

1.0 INTRODUCTION

Islandmagee Storage Limited is proposing to create an underground natural gas storage facility which will have its above-ground facilities near Ballylumford, in County Antrim, Northern Ireland. Seven caverns with a total gas storage capacity of approximately 500 million cubic metres are planned within a greater than 200 metre thick layer of salt located approximately 1,500 metres beneath Larne Lough. The facilities will permit the more efficient use of Ireland's gas infrastructure assets and will help to provide security of supply to Northern Ireland, which currently imports 100% of its natural gas requirements and generates 60% of its electricity using natural gas.

1.1 Islandmagee Storage

Islandmagee Storage Limited (IMSL), formerly known as Portland Gas NI Limited, is a Northern Ireland registered company which was established in 2007 to develop a natural gas storage facility in Northern Ireland. The company is a joint venture between Infrastrata plc (formerly known as Portland Gas plc) and Mutual Energy Limited (formerly known as Northern Ireland Energy Holdings Limited).

Infrastrata plc

Infrastrata's business is focused on the development of two gas storage projects in the United Kingdom at Portland, Dorset and at Islandmagee, County Antrim, Northern Ireland. The two projects could between them provide over 10% of the total UK and Ireland peak daily demand in the latter part of the next decade. The Company is also developing new projects in mainland Europe initially focussing on Germany and Spain. The Company is one of only a few in Europe focused specifically on gas storage development. In order that the "Portland Gas" name could remain with the Portland Project where it is very well established in Dorset, the name of the public company was changed in December 2009 from Portland Gas plc to Infrastrata plc. Infrastrata is a member of two leading trade organizations related to gas storage, the UK Gas Storage Operators Group (a group of the Society of British Gas Industries) and the Solution Mining Research Institute. Further information is available on the Company's website www.infrastrata.co.uk.

Mutual Energy Limited

Mutual Energy is a mutual company which manages energy assets in the long term interests of Northern Ireland's energy consumers. Having no shareholders, any financial surpluses are for the benefit of energy consumers. This combined with long term secure finance has allowed the company to manage major energy assets at a very low cost to consumers. Mutual Energy owns and operates the Moyle Interconnector (Moyle) which links the electricity systems of Northern Ireland and Scotland, and the Premier Transmission Pipeline System, which consists of the Scotland to Northern Ireland natural gas transmission pipeline (SNIP) and the Belfast Gas Transmission Pipeline (BGTP). These strategically important assets provide vital energy links with Great Britain, and Mutual Energy manages them to the highest standards of safety, reliability and efficiency. The company was re-named from Northern Ireland Energy Holdings in November 2009. Further information is available on the Company's website www.mutual-energy.com.

Tests undertaken at the Larne-2 borehole show that the Permian salt found at Larne appears to be low in impurities and is therefore particularly suited to natural gas storage.

In October/November 2007 a seismic survey was undertaken across the licence area identified in Figure 1.1 and part of Islandmagee to determine whether the salt layer was confined to the area around the Larne-2 borehole or whether it extended across the Lough, as was thought to be the case by Infrastrata's geologists. The survey was successful and identified a layer of salt up to 250m thick extending across the Lough, with the most promising area being located near Ballylumford, Islandmagee. The seismic survey is discussed in more detail in Chapter 12, "Geology and Hydrogeology".

Gas storage facilities require a connection to the national gas network and a considerable power supply for the compression equipment. The Scotland to Northern Ireland gas transmission Pipeline (SNIP) enters Northern Ireland at Islandmagee (Figure 1.2) and serves Ballylumford Power Station, the largest power station in Northern Ireland.

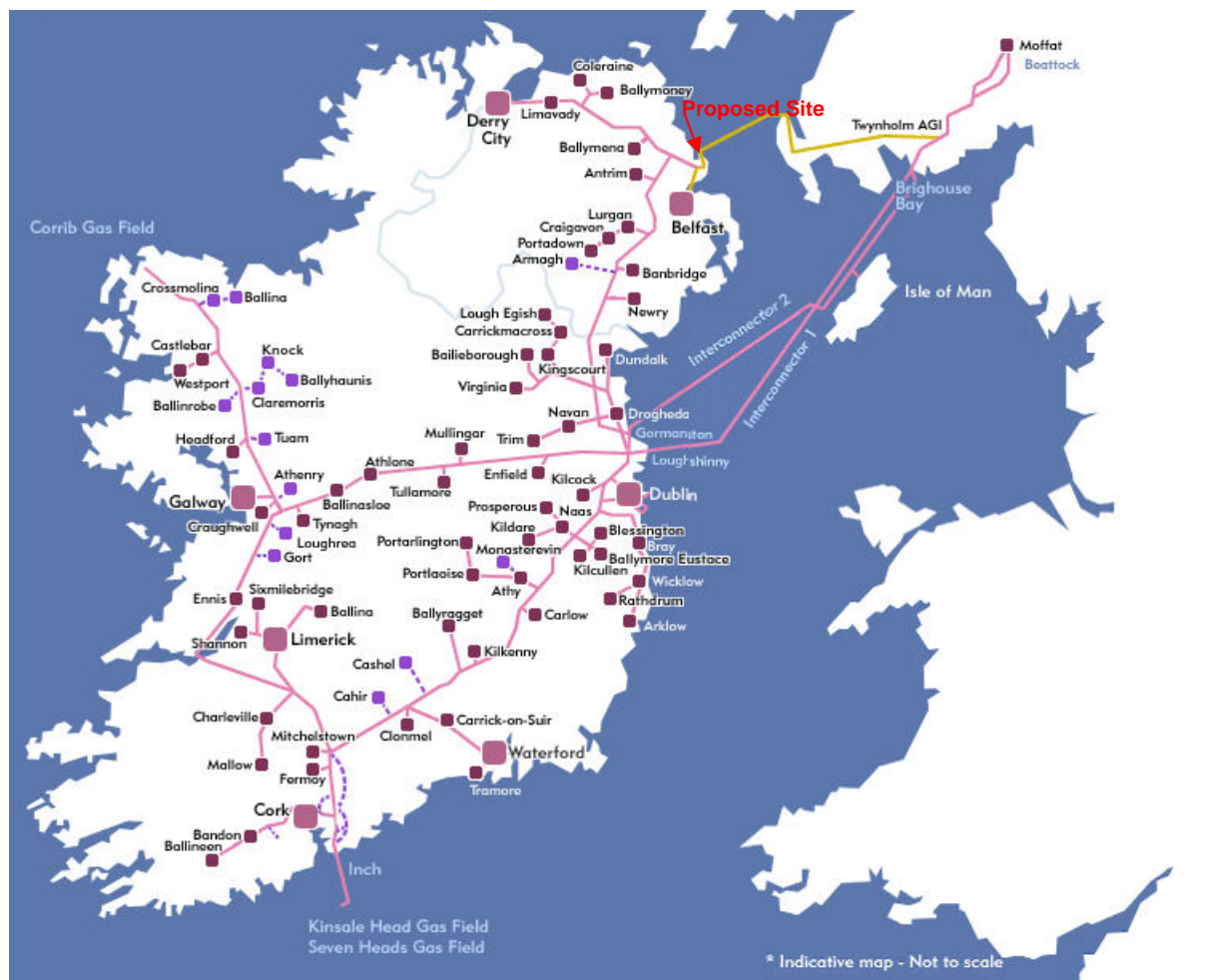


Figure 1.2 Main Gas Network in Ireland

Source: Bord Gáis Networks, 2009

In this respect a facility on Islandmagee would be ideally located in terms of infrastructure requirements. The Larne-2 borehole is currently the only site within the island of Ireland where Permian age salt has been discovered and exploration by both private companies and the Geological Survey of Northern Ireland is currently underway to investigate how far the

salt layer extends both inland and offshore and whether there is further potential for benefiting from this useful resource.

1.2.2 Outline of Proposed Development

Islandmagee Storage Limited proposes to construct 7 storage caverns at a depth of approximately 1,500 metres below the surface (Figure 1.3). The caverns will be directionally drilled underneath Larne Lough from a terrestrial site close to Ballylumford in Islandmagee and will be created by a process called “solution mining”.

The solution mining process involves directionally drilling a specially cased borehole, known in this context as a “well”, for each cavern, which will extend beneath the Lough to the salt layer. Sea water is pumped down the wells and circulated to dissolve the salt in a process known as “leaching”. The by-product of this technique, a brine (up to 30% salt), is then pumped back to the surface.

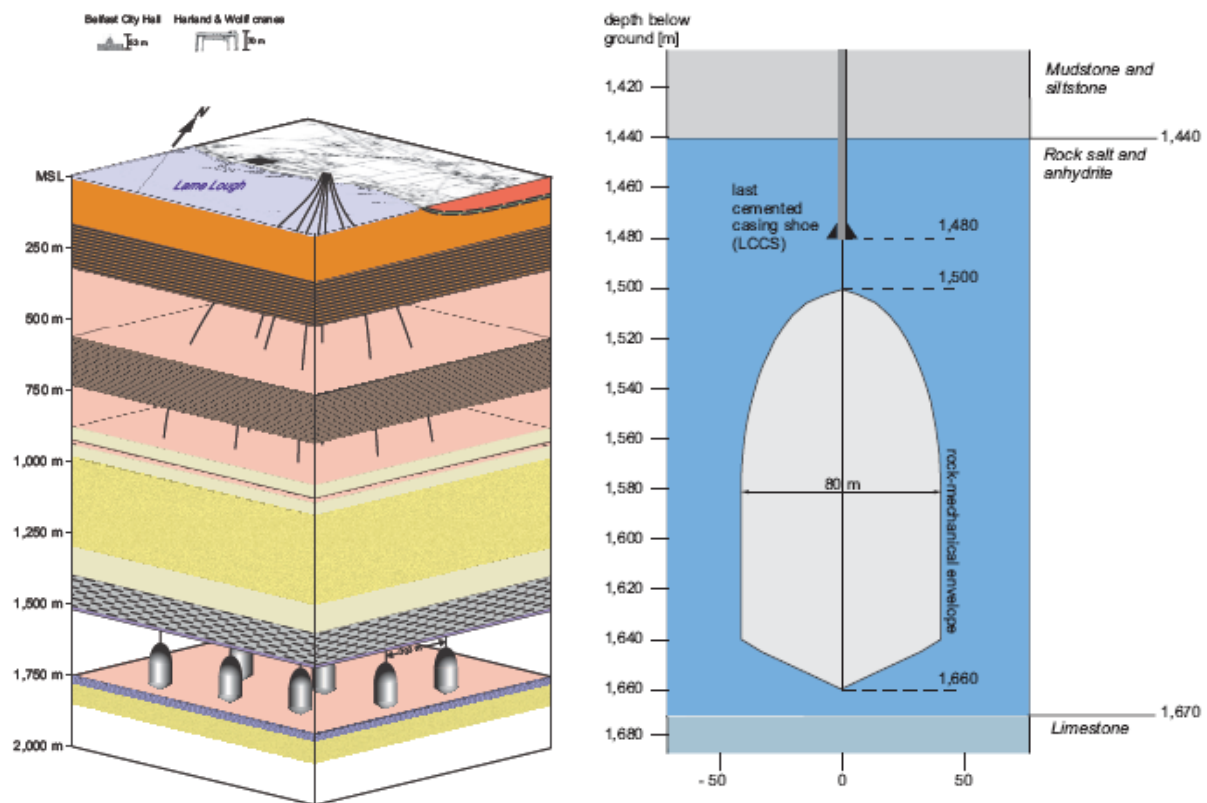


Figure 1.3 Conceptual Cavern Design Produced by DEEP Underground Engineering GmbH



The possibility of re-using the salt extracted from the caverns was investigated and will be discussed in more detail in the “*Consideration of Alternatives*” section of this Chapter. It was, however, determined that for this particular project the most appropriate means of dealing with the waste brine would be to pump it across Islandmagee and return it to the sea by managed dispersal through an outfall discharging point around 450 metres offshore of the eastern coast of Islandmagee in a water depth of approximately 27 metres (Chart Datum).

The solution mining, or leaching, process is carefully controlled to create the required cavern shape and a size best suited to the rock mechanical properties of the salt.

The main above ground elements of the proposed gas storage scheme (shown opposite in Figure 1.4) are briefly described below and will be discussed in more detail in Chapter 4 “*Project Description*”. Construction work on these facilities will be phased, with the wells and leaching infrastructure being built first, followed by construction of the main gas plant facility.

