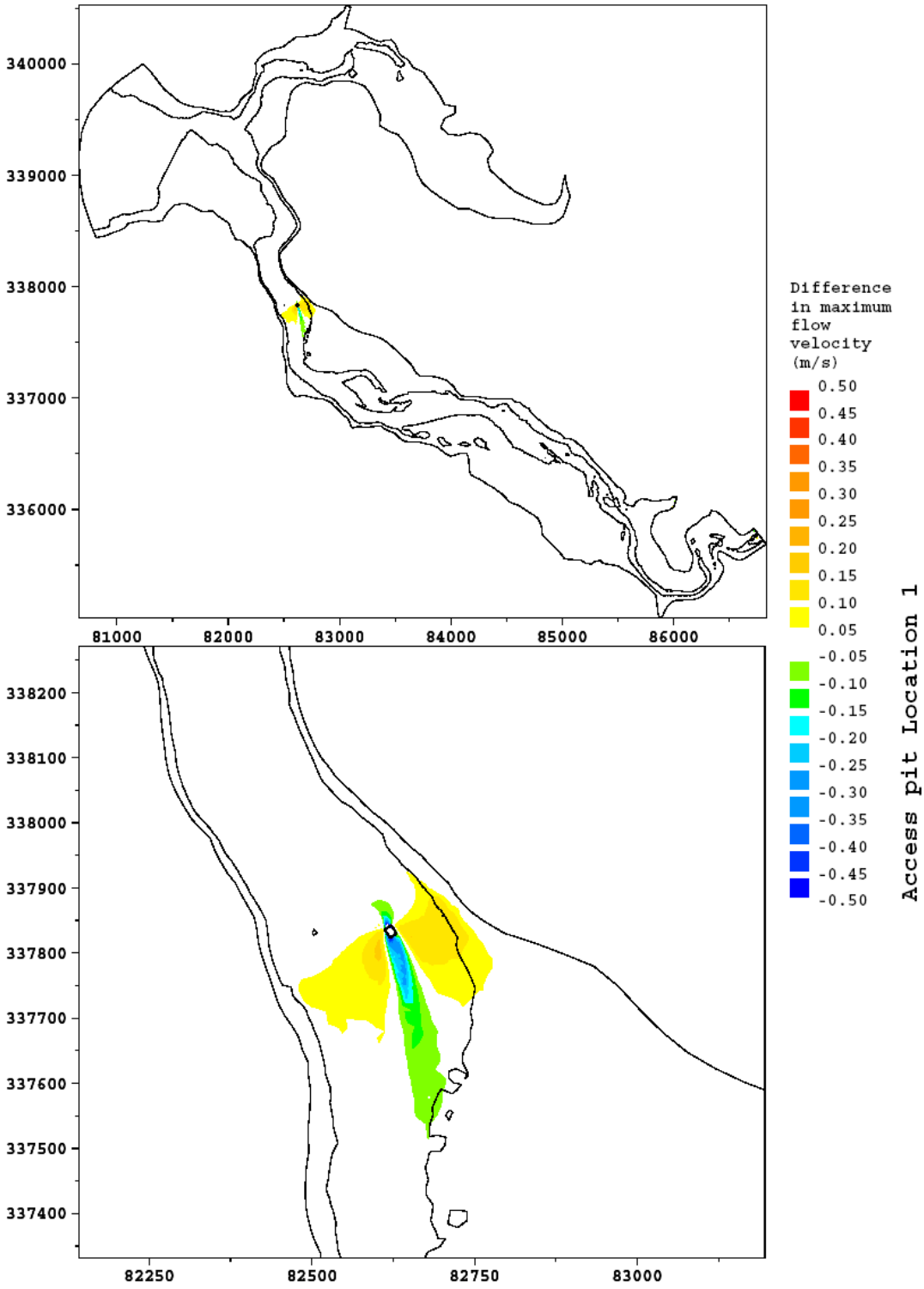


Figure 3 Flood and Ebb Impacts of Intervention Pit Location 2

