# 17 Indirect and cumulative impacts and interaction between them

## 17.1 Introduction

This chapter addresses the cumulative impacts, indirect impacts and main interactions between different aspects of the environment likely to be significantly affected by the AMETS Project. In this respect only relevant topics which can be linked to the development are discussed and where not mentioned no potential for impact has been identified.

## 17.2 Approach and methodology

This chapter has been prepared with specific reference to the Guidelines on the information to be contained in Environmental Impact Statements (EPA, 2002), and Advice Notes on Current Practice in the preparation of Environmental Impact Statements, (EPA, 2003) (EPA guidelines) . Reference is also made to the Guidelines for the Assessment of Indirect and Cumulative Impacts as well as Impact Interactions (Office for Official Publications of the European Communities, 1999) (EU guidelines) and to Guidance: Cumulative Effects of Windfarms (Scottish National Heritage, 2005.

## 17.3 Indirect impacts

Indirect impacts are described in the EPA Guidelines as being 'impacts which are caused by the interaction of effects, or by associated or off-site developments'. For AMETS, indirect impacts are those not directly caused by the project but are associated with the development or arise from mitigation measures.

The main indirect impacts associated with the AMETS are the following:

- Impacts of quarrying materials for rock armour and construction. An estimated 32,000 $m^3$ of rock armour will be required for cable protection. The requirement to use inert material of similar nature to that existing on the seabed means that the material may need to be quarried at specific locations. There may be traffic and transport issues associated with the delivery of this material to a suitable harbour for transhipment to the AMETS site.
- There will also be a requirement for materials for the substation construction but the quantities will be small and available from local quarries.
- The extraction and transport of materials required to construct the AMETS may also give rise to increased employment not directly associated with the AMETS construction.
- The use of the wave energy test site by developers will lead to temporary economic benefits related to accommodation requirements, transportation and provision of services all of which will give rise to additional income to the area and temporary increased employment.
- The placement of rock armour as cable protection could result in an increase in abundance of species from the increased habitat area. This could result in increased catches and increased economic benefit to the fishing industry in the area.

- Bathymetry data collected as part of the seabed characterisation is available to the fishing community and potentially could be used to enhance overall fishing management.
- Online data on the wave and climate characteristics is being provided through wave and climate scientific equipment located at the test areas. This online data will provide useful information to fishermen, surfers and other recreational users of the marine environment in the area, providing knowledge of suitable conditions for their specific activities.
- The high bandwidth communication requirements of the test site will result in a communications infrastructure being put in place that will enhance broadband availability in the area generally.

## 17.4 Interaction of impacts

All environmental factors are interrelated to some extent. Consideration of the interaction of significant effects is also required. Where an interaction is considered to be likely it is discussed below.

Mitigation measures in relation to primary impacts are outlined in the relevant chapters of this document. These are not repeated and only mitigation that is additional to the primary impacts is described.

Within the project there are a number of potential interactions of impacts. These relate to ecology, traffic and transport, the fishing industry and navigation – each of these is dealt with below.

### 17.4.1 Ecology

The placing of rock armour over the cable will create approximately 3.2 hectares of artificial reef in linear lengths of 4 km. This could give rise to the following long-term effects:

- The creation of a different habitat to that already existing in the area, (depending on material used), leading to colonisation by species not normally found in the area; and long-term change in the composition of the biota along the reef and in the adjacent areas.
- Increase in biota of specific species as a result of the introduction of more favourable habitat for those species – this could lead to increased predation of other species with a knock-on effect on fish or bird species. It could also lead to increased fish catch of particular species and increased fishing activity in general.
- Changes in the biota of existing reefs due to fragmentation of habitat caused by the creation of the artificial reefs.
- The artificial reef could provide suitable habitat for non-native species (alien species) introduced to the area unintentionally from ships' bilges.
- Potential unforeseen changes and responses to the ecosystem may take place from the placement of multiple WECs.

***Additional mitigation***

The following additional mitigation measures should be considered:

- The value of minimising the potential impact of the cable by the use of inert rock armour material of similar composition to that found in the area has already been identified in Chapter 6. No additional mitigation has been identified for this impact.