1. **Wellpad** – a flat pad approximately 110m by 45m which initially supports the drilling rig to create the wells and subsequently will contain the well heads in underground cellars.
2. **Sea Water and Brine Pumping Facilities (Leaching Plant)** – a building housing the pumping equipment and brine tanks which will pump sea water into the wells and pump the waste brine out of wells and back to the sea via an outfall during the construction phase.
3. **Main Gas Plant Facility** – the main operational facility which will house compression, heating/cooling, dehydration and metering equipment required for the day to day operation of the gas storage facility.
4. **Sea Water Intake Pumping Station** – an intake sump and pumping equipment located on the eastern shore of Islandmagee, at a site known as Castle Robin Bay or Bell’s Port, which will draw in the “fresh” sea water and pump it to the Leaching Plant.

These facilities will be connected by sub-surface **Sea Water Intake** and **Brine Outfall pipelines**. The wellpad and main gas plant facility will also be connected with a sub-surface **Gas Transfer Pipeline**.

An area of existing hardstanding close to the proposed site of the Leaching Plant and Main Gas Plant Facilities will be used as a temporary set down area throughout the construction phase. This will reduce the construction footprint at each of the proposed sites.

The Leaching Plant, Intake Pumping Station and Sea Water and Brine Pipelines are primarily intended for use during the initial construction of the storage caverns. However, the plant will not be decommissioned post construction as it may be necessary to undertake periodic maintenance during the lifetime of the project.

1.3 Project Justification

This section will discuss the need for gas storage within Northern Ireland as well as on a wider UK and Ireland level and why the Islandmagee Storage Project is particularly suited to meeting this need.

1.3.1 Types of Gas Storage

Gas can be stored at the surface in gas holders (low pressure tanks), as LNG in cryogenic tanks, within reservoirs (the pores spaces of rocks in depleted oil or gas fields), in subsurface structures which oil or gas has not been previously trapped (known as 'aquifer storage') or in caverns created within salt sequences. The main gas transmission pipeline infrastructure also contains a volume of gas that can be provided to balance the network by reducing the gas pressure in the lines (known as 'linepack').

Salt caverns can deliver proportionally more of their stored gas on a daily basis, particularly when compared with depleted field storage facilities. The gas can generally be cycled into and out of salt caverns more quickly than using the pore spaces within depleted fields.

All types of storage make an important contribution to ensuring that supplies to gas users are not interrupted.

1.3.1.1 Salt Cavern Gas Storage Facilities within the UK

Gas storage in salt caverns is a mature global industry, the first facilities becoming operational in the early 1960s. There are currently around 70 salt storage facilities in operation around the world, with many more under construction. About a third of these facilities are located in Europe, with the majority in Germany. Salt caverns are also used worldwide for the storage of other petroleum products such as oil, liquefied petroleum gas, hydrogen, nitrogen and ethylene (for example in salt caverns within Permian salt at Teesside in the UK).

Salt cavern natural gas storage facilities are currently in operation within the UK in both Cheshire and Yorkshire. The Hornsea facility in Yorkshire has been in operation since 1973. Three further facilities are currently being constructed at Holford (by E.ON) and Stublach (by Storengy) in Cheshire, and at Aldbrough in Yorkshire (by SSE in partnership with Statoil). Infrastrata plc, a shareholder of Islandmagee Storage Limited, is currently developing a new facility at Portland in Dorset.

Storage of natural gas within salt is restricted to areas where salt sequences are sufficiently thick to enable the creation of caverns. Within the UK & Ireland, suitable salt layers are of Triassic or older Permian age and are limited in their sub-surface distribution to North West England, Yorkshire, Dorset and the Larne area in Northern Ireland.

Salt caverns are able to be created if the salt can be leached and disposed of, or alternatively if a means of re-use found locally. In the case of Cheshire there has been longstanding brine production for industrial uses and brine generated by the leaching of salt caverns is able to be incorporated into these existing industries. Alternatively, elsewhere, such as for the Islandmagee Storage Project, a viable solution for disposal is to disperse the brine into the sea. Disposal into the sea was done for the development of the Hornsea facility, and is currently taking place in the development of a new facility at Aldbrough.

1.3.2 Gas Supply to Northern Ireland

Northern Ireland relies on its gas supplies via Great Britain through the Scotland to Northern Ireland natural gas transmission pipeline ("SNIP"). Annual supply of gas via the SNIP is approximately 1,500-1,700 million cubic metres ("mcm"), with an existing peak daily flow of up to 7 mcm per day (*pers. comm.* Premier Transmission Limited).

Gas is used to provide energy both in the form of gas for heating and industrial processes and as a source for electricity generation. Over 60% of Northern Ireland's electricity is produced by gas-fired power stations. All of Northern Ireland's gas supplies and the majority (over 90%) of Ireland's gas supplies are imported from Great Britain.

The UK became a net importer of gas in 2000 on an annual basis and by 2017 imported gas is expected to meet over 70% of UK demand due to the rapid decline in North Sea gas production (National Grid, 2008). This has implications for security of supply and the capability to meet peak gas demand.

Secure gas supplies are important for the UK as it is the world's fifth largest consumer of gas behind the US, Russia, Iran and Japan (CIA, 2009).

More than two thirds of the world's gas supply comes from just four countries: Russia, Iran, Algeria, and Qatar. In the future the UK and Ireland's gas supplies will increasingly originate from more distant locations such as by pipeline from Norway, Russia and Algeria, or by ship (as liquefied natural gas or "LNG") from the Mediterranean and the Middle East. New LNG terminals recently opened at Milford Haven in Wales and at Teesside. There is a current proposal to construct a LNG facility on the Shannon Estuary in Co. Kerry, Ireland.

1.3.3 The role of Gas Storage to meet UK and Ireland Gas Demand

There are 3 principal forms of flexible gas supply within the UK and Ireland:

- Gas via pipeline (UK Continental Shelf, Norway, Ireland offshore, Interconnectors to Europe)
- Gas shipped as LNG (Milford Haven, Isle of Grain, Teesside)
- Gas storage

The above are not mutually exclusive. Some of the gas which is sourced via pipeline from Europe is contracted from mainland European gas storage facilities. Gas storage and LNG imports can work together to provide flexibility to the market. Access to storage enables LNG importers to optimise their portfolios and mitigate risk. From a practical viewpoint, using fast-fill storage facilities improves the overall utilisation of capacity at re-gasification terminals, as it allows gas to flow more freely into the market, reducing the impact on spot prices, thus allowing import terminals to free up space more quickly than might otherwise have been possible. This also helps to improve security of supply. Having alternative supply arrangements from storage in place during periods of bad weather for example, helps improve the reliability of LNG supplies.

The above all provide security of supply, but storage becomes very important in the case of external supply disruption; potentially very important to Northern Ireland given its reliance on gas from UK markets via SNIP.

Gas storage is a very important tool to provide flexibility. Gas storage facilities can be filled during times of lower demand to be available during periods of higher demand, either on a daily basis or seasonally.

1.3.4 Integration with Renewable Energy Generation

There is a desire in the UK and Ireland for increased renewable power generation to meet reduced carbon targets. As part of its climate change package announced in 2008, the EU has set EU wide targets for 20% reduction in energy use, a 20% share for renewables in the energy mix and a 20% reduction in greenhouse gases, all by 2020. At present, Northern Ireland produces and consumes 7% of its electricity from renewable sources and the current Northern Ireland target is to achieve 12% renewable electricity by 2012. The Department of Energy, Trade and Investment is considering that Northern Ireland should set a new strategic goal to increase the amount of electricity generated from renewable sources to 40% by 2020 (DETI, 2009). This is likely to be primarily achieved through wind-powered generation.

A shift to renewable energy sources is likely to result in an increasing reliance on gas-fired power stations to support the fluctuations in supply from the intermittent nature of renewable power generation. Rapid cycle gas storage facilities, such as the Islandmagee Storage project, will be important to respond to the rapidly fluctuating gas supply demands for electricity generation, in effect also acting as “electricity storage” in a low carbon economy.

1.3.5 Current UK and Ireland Storage Capacity

Annual consumption in Great Britain and Northern Ireland is currently approximately 100 billion cubic metres. The current storage capacity is around 4.5 billion cubic metres or 4.5% of the annual consumption, compared with 25% in France and 21% in Germany. Considered another way, in the event of a supply disruption, the UK has only about 16 days of storage, compared to 91 days in France or 77 days in Germany.

The large economies in Europe have more storage than the UK because they have not had the benefit of a large production base, previously enjoyed by the UK from the North Sea, and their gas companies have become used to managing gas supplies using storage as a network balancing tool.

The UK requires significantly more storage volume. Several new facilities are currently being developed in the UK, both within deep lying salt layers and in depleted oil and gas fields to meet the anticipated demand.

1.3.5.1 Current UK and Ireland Storage Facilities

The offshore Rough reservoir storage facility, with approximately 3,000 mcm storage volume, offers space as 'Standard Bundled Units' or SBUs. Rough is divided into approximately 450 million SBUs of gas storage space. A customer has the right to inject or withdraw gas into Rough, storing as much gas as they have leased space. In the case of Rough it takes 167 days to completely fill and 76 days to withdraw the total volume of gas. A proportion of the space can be injected or withdrawn at any time during a storage year, subject to a utility charge in addition to the SBU charge.

The Hornsea salt storage facility also offers similar services to customers. Other facilities, such as Humbly Grove, a depleted oilfield gas storage facility in Hampshire, have third party access exemption and do not offer services to the general market. The size and value of a given SBU of space varies from one facility to another depending upon the time it takes to 'fill' or 'empty' the space, which is determined by the type of storage.

The only gas storage facility on the island of Ireland is in a depleted field located offshore south of Cork in the south west Kinsale gas field with a storage volume of 170 mcm, however there are plans for further gas storage development in this area.

Salt cavern storage generally has a shorter cycle time (the time needed to withdraw the gas in addition to the time needed to inject the gas). Storage space with a shorter cycle time will generally command a higher premium for a given storage volume. A more expensive storage space is offered by National Grid at their LNG storage facilities, with the advantage to the customers of the ability to unload the stored gas in just 5 days. Such a source of gas can be very important on the coldest days in the winter to meet high demand spikes. The added cost of such space is reflected by the high price of gas in the market on such cold days.

Reservoir or depleted field storage facilities generally have less ability to cycle the gas and are known as 'seasonal' facilities, taking much of the summer for gas to be injected and a good proportion of the winter for the gas to be withdrawn.

The proposed Islandmagee Storage facility, with its approximately 65 day cycle, would largely be filled up in the early summer and be emptied in mid-winter. However, through the

rest of the year, the ability of the facility to withdraw gas at a rate of up to 22 mcm per day, inject gas at up to 12 mcm per day and switch direction within two hours means that it would be regularly used to balance supplies to domestic and commercial businesses.

1.3.6 Future storage requirements in the UK and Ireland

Storage requirements are minimised if the supply can be varied to exactly meet the varying hourly demand. Following the switch over to North Sea supplies in the late 1960s/early 1970s and right up to the early part of this decade, sufficient gas was produced in the UK to meet demand levels in UK and Ireland.

By the end of the 20th century there was still sufficient capacity in the North Sea gas fields so that only 3-4% of annual demand was required in storage to meet the fluctuation in demand of domestic and commercial consumers. However North Sea reserves and production are in decline (Figure 1.5). The new Corrib field off the west coast of Ireland is anticipated to be already in decline by the time the Islandmagee Storage project is ready for gas operations.

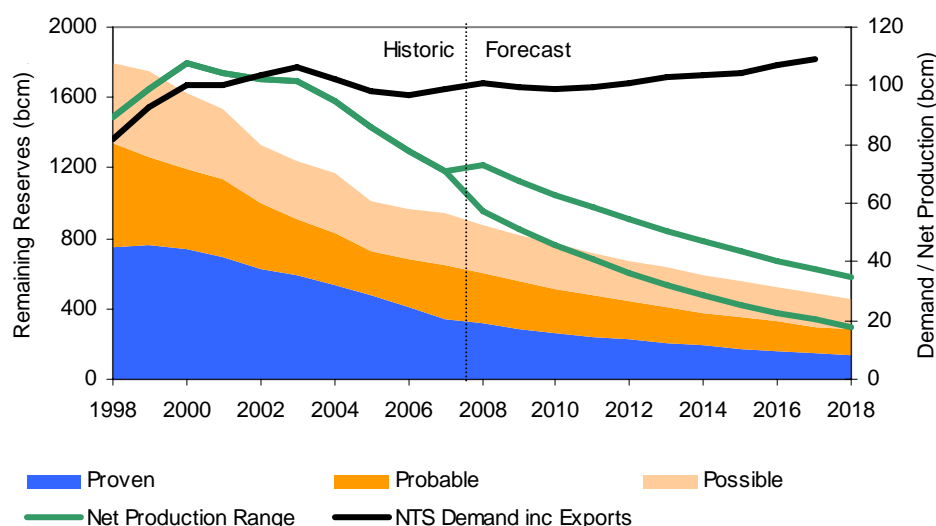


Figure 1.5 Remaining UKCS Reserves and Long Term Production Trends

Reproduced from National Grid 10 Year Statement 2008

The gas consumption in the winter is approximately double that within the warm summer months. In the past the UK could rely on flexibility from the producing fields in the North Sea to meet the variation in demand, supported by a relatively small volume of gas in store compared to the large economies of France, Italy and Germany with little domestic production (less than 15%), which have required a storage capacity of 20-25% of imports to satisfy the variation in gas demand.