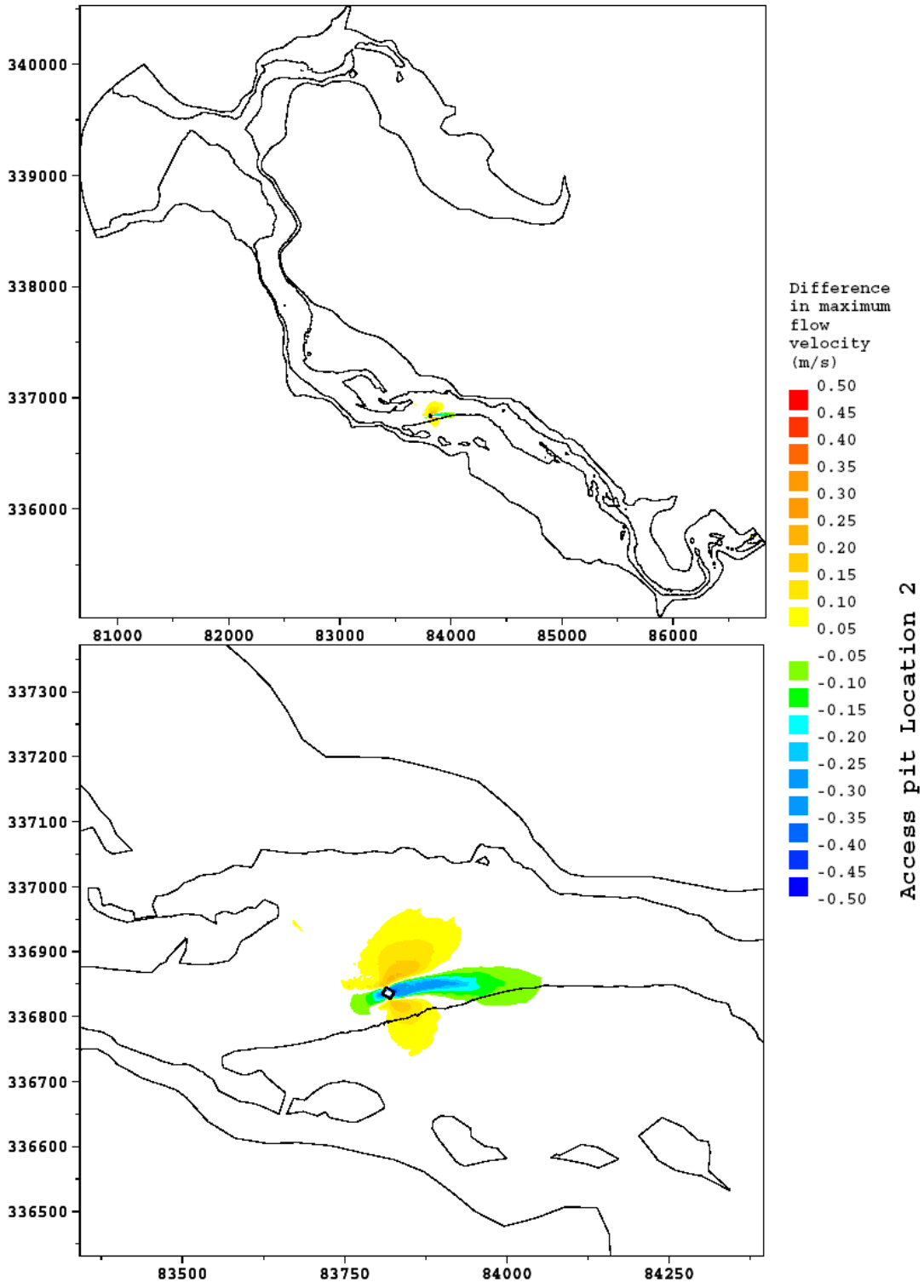
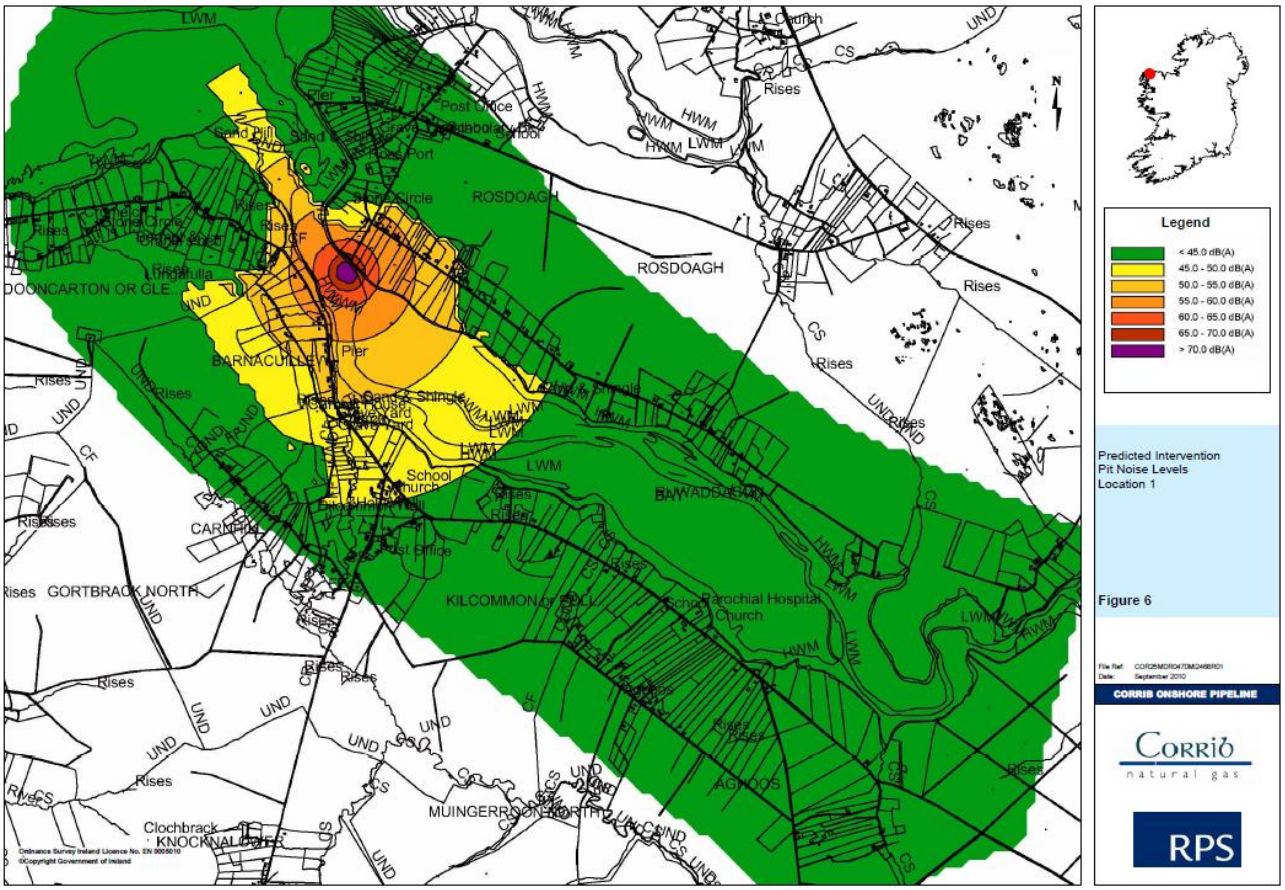