However, long-term monitoring using high resolution drop-down video recording equipment or remotely operated vehicles should be undertaken at intervals of up to five years at selected locations to record changes in biota along the artificial reef structures.

- Vessels should be prohibited from emptying their bilge water at the AMETS location.
- When multiple WECs are deployed in small arrays at the site, monitoring activities should be increased to identify any potential cumulative impacts from the multiple deployments. This would allow for assessment of impacts on an incremental scale.

### 17.4.2 Traffic and transport

Wave energy technology is a new emerging renewable resource and in this sense is unique to the area. The presence of test areas off Annagh Head with innovative wave energy technology may prove to be a novel visitor attraction and lead to an increase in marine tourism in the Belmullet area. This impact could be for the project duration but would be intermittent depending on when and for how long wave energy devices are deployed at sea.

Annagh Head also offers a vantage point to view the test areas of the test site. However, the WECs at Test Area A will barely be visible (see the photomontages in Chapter 14) without high-powered binoculars.

The cable-laying may also attract additional sightseers to the area as the it would be a once-off and unusual event; any impacts arising from this kind of tourism would be of short duration.

- The increased tourism may lead to an increase in traffic on the local roads and parking in inappropriate areas. This could lead to traffic congestion if it occurred at the same time as the substation or cable interface joint bay construction. This would reduce temporarily the amenity value of the area for local users.
- Increased traffic noise could give rise to disturbance of wildlife, particularly birds in the Belderra and Annagh Head areas. This impact would be temporary in nature also.

***Mitigation***

The following mitigation measures are recommended:

- Project design during the construction phase should ensure that timing of activities mitigates against potential traffic impacts.
- A traffic management plan should be prepared for the cable deployment operations to manage any impact of increased traffic in the area during this phase.

### 17.4.3 Fishing industry

The establishment of the test areas at the 100m and 50m water depths may result in the creation habitats that are beneficial for certain fish and shellfish. This could lead to an increased fish stock resource in the area leading to enhanced or better quality catches in the future.

There is no direct evidence that this will occur and monitoring of catches and controlled studies would be required to establish this impact.

***Mitigation***

No mitigation is required in relation to the impact on fishing.. A monitoring programme should be developed to monitor any trend changes in populations of key economic species in the area – particularly brown crab and lobster.. The programme should be developed by the AMETS in conjunction with the local fishing community and suitable state agencies such as the Marine Institute and Bord Iascaigh Mhara (BIM).

### 17.4.4 Navigation

AMETS will give rise to increased marine traffic during the construction phase and also during the operation phase of the project. The Navigation Risk Assessment indicated that the increased marine traffic will not give rise to any significant impacts on navigation in the area; however, the increased traffic will contribute to the level of marine noise from shipping and fishing activity in the area. This has the potential to cause marine mammals and birds to avoid the AMETS test area. Such additional impacts will be low, will be intermittent in nature and will be confined to distinct periods.

Mitigation in relation to navigation has already been described in Chapter 6, and no additional mitigation is proposed.

## 17.5 Cumulative impacts

Cumulative impacts are those that result from incremental changes caused by other (past, present or reasonably foreseeable actions) together with changes directly arising from the project.

Cumulative impacts may arise resulting from a combination of other projects in the general area or from the project components itself.

SNH's *Guidance: Cumulative Effects of Windfarms* (Scottish Natural Heritage, 2005) indicates that an assessment of cumulative effects associated with a specific development proposal should be limited to the effects of that proposal in combination with the following:

- Existing developments, either built or under construction.
- Approved developments, awaiting implementation.
- Proposals awaiting determination within the planning process, and for which design information is in the public domain. Proposals and design information may be deemed to be in the public domain once an application has been lodged, and the decision-making authority has formally registered an application..

The principles of the SNH *Guidance* have been applied to the AMETS cumulative impact assessment approach. The Corrib Gas Field project has been identified as an existing project within the public domain impact should be considered cumulatively with that of AMETS..

### 17.5.1 Corrib Gas Field project

There is a large natural gas field currently under development 83km off the Mayo coast line. The offshore pipeline will run from the Corrib Gas Field to a landing point near Ballinaboy, Co. Mayo via Broadhaven Bay. The Corrib Gas Field is approximately 70km from most western test area of AMETS.