Although the new import facilities will allow the imports of gas required to replace the UK's dwindling production there is no guarantee that the gas flows will be available or can be

managed in the market place to meet the great variability in gas demand or balance the network and supply Northern Ireland on a daily basis throughout the year. Cold weather will tend to affect Europe at the same time, putting pressure on supplies and some LNG ship imports could be diverted on a particular day to a market where the price might be higher (e.g. the US or Far East). New import sources therefore bring new challenges to the UK market and potentially a significant increase in wholesale gas price volatility.

Subterranean gas storage is a good cost effective solution to manage flexibility of gas supply in the market.

In the future there will be more flexibility in supply from gas via pipelines and LNG cargoes within a liberalizing gas market spreading increasingly across Europe and further afield. In order for the UK, Northern Ireland and Republic of Ireland market area to respond to the more flexible supply and to provide security, they will require an increased storage capacity ideally representing at least 15% of annual demand (approximately 15,000 mcm), significantly more than the current storage position.

There are currently no underground gas storage facilities in Northern Ireland. Islandmagee Storage Limited believe the proposed facility at Ballylumford will be an important asset locally, regionally and nationally to ensure the efficient functioning of the gas market and security of supplies.

The proposed facility at 500 million cubic metres represents approximately 0.5% of the UK annual demand of gas. If construction commences in the first quarter of 2011, the gas operations could commence in 2015 and full volume available in 2017. Within Northern Ireland it is anticipated that the Islandmagee Storage facility could store 20-30% of Northern Ireland's annual demand depending upon the level of gas demand when completed.

1.3.7 Potential Cost Benefit

A storage facility at Islandmagee has the potential to provide a number of cost savings for NI customers:

- It would result in a more efficient running of the network resulting in savings on operating costs
- It may help avoid the need for future investment in gas transportation infrastructure
- The project will make a contribution to providing a reliable source of flexibility of supply in the Great Britain, Northern Ireland and the Republic of Ireland market area, creating a stabilising influence on prices, reducing price volatility and thereby reducing wholesale gas prices at times of peak demand, which in turn will lead to more stability and should therefore assist in lowering Northern Ireland gas prices

- Security of supply – the facility will be insurance against a supply interruption from Great Britain. When filled, it can store more than 60 days supply at peak Northern Ireland winter demand.
- The tariff structure for gas storage in Northern Ireland is likely to result in it being cheaper for Northern Ireland shippers and suppliers to use a storage facility on Islandmagee compared to storage facilities in Great Britain, thus providing a cost benefit to the Northern Ireland end user.
- Presence of storage and its stabilising influence in Northern Ireland may provide a springboard for new market entrants leading to more competition.
- Revenues for providing storage services by Mutual Energy will be ploughed back to reduce Northern Ireland customers costs or investment in new energy infrastructure.
- Construction of the approximately £250m facility will itself be a catalyst for significant Northern Ireland inward investment with new equity and debt input.
- The facility will enable creation of new jobs and technology skills – no existing gas storage projects currently exist in Northern Ireland.

1.3.8 Gas storage and the National Interest

In the case of a supply disruption to the UK, either temporary, for example LNG tankers caught up in storms offshore unable to unload their cargoes, or longer-term interruption to supplies from Africa, the Middle East or Russia, gas in storage would provide a significant contribution to security of supply in the Great Britain, Northern Ireland and Republic of Ireland market area.

The cost to the economy and human health for the loss of heating or power could be very significant.

A minimum pressure must be maintained within the gas transmission networks for safety reasons. As the pressure drops, power stations and businesses will initially be interrupted before domestic customers. Ultimately domestic customers would be progressively disconnected. There are then safety issues with the slow reconnection of gas supplies as all premises would need to be inspected before supplies could be restored.

A gas storage facility at Islandmagee would be important to security of supply, safety and health in Northern Ireland.

1.3.9 Operation of the Islandmagee storage facility

Islandmagee Storage Limited, a company registered in Northern Ireland and with its project office currently based in Belfast, would own and operate the gas storage facility.

Islandmagee Storage Limited would become a significant independent energy company based in Northern Ireland with a headquarters staff of 20-30, likely located within southeast County Antrim, and with additional staff located on site. Capacity in the facility would be made available to the market .

1.4 Consideration of Alternatives

The need for the creation of gas storage facilities in Northern Ireland is demonstrated and justified in Section 1.3 above.

The consideration of alternatives is an important requirement of the Environmental Impact Assessment (EIA) process. For the purpose of the EIA regulations, alternatives may be described at three levels;

- Alternative Locations,
- Alternative Designs,
- Alternative Processes.

1.4.1 Alternative Locations

1.4.1.1 Location of Caverns

As explained in Section 1.2.1, the Larne-2 borehole drilled in 1981 is, to date, the only onshore borehole in the island of Ireland in which bedded salt of Permian age has been recorded. Salt of Triassic age is present at a much shallower depth throughout a wider area of south east Antrim and has been mined since the 1960s by Irish Salt Mining and Exploration, mainly for use in road de-icing.

Whilst gas storage is feasible in Triassic age salt in other parts of the UK, notably Cheshire and soon in Dorset, the Triassic salt in south east Antrim is considered to be at too shallow a depth and without the correct physical and mechanical properties to be suited to gas storage.

There are no depleted oil or gas fields in Northern Ireland. A small storage facility with a capacity of 170mcm exists in a depleted gas fields near Kinsale, Co Cork, but as explained in Section 1.3.1 above this type of storage is not as versatile as salt cavern storage and the storage capacity only represents a small fraction of that required to sustain Ireland's needs in the event of a supply shortage.

Throughout 2007, Islandmagee Storage Limited, assisted by geophysical and geological consultants Geo-International, embarked on a programme of examining the geology around the Larne Lough basin.

A second borehole, known as Newmills-1, was also drilled in the 1980s, approximately 10 miles south east of the Larne-2 well as part of the then Department of Energy's petroleum exploration programme. The two wells were connected by a 2-D seismic line, known as the "Antrim B Seismic Line". The Newmills-1 well did not discover any Permian age salt and the Antrim B Seismic Line shows the salt reflectors gradually thinning out towards the south.

As part of the desktop studies for the seismic programme, the logs for these boreholes were examined and the Antrim B seismic line was reprocessed. Regional gravity and high resolution aeromagnetic survey data was also examined and geology fieldwork was also

undertaken around the Lough with the assistance of the Geological Survey of Northern Ireland.

Following this, an area in the northern part of Larne Lough was identified by Islandmagee Storage Limited as having the most potential for a suitably thick salt layer for potential gas storage and was subjected to a 3D seismic survey in October-November 2007. This area is outlined in pink on Figure 1.6 below. The lack of basalt cover on the sea bed in Larne Lough enabled clear imaging of the reflectors below the surface and a 2D seismic line was tied in to the Larne-2 well to ensure correlation of seismic data with the borehole data.

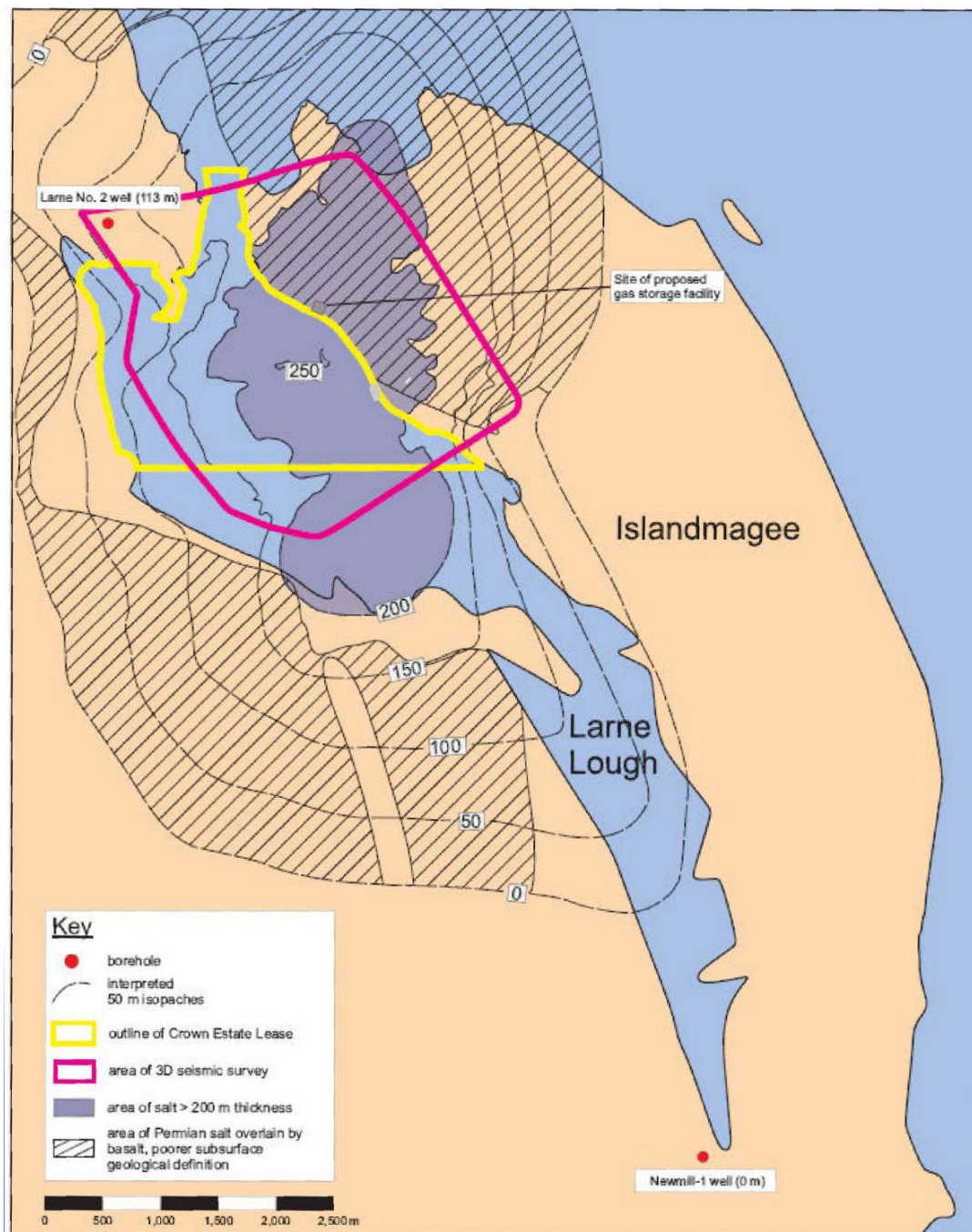


Figure 1.6 Contour Map showing Thickness of Permian Salt as imaged by 2007 Seismic Survey

The seismic survey not only demonstrated with a good degree of confidence that the salt layer logged in the Larne-2 well did extend beneath the Lough, but also showed that the thickest part of the salt was located towards the eastern side of Larne Lough, in the vicinity of Ballylumford.

The shaded areas on Figure 1.6 above show the areas where basalt overlies the sedimentary rocks beneath. In these areas, the seismic survey had poorer subsurface definition as the basalt degrades the image quality. The field studies and desktop assessment also indicated that there was a greater likelihood of faulting beneath the land areas and therefore the decision was made to locate the caverns beneath the sea bed of the Lough in the area where the seismic imaging was very clear and it could be seen that there are no geological faults or visible lenses of non-salt sediments which could compromise the integrity of the gas storage facilities.