Figure 4 Scour Recovery at Jackup Location East of Glengad (Lower Estuary 2008)

Figure 5 Scour Recovery at Jackup Location Aghoos (Upper Estuary 2008)

Figures 6 and 7 – *Separately Attached*


Legend
< 45.0 dB(A)
45.0 - 50.0 dB(A)
50.0 - 55.0 dB(A)
55.0 - 60.0 dB(A)
60.0 - 65.0 dB(A)
65.0 - 70.0 dB(A)
> 70.0 dB(A)
Predicted Intervention
Pit Noise Levels
Location 1
Figure 6
CORRIB ONSHORE PIPELINE
Corrib
natural gas
RPS
ROSDOAGH
BARNACUILLEW
CARRIN
KILCOMMON or BALLY
GORTBRACK NORTH
MUINGERROON NORTH
Clochbrack
KNOCKNALOUGH
Parochial Hospital
Church
School
Post Office
Pier
Rises
LWM
HWM
UND
CS
CF

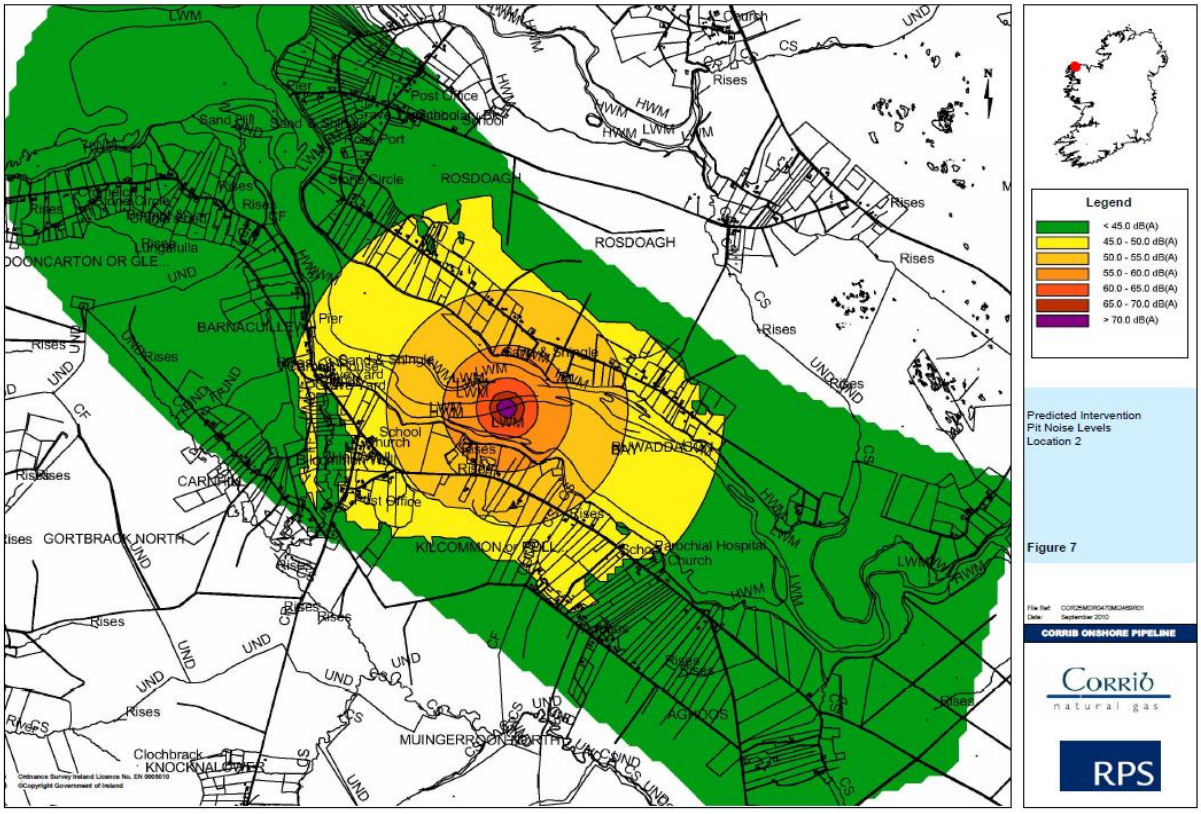

Legend
< 45.0 dB(A)
45.0 - 50.0 dB(A)
50.0 - 55.0 dB(A)
55.0 - 60.0 dB(A)
60.0 - 65.0 dB(A)
65.0 - 70.0 dB(A)
> 70.0 dB(A)
Predicted Intervention
Pit Noise Levels
Location 2
Figure 7
CORRIB ONSHORE PIPELINE
ROSDOAGH
BARNACULLEVY
CARNMORE
GORTBRACK NORTH
KILCOMMON or KILL
MUINGERRON NORTH
AGHOOS
Clochbrack
KNOCKNALOWER
Corrib
natural gas
RPS

Figure 8 Vibration from Vibro-Piling at Intervention Pit

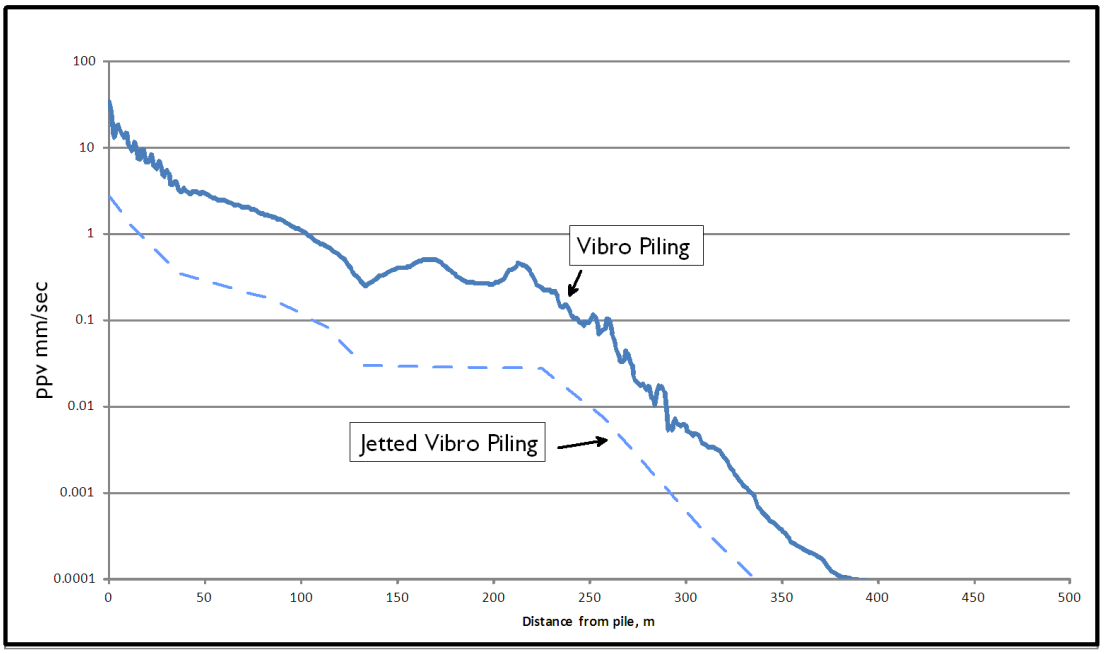


Figure 9 Water-borne Noise at Intervention Pit