Figure 17-1 shows the pipe route submitted for the Corrib gas project (in its 2001 EIS) with the approximate location of AMETS superimposed. Once construction is complete, the pipeline will be fully buried. While the gas field is a considerable distance away, the proposed pipeline linking the gas field to the coast will be approximately 2.9 nautical miles to the north of Test Area A.

The onshore facility is almost complete, the offshore pipeline is installed and there are five wells in the Corrib field ready for production. The umbilical will be laid in 2012 alongside the offshore pipeline and the onshore section of the pipeline. The onshore pipeline is currently under construction. The tunnel under Sruwaddacon Bay will be commenced in 2012 and is expected

to take two years to build. Following that there will be a period of testing, after which the entire system the gas will be ready to flow.

The construction of the Corrib Gas Field offshore pipeline commenced in 2004 and is ongoing. There is therefore potential for cumulative impacts to arise from the simultaneous activities occurring for both projects. These will arise from the cumulative effects of increased vessel movements and construction traffic.

***Increased vessel movements***

The Navigation Risk Assessment carried out for the AMETS (Chapter 12 and **Appendix 9:** Navigation Risk Assessment ) dealt with marine traffic travelling between Broadhaven and Killybegs to the Corrib gas field. It accounted for vessels classified as 'other' and cargo travelling from E-W and W-E to the north of AMETS. These vessels were likely to be involved in the construction of a gas installation at the Corrib Gas Field. The vessel track density for the summer survey period confirmed this with above average activity occurring north of the site.

There is a potential for increased navigation risk from the cumulative effects of both projects going on at the same time. However, the Navigation Risk Assessment undertaken for AMETS has taken account of traffic associated with the Corrib Gas Field and concluded that the risk to navigation will be negligible and no additional mitigation is proposed.

***Increased traffic movements***

There is some potential for cumulative impact from construction traffic associated with the substation and the Corrib gas project. This could occur on the main R313 to Belmullet if construction was occurring at both sites at the same time. The resulting increase in road traffic could give rise to a higher collision rate on this road. However, the traffic and transport assessment (in Chapter 11) indicated that the AMETS project would contribute an increase of less than 1% to the annual average daily traffic (AADT) on this road. This increase will be temporary and the impact will be insignificant.

***Impact on human activity***

Simultaneous construction activities at both AMETS and the Corrib Gas Field project could result in higher cumulative demand on accommodation, food outlets, services and transport in the Belmullet area. This effect would be temporary and would have a brief positive impact on the economy and employment in the area. This would be dependent on the actual construction and operational period of AMETS and it is possible that the Corrib Gas Field construction would be finished before AMETS construction commenced.

***Impact on marine and terrestrial ecology***

No cumulative impacts are predicted on the marine or terrestrial ecology.

### 17.5.2 Other projects not yet in the public domain

There are a number of projects which have received attention in national and local media which may occur during the lifetime of the AMETS project but which are not yet in the planning process and for which there is no detailed design information. These include:

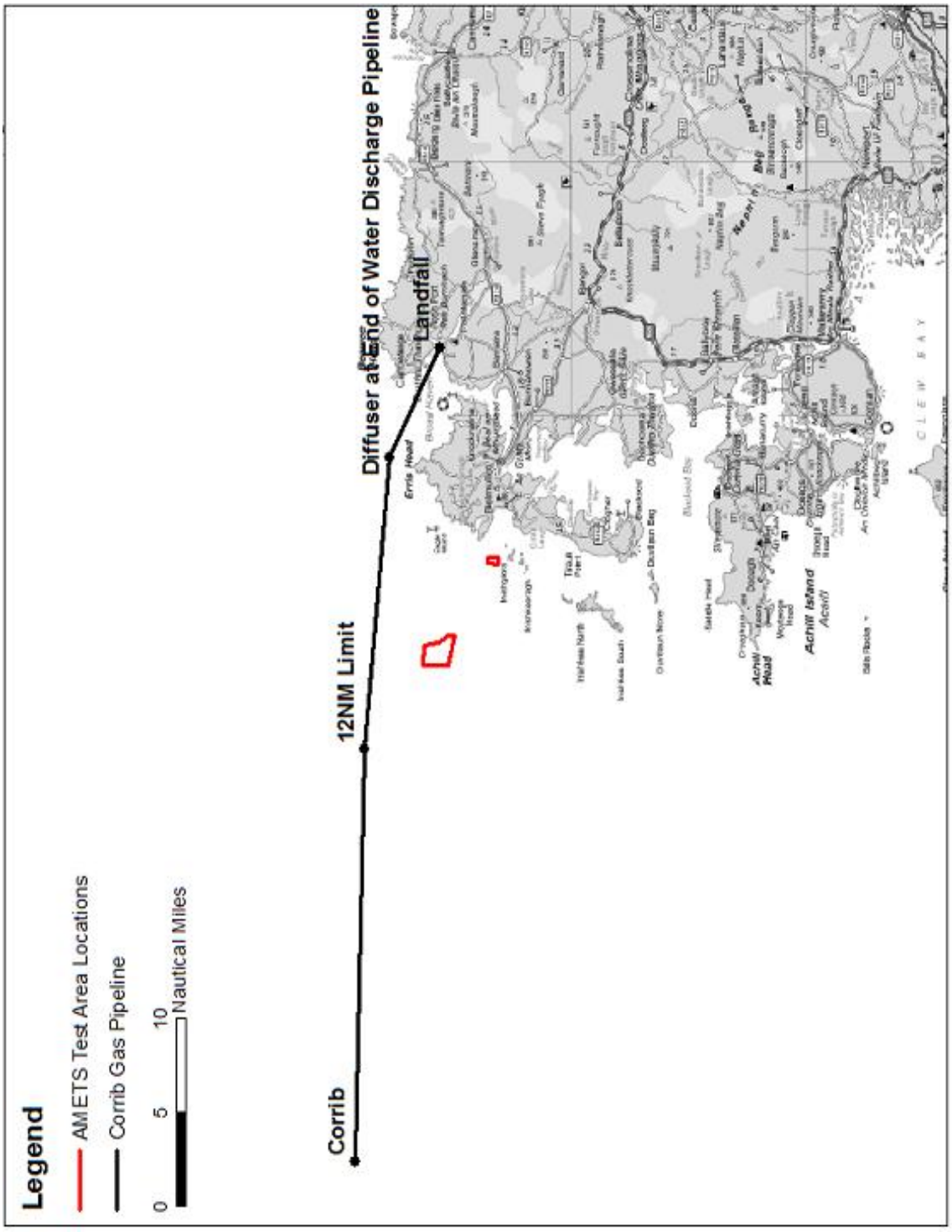
- **Westwave Project:** The European Union is providing funding for carbon reduction projects under the New Entrants Reserve 300 programme (NER 300). Westwave is a project proposed under this programme to develop a small pre-commercial wave energy farm (about 5MW ) on the west coast of Ireland,. The project is in development by ESB with Government funding support. A number of sites are being considered as a project location including a location at Achill Island (south of Dooeha), a site near Killard in County Clare and a site off the Belmullet area.

- **Glinsk seawater pumped hydro electric storage:** This project is proposed at Glinsk Mountain on the north Mayo coast. It would consist of a pumped seawater storage facility for electric power generation. This would be capable of accepting power of up to one third of the projected surplus night time wind power.
- **Emerald submarine telecommunications cable:** This project proposes to land a new trans-Atlantic high-speed fibre optic submarine telecommunications cable on the Mayo coast, possibly at Annagh Head. The fibre optic cable would subsequently be ducted to Belmullet and onward to the national fibre optic network, ultimately linking to the UK and Europe.

All of the above projects are in the development phase and will require either planning permission or a foreshore lease/licence from the statutory authorities if they are to proceed. No application for planning or foreshore lease/licence has as yet been made for any of these projects, and for that reason no assessment of potential cumulative impacts can be made at this time.

## 17.6 Conclusion

The assessment of cumulative impacts identified that navigation, traffic and human activity are the main areas where such impacts might potentially occur. The potential cumulative impacts that arise from the Corrib Gas Field project would be temporary, of short duration and insignificant in impact. A positive impact could arise for human activity in that there could be additional demand on local resources, accommodation and services, but this would depend on the implementation timing of AMETS.




*Source Navigation Risk assessment* ***(Appendix 9)***

**Figure 17-1: Corrib Gas Field pipe route**