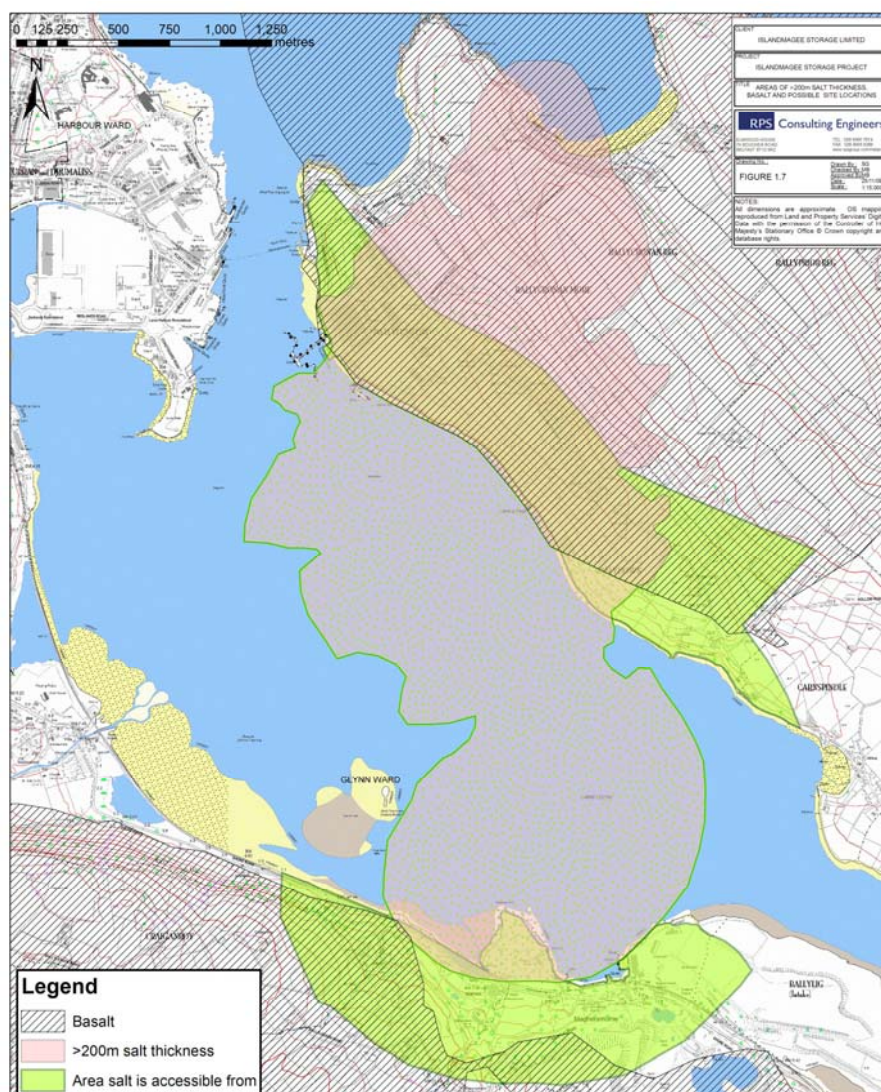


Figure 1.7 Areas of land from where thick salt beneath lough can be accessed

The directional drilling technique proposed for creating the caverns allows access to the salt beneath the lough from a horizontal distance of up to 1,000m. Two areas of coastline,

outlined in green in Figure 1.7 above, were identified as being potentially suitable for locating the wellpad and gas plant facilities.

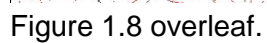
1.4.1.2 Location of Above Ground Facilities

Several factors were considered in choosing the potential site of the above-ground elements of the proposed gas storage facility

- Environmental Designations and Conservation
- Land Use
- Infrastructure
 - Proximity to connection to high pressure gas network
 - Proximity to accessible source of electrical power
- Physical resources
 - Proximity to thickest parts of salt layer
 - Proximity to water body for sea water intake and brine dispersal
 - Topography

Infrastructural constraints that were not feasible to overcome, such as high voltage overhead power lines and the safety zones surrounding the existing gas transmission pipelines were also taken in to consideration.

Five sites around the perimeter of Larne Lough were investigated as possible locations for the above ground facilities for the proposed gas storage scheme. These locations are shown on



A scoring matrix was developed and each site was scored on fulfilling the following criteria:

- Distance from electricity supply (110kv substation)
- Distance from transmission network gas supply
- Is there a requirement to lay pipelines/cables across Larne Lough
- Minimum possible distance to 25m water depth for brine pipeline
- Degree of Landscape impact
- Is the site a brownfield site
- Are there any recorded archaeological sites within the area
- Does the site overlie basalt (basalt makes drilling of wells more difficult and noisy)
- Distance from nearest residential property to site perimeter
- Is the site reasonably flat/will significant earthworks be required
- Is there any risk of contamination in the site

The full scoring matrix is presented in Appendix 1.1 but can be summarised as follows:

Site A	45/100
Site B	67/100
Site C	60/100
Site D	45/100
Site E	25/100

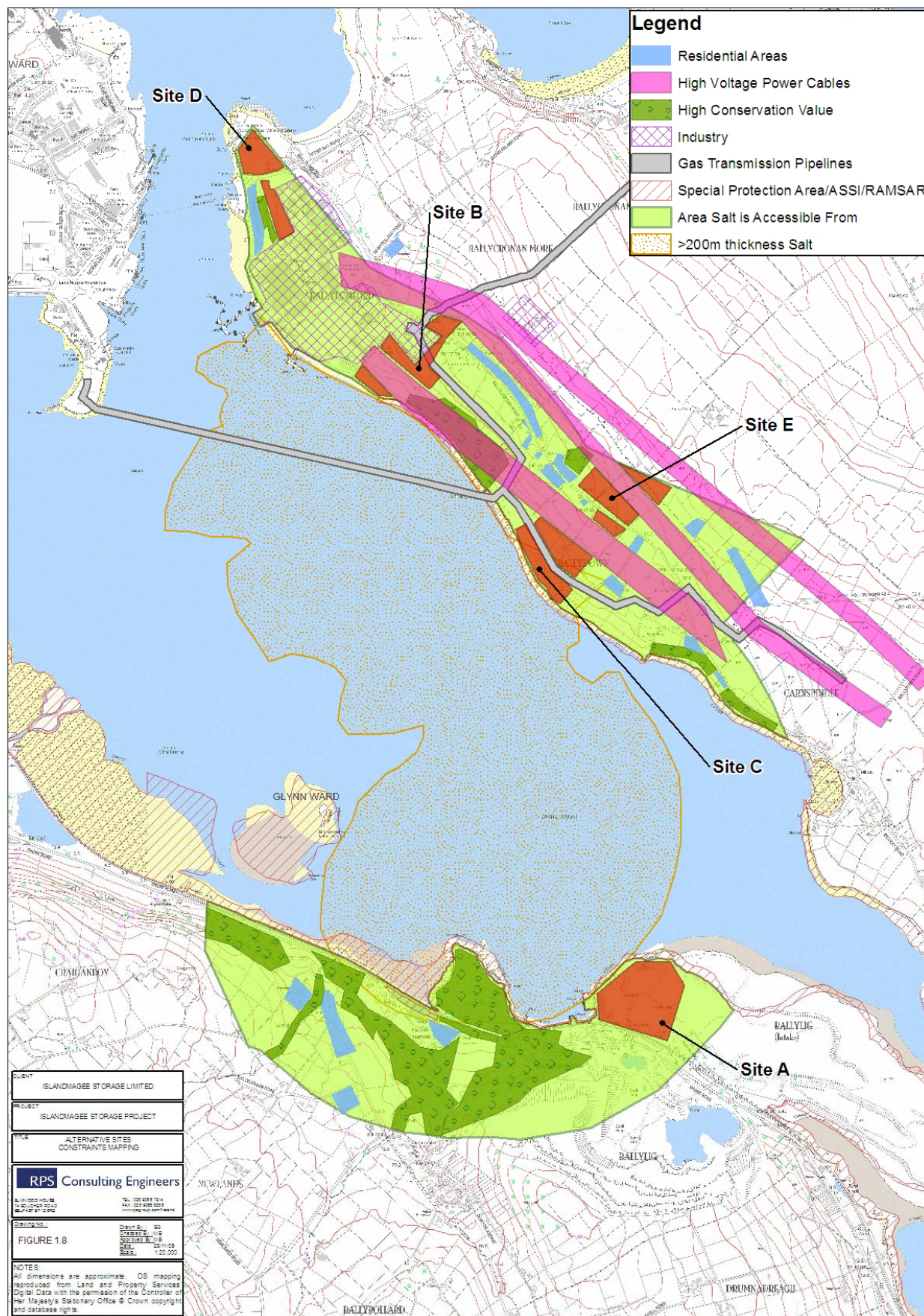


Figure 1.8 Constraints to Locating Above Ground Facilities

Following the scoping exercise, it was determined that sites D and E were not suitable for further consideration. The proximity of Site D to a residential area and difficulties in connecting to infrastructure points without creating significant environmental impact contributed to its low score. Site E was considered to be potentially visually intrusive, too close to residential dwellings and would also require quite extensive works to access the infrastructure connection points. Site E is also located on top of basalt and is at the very limit of being able to access the salt which would create significant amounts of additional noise during the drilling phase.

Site A, being on the site of a former limestone quarry and being located some distance away from any residential development is favourable in the context that it is a brownfield site in need of redevelopment. However, connecting any facilities at site A to the main gas and electricity network would require constructing a high pressure gas pipeline across the Lough, passing through the Larne Lough SPA, ASSI and RAMSAR designated area to access the network at Ballylumford. The transmission pipeline running to the Pressure Reduction Station at Curran Point is a smaller diameter pipeline and would not be capable of servicing the gas storage facility. High voltage electricity cables would also be necessary to cross the Lough to connect to the 110kv sub station at Ballylumford or alternatively a small power station would have to be built on-site. A brine pipeline would also be required to extend from the site to a suitable distance offshore, this would require a minimum of 7km of pipeline which would either have to track around the lough on land, or would require to be buried in a trench through the lough entrance. The distances involved would be too great for trenchless technology and burying a pipeline at the lough entrance would cause unacceptable interference to the Port of Larne. Site A was therefore not considered to be a viable option to locate the gas storage facility.

Following the initial scoping, it was determined that Sites B and C, which scored highest with 67 and 60 points respectively, merited further study. Further desktop and field studies were undertaken for sites B and C to assess their suitability in more detail.

Site B was considered to be a potentially viable option due to its exceptional convenience for accessing the main gas network at the Ballylumford Pressure Reduction Station immediately adjacent to the site and there would be no disturbance to nearby residential areas in making the gas network connection. Likewise, the 110kv electricity substation also immediately borders the site this eliminating the need for lengthy electricity and gas connections. Much of the site is a brownfield site, having been used during the construction of the Power Station's "C" Station. The gas facilities and brine plant would not appear out of context with the current industrial appearance of the power station. However, the site is on top of basalt, thus making drilling of the wells more laborious and noisy. Furthermore, as will be discussed in Chapter 3 "*Site Description*", part of the site was also previously used to dispose of waste ash from the power station and is currently at risk of landslip. If used, this part of the site would require substantial geotechnical and drainage work including monitoring for contamination.

Site C was also considered to be a potentially viable option as it is not neighbouring any houses and is within accessible range of the gas and electricity infrastructure, without

needing to disrupt road access or residents. Site C is also free of basalt bedrock, therefore making drilling of the wells significantly easier and less disruptive. However, the site is on a relatively unspoilt section of coastline and locating the gas plant and brine pumping facilities at this site would cause significant visual impact as the buildings would be viewed entirely within the context of agricultural land. Options for a suitable route for the sea water intake and brine outfall pipelines were also more limited at Site C than Site B.

Subsequent to the desktop and field studies, a proposal was made to consider a combination both Sites B and C. By locating the wellpad within Site C, the need to drill the wells through basalt is eliminated. It would also mean that disturbance of the former ash disposal area in Site B is avoided. Retaining the buildings in Site B would reduce the visual impact, as they would be read in the context of the existing power station complex. The gas, brine, sea water and power/control connections between the two sites could be made by directional drilling, thus avoiding disturbance at the surface between the sites.

The Site B and Site B & C options were presented to the public at the Public Consultations in June 2009. Visitors to the public display were asked to comment on whether they had a preference for either wellpad site. Within the questionnaire responses submitted there was no clear preference expressed, however direct consultation with local interest groups and residents indicated that locating the wellpad at Site C and not within the former ash disposal area was the preferred option.

1.4.1.3 Alternative Locations for Sea water intake and Brine Outfall pipelines

A similar desktop scoping exercise was undertaken to determine available corridors for the sea water intake and brine discharge pipelines.

Several factors were considered in choosing potential intake/outfall locations:

- Legislative factors
 - Environmental Designations (SPA, ASSI, RAMSAR)
 - E.U. Shellfish Waters Directive
- Physical factors
 - Water depth and areas with suitable current speeds and mixing potential
 - Sensitive habitats
 - Topography
- The Port of Larne
- Bathing Areas

Brine Outfall

Offshore constraints to locating the outfall pipeline were mapped in using Geographic Information Systems (GIS) (shown as the areas shaded in red on Figure 1.9). It was determined very early in the scoping study that it would not be acceptable or appropriate to discharge any brine within Larne Lough itself as it suffers from poor mixing and the brine

would not be able to be adequately dispersed. Therefore, possible routes to bury a pipeline extending into the North Channel were investigated.

Option 1

The eastern shore of Islandmagee is mostly basalt cliffs, the southern portions of which are designated as ASSI. A corridor to the eastern shore, culminating in a viable access to the shoreline was identified parallel to the route of the SNIP gas pipeline on its southern side. The southern side was chosen in preference to the northern side as the northern side would bring the pipelines through a larger area of sensitive habitats and would have to avoid an archaeological exclusion zone, bringing it closer to several houses. During the construction of the SNIP, an access lane to the foreshore within Castle Robin Bay had been made; therefore access for plant machinery to the shore would be feasible. Water depths and current speeds increase rapidly offshore of this point and the outfall would not have to travel far offshore to reach an area where suitable dispersion of the brine could be achieved.

Option 2

An alternative corridor was identified running alongside the Ballylumford Road, before following the Ferris Bay road for a short distance, then passing adjacent to a caravan park before travelling along the shoreline at Larne Golf Club, eventually travelling offshore at Barr's Point. This outfall area was considered to be less suitable as the outfall would need to travel much further offshore to reach deeper water and faster current speeds. This pipeline route would cause significantly more disturbance to local residents as it would mean at least partial closure of the Ballylumford and Ferris Bay roads during construction and would also bring considerable disruption to Larne Golf Club.

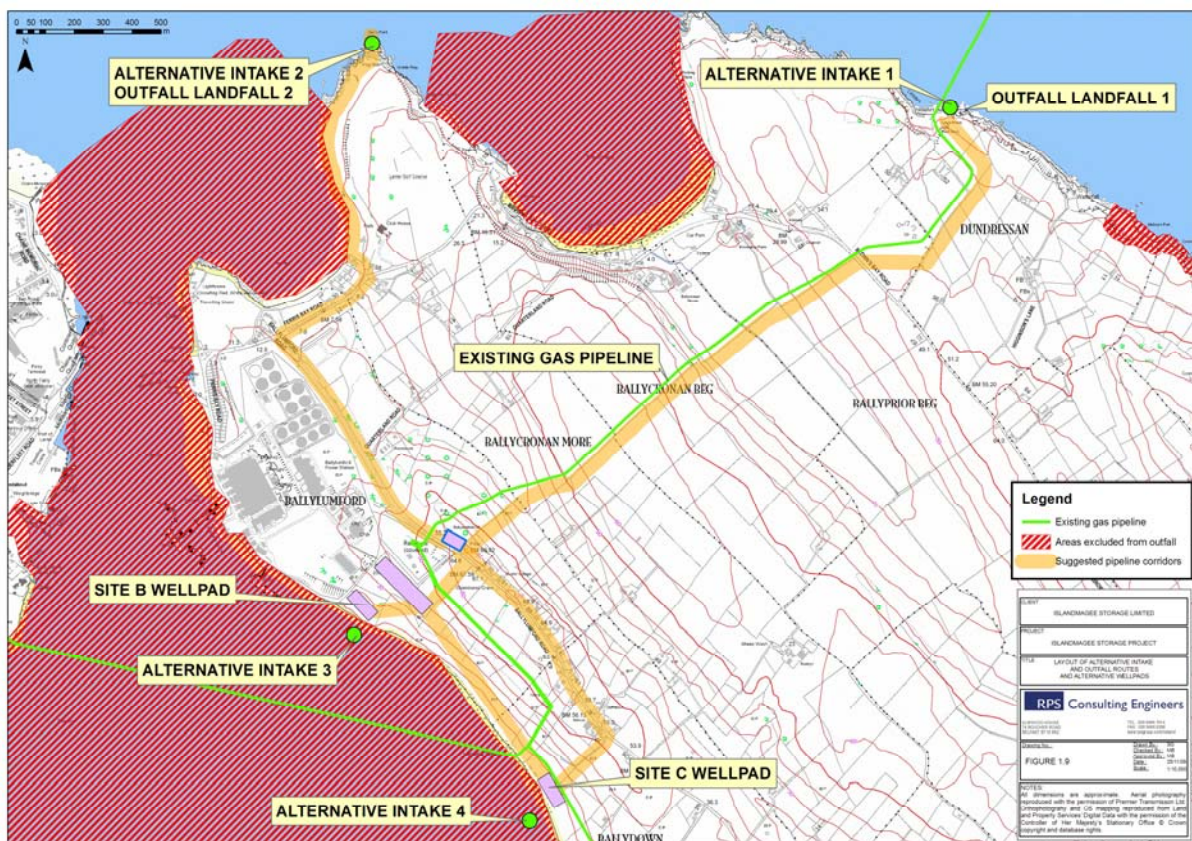


Figure 1.9 Identified intake sites and intake/outfall pipeline corridors

Both Corridor Options were subjected to a baseline walkover ecological survey, however neither route was found to have any particularly sensitive habitats which might preclude its selection. Corridor 1, parallel to the SNIP, was ultimately chosen as the preferred route, as its construction would cause a lesser amount of disruption to local residents as well as the Port of Larne during the outfall construction.

Subsequent to the selection of Corridor 1 as the preferred option, further studies determined that the distance offshore to deep water and suitable current speeds for dispersion was within the limits for horizontal directional drilling (H.D.D.) to be an option for construction. H.D.D. of the outfall could be undertaken from an entry point at the top of the cliffs and would tunnel the outfall beneath the base of the cliff and beneath the sea bed, only breaking through the surface in the vicinity of the outfall discharge point. This trenchless construction method would significantly reduce the potential impact to benthos and fisheries during construction.

Intakes

Four locations for the sea water intake (also shown in Figure 1.9) were examined and were also presented to the public during the public consultations in June 2009. These were:

- Option 1, located in Castle Robin Bay, within the brine outfall corridor 1
- Option 2, located on Barr's Point, within brine outfall corridor 2
- Option 3, located within Larne Lough adjacent to the Site B wellpad
- Option 4, located within Larne Lough adjacent to the Site C wellpad

Intake options 3 & 4 are closest to the wellpad areas, thus requiring minimal construction works. However, Islandmagee Storage Limited felt that, if possible, works within the Lough should be avoided to prevent any potential adverse impacts on the SPA, ASSI and Ramsar designations, as well as the EU Shellfish water designation.

Option 2, originally identified as a potential outfall location, was also considered as an intake option as it has favourable water depths close to the shore and a pumping station could be designed to visually remain in keeping in with the existing fog horn building. The topography between the Option 2 intake and the brine leaching plant also made the technical aspects of pumping the sea water relatively easy. However, this option would still cause significant disruption to the Ballylumford and Ferris Bay roads and Larne Golf Club during the construction phase.

Option 1, paralleling the brine outfall pipeline and locating the pumping station within Castle Robin Bay would be more difficult to construct, particularly as the sump for the pumping station would require to be excavated into rock, close to the existing SNIP. The pumping station would, however, not be visible except from on the foreshore itself or from sea. The undulating topography between the intake site and the brine leaching plant would mean that high-specification pumps would be required to produce the amount of head necessary to overcome the 70m high point at Ballycronan More. However, this route would permit both

the intake and outfall pipelines to be located within a single trench for the majority of their 2.5km length, thus reducing the footprint of impact to residents and terrestrial habitats.

Both Options 1 & 2 will require a power supply and control cables to be run out to them from the brine leaching facilities; there are no power connection points nearby with sufficient capacity.

When presented to the public, 43% of the visitors to the June 2009 public consultations expressed a preference for Option 1. It was therefore decided that locating the intake at Castle Robin Bay and minimising disruption to a single stretch of pipeline route would be advanced as the preferred option.

1.4.2 Alternative Designs

The specialist type of equipment required for this type of development means that alternative designs for the buildings and equipment themselves are limited. The compression and pumping equipment is designed to the highest specification and contained within soundproofed buildings which have proprietary cladding systems. However, Islandmagee Storage Limited has given careful consideration to the floor levels and colour schemes of buildings to mitigate against visual impact and will be employing landscaping techniques to further reduce the visual impact of the buildings. This will be discussed in more detail in Chapter 11 *"Landscape and Visual Impact"*.

Islandmagee Storage Limited have also undertaken to employ trenchless pipe laying techniques along sections of the pipeline route to mitigate against impacts in sensitive areas. Where possible, existing vegetation will be retained and to reduce the footprint of the facilities a construction set-down area has been identified on an area of existing hardstanding approximately 800m from the site of the main gas and brine facilities. The facility's equipment will be pre-assembled off site and transported to the site in modules to reduce the footprint required for construction and the amount of waste packaging to be transported off-site.

1.4.3 Alternative Processes

1.4.3.1 Alternative uses of Waste Brine

RPS undertook a desktop study (Appendix 1.2) to investigate whether the waste product from the leaching activities, a concentrated brine, could be reused in any local industry thus reducing or preventing the need to discharge the brine into the sea. The results of the desktop study are summarised below.

Food Processing

Within Northern Ireland there are relatively few industries which utilise large quantities of brine. A review of the food industry was undertaken but only one meat processing plant in

Northern Ireland was identified as having potential for using brine in any significant quantities. Three cheese production companies were identified within the Republic of Ireland which use brine for the production of “feta” style cheeses to which brine delivery may potentially be feasible. However, the transportation of super saturated brine is difficult as it is corrosive and these industries would potentially use a very minor proportion of the brine output, thus still requiring an alternate means of disposal. Therefore, using the brine within the food industry was not considered to be a viable alternative.

Chemical Industry

Micro-Bio (Ireland) Ltd is Ireland’s only manufacturer of Chlor-Alkali products. Located in Fermoy Co. Cork, the company manufactures Caustic Soda Liquor, Hydrochloric Acid, and Sodium Hypochlorite using electrolytic cell membrane technology. However the site is logistically very far from the proposed works at Islandmagee and as such it would be impractical to transport large quantities of brine from Islandmagee to Fermoy and this was not considered to be a viable alternative.

Textiles

From the early 1950s to the late 1970s the town of Carrickfergus (approximately 13 miles by road from the site) was a significant textiles centre. Two large textile companies were in operation: Courtaulds, specialising in rayon, and ICI who manufactured polyester and polypropylene yarns (Carrickfergus Borough Council, 2009). However, due to increasing competition from the Far East in producing cheaper fabrics, both factories closed in 1981 with a resultant loss of 3,700 jobs. The textile industry in Northern Ireland is now largely confined to the North West region but has significantly declined with only a handful of major manufacturers remaining, who are mostly involved in assembling clothing using imported fabric and therefore would have limited requirement for salt. The last tannery in operation in Ireland closed in 2004 (BBC, 2004).

Salt Products

It is unlikely that any of the above mentioned industries could make a significant contribution to the disposal of the estimated 26.9 million cubic metres of concentrated brine which will be leached from the caverns. In terms of quantities of salt to be extracted, an average volume of 840,000 cubic metres of salt per year over four years will be leached in order to create sufficient space for gas storage. To reuse the brine for white salt production, major evaporation works would be required; involving a significant capital investment and a substantial land bank. The works could be based around large heat pans which evaporate water from the brine to produce salt, or a complex vacuum process which evaporates the water through several stages, producing increasingly concentrated brine at each stage, and eventually white salt.

The British Salt works at Middlewich, Cheshire uses a six stage evaporation process which it claims gives superior efficiency and product quality compared with large pan evaporation. The six stage evaporation process requires considerably lower energy inputs than large heated pan evaporation, as well as operating over a much smaller area than large pans. British Salt considers their Middlewich, factory to be one of the most modern in Europe, using the latest production technology and incorporating advanced ecological planning to ensure

self-sufficiency, maximum production efficiency and forward-looking environmental disciplines. Nonetheless, despite this, the factory occupies a considerable footprint (approximately 12.5 hectares excluding additional open area storage and brine pond areas, seen below in Figure 1.10).

The factory produces 100 tonnes of salt per hour, 24 hours a day, 355 days per year, resulting in an overall output in the region of 852,000 tonnes per annum. At Islandmagee a factory capable of a similar output to the British salt works at Middlewich would be required in order to cope with the quantities of brine being produced by the leaching process. However, the factory would be decommissioned after only 4 years, unless further brine pumping took place in order to feed the works. Additional problems arise as transport of salt would be necessary, resulting in around 31,500 HGV trips to and from the site per annum (each with 27 tonne capacity); representing an average of over 178 HGV movements per day to and from the site.

The British Salt factory at Middlewich relies greatly on outlying processed food and chemical industries which have been established over decades as a result of the long-standing presence of salt works in the locality and which take a significant proportion of the factory's output directly through conveyor belts and rail links as well as its own dedicated fleet of bulk tanker HGVs.

In response to short-term shortages in supply of rock salt for road gritting in recent years due to unpredicted cold snaps in England, British Salt added a re-crystallised de-icing rock salt to their range of products. As already discussed above, Irish Salt Mining, based in Carrickfergus also produces de-icing salt, mined from the Triassic salts in this area using conventional mechanical methods. At present, their output is approximately half a million tonnes (approximately 435,000m³) of rock salt per year. The brine extracted from the caverns at Islandmagee would represent approximately twice the present day annual output of the salt mines. If a purpose-built salt manufacturing plant were constructed to evaporate the brine to create a rock salt similar to British Salt's "Glacia" de-icing product, the additional salt arising through the extraction of brine from the proposed gas storage caverns at Islandmagee could only sustain road salt production at current levels for a maximum of eight years. RPS do not consider this to be a viable option in terms of economic or environmental sustainability.



Figure 1.10 British Salt Factory, Middlewich, Cheshire

Image reproduced with permission from Google Earth® 2009

The options to re-use the extracted super-saturated brine within any existing industry in Northern Ireland are extremely limited. Evaporating the brine to recrystallise salt into either white salt, PDV for food processing or coarse rock salt would require the construction of a manufacturing plant which would require a very substantial landbank and consequently a greater environmental footprint than the gas storage facilities themselves. In addition to this, a feasible means of transporting the finished product, such as extension to the existing railway network or sub-surface pipelines, (likely to cause significant additional environmental impact) would be required as the road network at the site is not capable of sustaining large volumes of HGVs. Furthermore, there would be insufficient annual demand for the quantities of finished salt arising from the brine leaching process within Northern Ireland or indeed the island of Ireland to accommodate the product and therefore it would be likely that export markets would have to be established, which is unfeasible for such a short-term period. It is therefore considered that the most environmentally and economically sustainable means of disposing of the leached salt from the gas storage caverns is by returning it to the sea.

1.4.3.2 **“Do Nothing”**

The need for a gas storage facility within Ireland has already been discussed in some detail in Section 1.3 above.

Should no gas storage facilities be constructed within Northern Ireland, in the event of a cut in supply to Ireland from Great Britain, both Coolkeeragh and Ballylumford Power Stations, which collectively provide more than 60% of Northern Ireland’s electricity generation, will be forced to revert to their back up power generation methods, namely gas oil or distillate.

Kilroot power station, the only non-gas fired power station in Northern Ireland (it is dual oil/coal fired), has recently had a planning application approved for a gas pipeline to connect to the northern Irish gas network with a view to adding a gas generator. It is doubtful whether the backup oil facilities at Ballylumford, liquid distillate at Coolkeeragh and the coal/oil facilities at Kilroot would be able to sustain peak generation capacity for any prolonged period of time, especially as oil storage facilities are relatively limited at each of the sites and regular deliveries would be required.

Electricity could be imported via the Moyle Interconnector, however a cut in gas supply from GB might mean that gas supplies within GB itself are also limited, thus reducing the generating capabilities there as well.

In the case of a supply disruption to GB, either temporary, for example, LNG tankers caught up in storms offshore and unable to unload their cargoes, or longer term interruption to supplies from Africa, the Middle East or Russia, the pressure in the gas network may drop. A minimum pressure must be maintained within gas transmission networks for safety reasons and as the pressure drops, power stations and businesses will initially be interrupted before domestic customers. Ultimately domestic customers are progressively disconnected. In this scenario, reconnection of domestic customers can take several months, even after gas supplies have been reinstated, as all appliances must be inspected and checked that they are switched off before domestic supplies can be restored.

An interruption to domestic gas supplies could have serious health implications, especially in winter as these gas-fuelled properties would not have central heating. Some of the social housing provided by the housing executive and local councils has been converted to gas and therefore some of the most vulnerable members of the community would be at risk of illnesses exacerbated by cold homes.

Islandmagee Storage Limited do not consider the “do nothing” option to be feasible in Northern Ireland and believe that a gas storage facility is the only means of ensuring security of supply to Northern Ireland.

1.5 Planning Policies

This chapter examines the planning policies relevant to the study area. A brief description of development is provided in addition to an assessment of the proposal against prevailing Regional and Local Planning Policy.

1.5.1 International Context

Northern Ireland is now connected to the British natural gas supply system by a pipeline which crosses the Irish Sea from near Stranraer to Islandmagee. From its land-fall at Castle Robin a 3 km high-pressure pipeline has been laid to a pressure reduction station adjacent to Ballylumford Power Station. From Ballylumford a network of pipelines supply natural gas to industrial, commercial and domestic customers throughout Northern Ireland, including the major power stations at Ballylumford and Coolkeeragh..

Over the past 40 years the UK and Ireland have significantly increased their use of gas so that it now forms a major portion of its energy supply. This situation evolved due to the plentiful, low cost supplies of gas that were easy to access from the North Sea and Irish Sea. These reserves are now declining and the UK and Ireland are becoming increasingly dependant on gas imports, principally from countries like Norway and Russia. This has implications for security of supply, particularly during periods of peak demand, and it is envisaged that gas storage facilities will play an important role in stabilising supply and future energy prices for the UK.

At present, storage capacity in the UK stands at around five percent of annual demand, compared with an average of around twenty percent in other Northern European countries. The Department for Energy and Climate Change (DECC, formerly known as BERR/DTI), has acknowledged the need for additional gas storage in the UK, citing in its 2006 Energy White Paper, the need for additional gas storage facilities to be developed.

A gas storage facility in Northern Ireland would permit greater competition in supply and would also ensure a secure emergency gas supply for Northern Ireland of more than 60 days if the gas supply to the island of Ireland was cut off from the rest of Europe. Currently 60% of Northern Ireland's electricity supply comes from gas fired power stations; therefore security of supply is of critical importance to the country.

The Northern Ireland Programme for Government 2008-2011 sets out the Executive's plans and priorities as well as some of the longer-term aspirations and intentions. One of the identified priorities is to deliver a modern, sustainable, economic infrastructure to support business by, inter alia, opening up energy markets to external competition and ensuring access to alternative energy sources. To support this, the Executive indicated that research would be taken forward on issues such as developing of the electricity grid, ensuring diversity and security of energy supplies and improving links with Great Britain.

Following on from that commitment, the Department of Enterprise Trade & Investment recently produced its Draft Strategic Energy Framework for Northern Ireland 2009. The

Strategy confirms that the Northern Ireland Government is already working hard to ensure access to secure, competitively priced and sustainable energy supplies, whilst supporting economic growth and recognising the need to address fuel poverty. The stated objective of the Strategy is therefore to achieve a competitive, sustainable, long-term future for energy in Northern Ireland, through innovative and ambitious actions, involving shared objectives with industry and partners throughout the rest of the United Kingdom and the Republic of Ireland. Improving coordination across Northern Ireland and working in partnership with others in the energy arena will be essential given the scale of challenges associated with climate change and security of supply.

Energy security is an issue of common European Union concern. With growing integration of regional energy markets and infrastructure, specific national and local solutions are often insufficient. The Department is therefore working with its counterparts in Great Britain and in the Republic of Ireland on complementary measures to strengthen both jurisdictions' security of energy supply. The aim is to also address the regional infrastructure links with Great Britain in the context of United Kingdom and European Union energy security policy. It is recognized that the Northern Ireland gas market is vulnerable due to its high dependence (approximately 93%) on externally sourced fossil fuels for power generation, with two out of three power stations using gas piped via Scotland. As some 70% of the UK's gas will be imported by 2017 (National Grid, 2008), it is anticipated that there could be significant benefits from local gas storage facilities and access to alternative sources such as LNG. The Department has placed on record that it welcomes renewed commercial interest in gas storage which would help promote greater stability in relation to gas and potentially electricity prices and provide a significant increase in security of energy supply. In conjunction with counterparts in the Republic of Ireland, DETI completed a study into gas storage and liquified natural gas (LNG) on the island. The study concluded that gas storage would be of significant benefit to both parts of the island in terms of security of supply. The Department has commissioned research into the potential for energy storage in the East Antrim area.

1.5.2 Planning Control

Article 11 of the Planning (NI) Order 1991 defines development as being "the carrying out of building, engineering, mining or other operations in, on, over or under the land or the making of any material change of use of any buildings or other land." Under the terms of Section 6 of the Interpretation Act (NI) 1954, the Planning Order (NI) Order 1991 applies to the whole of the portion of Northern Ireland that is within the jurisdiction of the Parliament of Northern Ireland. Planning control as a consequence is exercised as far as the low water mark. Any development taking place beyond the low water mark is therefore outside the scope of planning control and within the Crown Estate Licence Area. As such this is subject to other consent procedures as outlined in Section 1.6.3.

Planning Policy Statement 1: General Principles outlines the Department of Environment's approach to planning and those matters that are material in determining any planning application. The Department will base its decisions on planning applications on planning grounds alone. It will not use its planning powers to secure objectives achievable under non-planning legislation, such as the Building Regulations, the Water Act or other consent

processes. The grant of planning permission does not remove the need for any other consents, nor does it imply that such consents will necessarily be forthcoming. Where such other regulatory machinery applies, those issues covered by the separate consent processes will only be taken into account where their consideration remains material in planning terms.

1.5.3 Regional/Local Policy

Within Northern Ireland, a hierarchy of planning policy influences future development of the region. The hierarchy of planning documents consist of:

- **Regional Strategies** which provide an overall vision for the region;
- **Planning Policy Statements** which outline prevailing policies in relation to particular aspects of land use planning as they apply to the whole of Northern Ireland;
- **Development Plans** which provide details regarding land use issues in local areas;
- **Supplementary Planning Guidance** which includes all other documentation relating to a given area. These documents may be material considerations to be taken into account when assessing any development proposals.

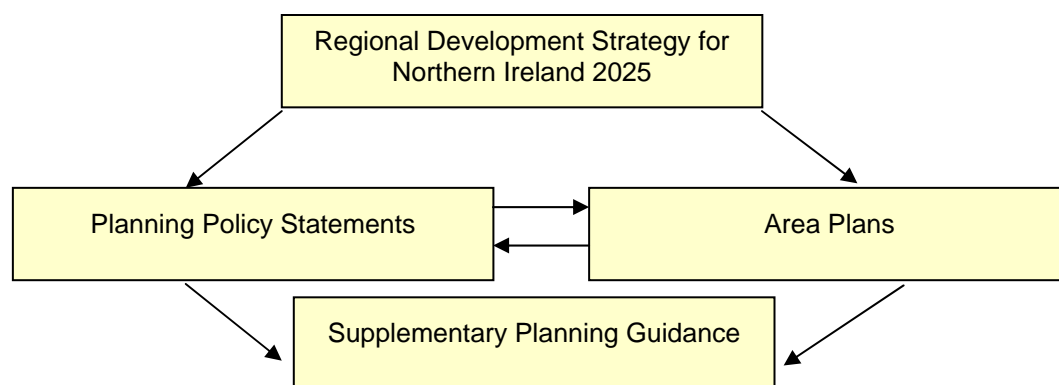


Figure 1.11 Planning Hierarchy

1.5.3.1 Regional Development Strategy for Northern Ireland 2025 (RDS) **“Shaping Our Future”**

The Regional Development Strategy (RDS) was prepared by the Department for Regional Development (DRD) under the provisions of the Strategic Planning (Northern Ireland) Order 1999. Following extensive consultation it was adopted in September 2001 with the purpose of shaping the future over the next 25 years. The RDS is an overarching strategic planning framework with a shared vision *“to create an outward looking dynamic and liveable region and to sustain a high quality of life for all”*.

Moving beyond typical land use planning, the RDS has a holistic approach to planning which appreciates the need to consider economic, social, transportation and environmental issues. Principles of sustainability and sustainable development are central to the entire Strategy, striving as it does to meet the four key objectives of:

- Social progress which recognises the needs of everyone;
- Effective protection of the environment;
- Prudent use of natural resources; and
- Maintenance of high and stable levels of economic growth and employment.

Global climate change is identified within the RDS as an issue to be taken into account in planning the future development of the region. An objective of the Strategy is to emphasise the importance of cutting environmental costs generally by reducing the consumption of natural resources and energy from non-renewable sources and increasing the amount of waste material that is recycled rather than dumped.

The Strategy acknowledges that among the forces driving change are environmental concerns including the challenge *“to reconcile the aspirations of a consumer driven society with wider obligations to maintain a viable environment that can be passed onto the next generation.”*

To promote balance and integrated growth across Northern Ireland, Chapter 5 of the Regional Development Strategy proposes a Spatial Development Strategy (SDS). This is a hub, corridor and gateway framework designed to, among other things:

- Facilitate economic growth by identifying a network of locational opportunities for investment and development; and
- Create conditions for improved and equitable access to a range of employment, commercial, health, education and community services across urban and rural areas

This Strategy divides Northern Ireland into three principle component areas:

- Belfast Metropolitan area and hinterland;
- The major regional city of Derry and its sub-region; and
- Rural Northern Ireland, comprising the main and small towns and their catchment areas.

Accordingly the site and its hinterland is situated within Rural Northern Ireland. The Port of Larne, a short distance west of the site across the entrance to Larne Lough, is designated as a Main Hub with a Major Inter Regional Gateway Role. Furthermore, Larne is also located on the Belfast Metropolitan Area – Derry Key Transport Corridor.

In relation to Rural Northern Ireland, Chapter 8 asserts that the overall aim of the Strategy is to develop an attractive and prosperous rural area, based on a balanced and integrated approach to the development of town, village and countryside, in order to sustain a strong and vibrant rural community, contributing to the overall well-being of the Region as a whole.

To achieve this, the RDS proposes a number of strategic objectives including:

- Supporting the development of a strong, diversified and competitive rural economy served by the Regional Strategic Transport Network (SPG-RNI 1).

Strategic Planning Guideline RNI -1.2 gives a commitment to facilitate the development of rural industries, businesses and enterprises in appropriate locations.

Chapter 10 of the RDS concentrates on supporting economic development. It strives to achieve sustainable regional growth and acknowledges that the creation of new jobs is a key priority in meeting the needs of a growing workforce and tackling long-term unemployment.

A great deal of emphasis is placed on the location of economic development opportunities. SPG-ECON 1 aims to promote a balanced spread of economic development across Northern Ireland and the urban hubs. The policy proposes to provide a network of development opportunities and ensure a generous and continuous provision of land for employment purposes.

Furthermore, ECON 1.2 highlights that economic opportunities should be directed towards hubs/clusters located on key transport corridors and in or accessible to the most disadvantaged urban areas to tackle long-term unemployment.

Chapter 12 of the RDS stresses the need to care for the natural environment.

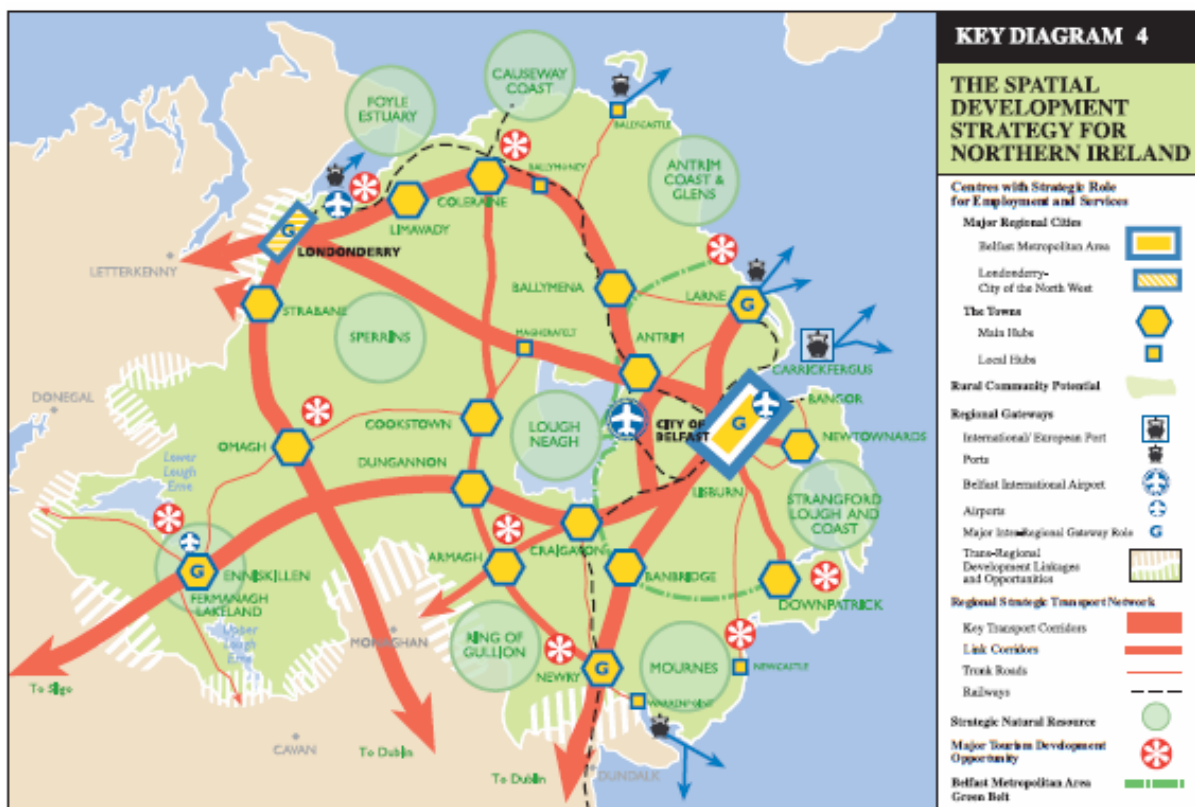


Figure 1.12 Spatial Development Strategy

Source: Regional Development Strategy for Northern Ireland (2025)

1.5.3.2 Area Plan

Development Plans set out the broad land-use and policy framework for the physical development of designated areas for a specified duration of time. The site is located within the Larne Borough Council Area.

At present the prevailing plan is the Larne Area Plan 2010. In May 2002 the Antrim, Ballymena and Larne Area Plan 2016 – Issues Paper was also published. In the interests of thoroughness this document is also considered below.

Larne Area Plan 2010

Infrastructure associated with this development will be dispersed over a wide area although all land based infrastructure is to be entirely contained within the northern portion of the Islandmagee peninsula. The main structures consisting of: Gas Plant Facilities; Sea Water and Brine Pumping Facilities; Well Pad; and Temporary Construction Set-Down Areas are located proximate to the B90 Ballylumford Road and a short distance south of the existing power station. The Sea Water Intake Pumping Station is on the opposite side of the headland. Sub-surface pipelines will connect the different elements of the proposal.

According to the extant Plan, the relevant subject area is designated as a Countryside Policy Area (CPA). These areas are established through the development plan process to inter alia, safeguard the countryside from inappropriate development - protecting areas under pressure from development, protecting the visual amenity of areas of landscape quality and maintaining the rural character of the countryside.

Antrim, Ballymena & Larne Area Plan – 2016 – Issues Paper

Following the “Notice of Intention to Prepare a Development Plan” for the Antrim, Ballymena and Larne Areas in March 2001, the Department appointed consultants to independently liaise with the public and a variety of groups including community, voluntary and environmental organisations in relation to their issues of concern. The issues paper was published in May 2002 and the Department invited representations for a 14 week period, ending on 30th August 2002. The independent consultants continued liaising with the public regarding the issues paper before finally submitting a report to the Department in August 2002.

The Issues Paper recognises and embraces, “sustainable development based on stewardship of the environment and has widened the concept to embrace economic and social considerations. Development to satisfy the requirements of today’s society should not compromise the potential for future generations to satisfy theirs.”

At present Planning Service has ceased to carry out any further substantive work on the preparation of the Antrim, Ballymena and Larne Area Plan 2016 pending the outcome of the legal rulings in relation to lawfulness of draft Northern and Magherafelt Area Plans.

1.5.3.3 Planning Policy Statements (PPS)

PPS 1 – General Principles

Paragraph 59 of PPS1 states that the Department's guiding principle in determining applications is that development should be permitted, having regard to the development plan and all other material considerations, unless the proposed development will cause demonstrable harm to interests of acknowledged importance.

PPS 2 – Planning & Nature Conservation

This document describes the statutory framework for the protection of designated areas and outlines the criteria that Planning Service will employ in determining planning applications that might affect nature conservation interests. Paragraph 63 states that, "Careful consideration will be given to the nature conservation implications of any development proposal where it is known to the Planning Service that the development may threaten any protected species of flora or fauna, any area of wetland defined in the Ramsar Convention, or any other significant features of nature conservation value".

PPS 3 – Access, Movement & Parking

PPS3 sets out the policies relating to access to the public road network and the construction of new accesses or the intensification in use of existing accesses onto that network.

Among the main objectives is promoting road safety for pedestrians, cyclists and other vulnerable road users and promoting measures to mitigate adverse transport impacts. Policy AMP2 is concerned with access to public roads. It states that, "Planning permission will only be granted for a development proposal involving direct access onto a public road where: a) Such access will not prejudice road safety or significantly inconvenience the flow of traffic; and b) The proposal does not conflict with Policy AMP3, Access to Protected Routes."

Neither of the outlined sites will impact upon any designated protected routes.

PPS4 – Industrial Development

"This Statement is relevant to all uses of land involving the carrying out of any industrial process or research and development into industrial products or processes." (Para. 3 - PPS 4)

As recognised in paragraph 28, it is not always appropriate to separate industry from rural or residential areas for which they provide employment and services, however proposals will be expected to meet the following criteria:

- They must be compatible with the character of the surrounding area;
- They must be compatible with adjacent land uses, especially housing;

- They must not be likely to cause detriment to valuable areas or features of nature conservation interest or man-made heritage;
- They must, where possible, avoid the loss of high grade agricultural land;
- They must not result in a significant increase in traffic congestion or be a hazard to road safety;
- They must not be likely to cause or exacerbate flooding; and
- They must be capable of dealing satisfactorily with any emission or effluent.

Proposals for potentially offensive or hazardous industrial development will be carefully considered to ensure the public would not be placed at high risk. Decisions will be based on the precautionary principle that where there is uncertainty, the protection of the environment will generally be paramount unless there are imperative reasons of overriding public interest.

It is accepted that some new major industrial projects may require sites outside settlements due to size of locational requirements. These will be assessed taking account of

- The contribution of the proposed development to the Northern Ireland economy;
- The availability of alternative sites; and
- The environmental effects.

There is an onus on developers to demonstrate an overriding reason for the proposal in the interest of the region as a whole, and that there are site specific reasons for choosing the site.

Draft PPS4 – Industry, Business and Distribution

Among the main objectives of this Statement are:

- To promote sustainable economic development;
- To tackle disadvantage and facilitate job creation in an environmentally sensitive manner;
- To ensure the provision of a generous supply of land suitable for business and industry and a choice and range in terms of quality, size and location.
- Integration of transport and economic development;
- Encouraging high quality new developments; and
- Protecting the environment.

Policy IBD 1 outlines general criteria to be considered when assessing proposals for industry, business or distribution. Among these are included:

- It is compatible with the character of the surrounding area and adjacent land uses;
- It will not cause or exacerbate flooding;
- It will not create a noise nuisance;
- It is capable of dealing satisfactorily with any emission or effluent;
- Satisfactory landscaping arrangements will be provided;
- It will not result in a significant increase in traffic congestion or be a hazard to road safety; and
- Adequate access, parking and manoeuvring areas will be provided.

Policy IBD 6 relates that Major Industrial Development in the Countryside will be permitted in accordance with the policies of IBD 12. Accordingly, this states that such proposals will only be permitted in the countryside where they comply with all the following criteria:

- It is a firm proposal of overriding importance that will make a significant contribution to the regional economy;
- The long-term economic benefits can be clearly articulated;
- Alternative sites are not available;
- The development can be successfully integrated into the landscape;
- The buildings and associated development infrastructure are of a very high standard; and
- It would not generate traffic of a type or amount inappropriate for the character of access roads or would require improvements which would damage the character of these roads.

PPS6 Planning, Archaeology & the Built Heritage

PPS6 sets out the Department's policy for dealing with development proposals that are in proximity to, or may affect sensitive locations including: archaeological sites and historic monuments, conservation areas, areas of townscape character, historic parks and listed buildings.

PPS15 Planning & Flood Risk

Among the main objectives of this Statement are to:

- Adopt a precautionary approach by ensuring that both the available scientific evidence and the scientific uncertainties which exist in relation to flood risk are taken into account when determining planning applications; and
- Ensure that new development is not exposed to the direct threat of flooding and that it does not increase flood risk elsewhere.

Planning Service will consult Rivers Agency for advice on the nature and extent of flood risks where the circumstances are appropriate. Such circumstances will include where development is proposed within riverine or coastal floodplains.

Draft PPS21 – Sustainable Development in the Countryside

The provisions of Draft PPS21 will take precedence over a number of provisions within “A Planning Strategy for Rural Northern Ireland.” Of relevance to the study area is the replacement of Policy GB/CPA1 - Designation of Green Belts and Countryside Policy Areas. As a consequence, presently the policy provisions of Draft PPS21 precede those relating to Green Belts contained in existing statutory and published development plans.

Policy CTY 1 states that planning permission will be granted in the countryside for industry and business uses in accordance with PPS4 – currently under review.

1.5.4 FURTHER CONSIDERATIONS

1.5.4.1 Minister's Statement -May 2009 - on Weight to be Given to Economic Considerations

On 11th May 2009, the then Minister of the Environment made a statement to the Assembly that sought to underline the importance that the Minister decreed should be attached to ensuring the planning system makes its contribution to the growth of our economy. He recognised that the Executive's Programme for Government makes economic growth and wealth creation our top priority, to be taken forward in a fair and sustainable manner. This strategic priority is echoed as a key theme underlying the planning system that seeks to deliver economic development while protecting and enhancing the environment.

The Minister advised the Assembly that there are some Planning Policy Statements in the pipeline that will facilitate economic development both in settlements and the open countryside and he looked forward to publishing the revised and updated PPS4, which concerns economic development and has been awaiting Executive clearance since January 2009.

He also emphasised that the Department's guiding principal to development management is set out in Paragraph 59 of Planning Policy Statement 1: General Principles:

"in determining planning applications... development should be permitted, having regard to the development plan and all other material considerations, unless the proposed development will cause demonstrable harm to interests of acknowledged importance "

It is recognised that competing interests often emerge in the assessment of development proposals that requires the planning system to balance important social, economic and environmental considerations. The weight given to those is a judgement that lies with the decision-maker and will vary with each planning application. The Minister's Statement aimed to assist planning officers in coming to that judgement by clarifying the weight that should be given to economic considerations:

"That brings me to the main purpose of my statement. I want to give decision-makers the confidence and support to make judgements which will give greater weight to economic considerations where it is appropriate to do so. I want to give clarity and to leave no one in any doubt about how to deal with economic considerations. This is not a change of policy. The purpose of this statement is to provide certainty and to give guidance so that the planning system can play a positive role in encouraging investment and kick-starting regeneration. To that end, the following paragraph clarifies the weight that should be accorded to economic aspects in the making of planning decisions.

Full account shall be taken of the economic aspects of a planning proposal, including the wider benefits to the regional or local economy, alongside social and environmental aspects, in so far as they are material considerations in the determination of the planning application to which they relate. In cases where the

economic benefits of a proposal are significant, substantial weight shall be afforded to them in the determination of that planning application.”

1.5.4.2 Control of Major Accidents Hazards Regulations (Northern Ireland) 2000

These Regulations place a duty on operators to notify the Competent Authority, i.e the body responsible for enforcing the Regulations, of their activities. In relation to hazardous substances the Competent Authority is the Health and Safety Executive for Northern Ireland and the Northern Ireland Environment Agency of the Department of the Environment, acting jointly. The controls are designed to regulate the presence of hazardous substances so that they cannot be kept or used above specified quantities until the Competent Authority has had an opportunity to assess the risk of an accident and its consequences.

A portion of land cannot be designated as a COMAH site unless it has a Hazardous Substance Consent (HSC). This is required for the presence of controlled materials, on over or under the land unless the aggregate quantity of that present is under the controlled quantity for that substance. This is stipulated in Article 53 of the Planning (N.I) Order 1991. This consent is given by Planning Service.

To determine whether Hazardous Substance Consent is required the Planning Service use The Planning (Control of Major Accident Hazards) Regulations (Northern Ireland) 2000. This document outlines thresholds for the amounts of materials allowed to be stored on site. If the threshold is exceeded then the site requires Hazardous Substance Consent

The COMAH Directive requires land use planning controls to apply to all sites. Ballylumford Power Station is a designated COMAH site. The proposed gas storage facility is also likely to be designated as a COMAH site and therefore the cumulative impact is likely to have implications for the current land use planning controls in the area. An application for Hazardous Substances Consent is being made directly to the HSENI concurrently with the planning application; the HSC application will be accompanied by a full safety report prepared by safety consultants GL which includes cumulative safety impacts.

1.5.5 SUMMARY

On the basis of the above analysis of the above planning policy, the following summary can be made:

- The above planning policy documents relate to development on the land. The portions of the site below the low water mark are within the Crown Estates Licence Area and accordingly beyond the scope of planning control.
- **RDS** – The proposal is consistent with economic policies contained within the RDS. It will provide growth and employment within Rural Northern Ireland and in close proximity to a designated Gateway and Hub. This will assist in the spread of economic development opportunities. Sustainability is the inspiration for the Regional Development Strategy. It recognises that in order to be sustainable we must alter certain aspects of our lifestyle

and it promotes changes and measures to achieve this. The prudent use of natural resources is a key objective. Despite this the Strategy recognises that the increasing availability of this gas to the industrial and the domestic markets is expected to reduce greenhouse gas emission dramatically.

- **Area Plan** - The entire site is located outside any limit of development and within a Countryside Policy Area. Prevailing policy contained within draft PPS21 means this must be assessed using PPS4 (under review).
- **Planning Policy Statements** - The potential impacts of the proposed project on nature conservation, cultural heritage, landscape, water, soils & geology, air, noise and traffic have been rigorously assessed elsewhere in the Environmental Impact Statement. Where appropriate, mitigation measures are proposed and it is concluded that the implementation of those appropriate mitigation measures will render any residual impact to be of little significance and that the proposal conforms with the policy objectives of the relevant Planning Policy Statements.
- **Planning Policy Statement 4/Draft Planning Policy Statement 4** - Both of these Statements include provisions allowing for major industrial development in the countryside. In each case, such proposals must satisfy a number of criteria before they are successful, not least regarding its necessity and also site specific locational requirements. As established, given the levels of gas consumption in Northern Ireland, the existing storage capacity is completely inadequate. Should there be supply problems then the Region could be thrown into crisis. This proposal will help alleviate such concerns. Additionally the existing geological conditions, infrastructure and coastal location make this a potentially ideal site for this proposal.
- **Further Considerations – COMAH** – The proposed development is expected to be a “Top Tier” COMAH site. Islandmagee Storage Limited will ensure that adequate engineering or procedural safeguards will be in place to control risks for major accident scenarios and will be required to demonstrate under Control Of Major Accident Hazards Regulations (Northern Ireland) (COMAH) that risks are reduced to a level that is as low as reasonably practicable (ALARP). Before construction is allowed to proceed, and again before operations are allowed to commence, the regulatory authorities must be satisfied that safety aspects have been properly addressed.

1.6 Planning Legislation

Specific local legislation to control the development of land in Northern Ireland was first introduced in the early 1930s and for forty years local government administered the planning system.

In 1972 local government was reorganised and responsibility for planning control was vested in the Ministry of Development under the *Planning (NI) Order 1972*.

Responsibility for planning control was subsequently transferred to the Department of the Environment, which is now responsible under the *Planning (Northern Ireland) Order 1991* for planning matters.

Article 31 of the *Planning (Northern Ireland) Order 1991* enables the Department to deal with major planning applications under special procedures where they consider that the development for which the permission or approval is sought would, if permitted:

- involve a substantial departure from the development plan for the area to which it relates; or
- be of significance to the whole or a substantial part of Northern Ireland; or
- affect the whole of a neighbourhood; or
- consist of or include the construction, formation, laying out or alteration of a means of access to a trunk road or of any other development of land within 67 metres of the middle of such a road, or of the nearest part of a special road.

Where the Department considers that any or all of the circumstances described above are satisfied they may decide to apply the Article 31 procedures. In deciding whether to apply applications the Department will use the following criteria:

- the strategic significance of proposals
- the environmental effects of proposals
- the scale and nature of proposals.

The Department will apply Article 31 procedures to proposed developments that raise issues of strategic significance to Northern Ireland as a whole, or to a substantial part of the region. In assessing the strategic significance of proposals the Department will take account of :

- the relationship of the proposal to the Regional Development Strategy (RDS);
- its contribution to the broader policies and objectives of Government;
- any significant implications beyond NI.

1.6.1.1 Major Economic Developments

The RDS provides guidance on the type of projects of strategic significance that could be anticipated to fall into this category. These might include:

- the development of strategic employment locations

- projects in major economic development corridors, including those which may have the potential to serve extensive cross border catchments
- projects that may comprise a major development package bringing benefits in terms of improvements to regional infrastructure.

1.6.1.2 Major Infrastructure Projects

Major infrastructure projects comprise proposals for the provision of major transportation and service infrastructure by both the public and private sectors.

In deciding whether to apply Article 31 procedures to specific projects, the Department will take account of the scale of the proposals and their significance in contributing to the implementation of the RDS.

It is therefore likely that the proposed development, as it is a major infrastructural project of vital strategic and economic importance, will come under Article 31 and as such will be subject to a planning application to the Special Studies Unit.

1.6.2 The Planning (Environmental Impact Assessment) Regulations (NI) 1999

In June 1985, the European Communities adopted Directive 85/337/EEC which made the assessment of the environmental effects of a project a mandatory requirement for those projects likely to have a significant effect on the environment.

The Planning (Environmental Impact Assessment) Regulations (NI) 1999 came into operation on 14 March 1999 and replace the Planning (Assessment of Environmental Effects) Regulations (NI) 1989. The legislation introduces measures relating to the requirement for an assessment of the impact on the environment of projects likely to have significant effects on the environment. The Regulations transpose the Council Directives 85/337/EEC and 97/11/EC (amending the former) on the assessment of the effects of certain public and private projects on the environment into national law.

These Regulations require that an EIS should include an outline of the main alternatives considered for the project and give an indication of the main reasons for the choice of the preferred option, taking into account the environmental effects.

Schedules 1 and 2 of the Regulations set out a comprehensive list of project types subject to Environmental Impact Assessment (EIA).

Schedule 2 of the Regulations identifies those infrastructure projects, which require a determination as to whether applications must be accompanied by an EIS. The schedule identifies the infrastructure projects applicable and the threshold and criteria above which an EIS must be submitted in support of the planning application. Under Schedule 2, Section 10, Sub-section (k), oil and gas installations with an area of works greater than 1 hectare or,

in the case of a gas pipeline, with an operating pressure of greater than 7 bar gauge are subject to the Environmental Impact Assessment process and require a formal EIS.

The present proposal therefore falls within both of the aforementioned categories of the Regulations and is classified as EIA development within the meaning of the EIA Regulations.

Schedule 4 of the Regulations sets out issues, which should be included in an EIS. The EIS should include information referred to in Part 1 of schedule 4 as far as is reasonably required to assess the environmental effects of the development and which can be reasonably expected based on current knowledge and methods of assessment, but which includes at least the information referred to in Part 2.

Part 1:

- A description of the development;
- An outline of the main alternatives and the main reasons for the choice, taking into consideration the environmental effects;
- A description of the aspects of the environment likely to be significantly affected by the development, including population, fauna, flora, soil, water, air, climatic factors, material assets, including the architectural and archaeological heritage, landscape and the inter-relationship of these factors;
- A description of the likely significant effects of the development on the environment, including direct, indirect, secondary, cumulative, short, medium, long-term, permanent, temporary, positive and negative effects;
- A description of the measures envisaged to prevent, reduce and where possible offset any significant adverse effects on the environment;
- A non-technical summary of the information provided; and
- An indication of any difficulties encountered in compiling the required information.

Part 2:

- A description of the development comprising information on the site, design and size of development;
- A description of the measures envisaged in order to avoid, reduce and, if possible, remedy significant adverse effects;
- The data required to identify the main effects which the development is likely to have on the environment;
- An outline of the main alternatives and the main reasons for the choice, taking into consideration the environmental effects; and
- A non-technical summary of the information provided.

This EIS has been prepared in accordance with the above Regulations.

Additional environmental legislation specific to particular areas of environmental assessment have also been considered and are discussed in the individual impact assessments considered in this document. The list below identifies some of the additional key legislation that applies to this project

The Conservation (Natural habitats, etc) Regulations (Northern Ireland) 1995;
The Nature Conservation and Amenity Lands (Northern Ireland) Order 1985;
The Wildlife (Northern Ireland) Order 1985;
The Water (Northern Ireland) Order 1999

1.6.2.1 Conservation (Natural Habitats, etc) (Amendment) Regulations (Northern Ireland)

Article 6 (2) of the Habitats Directive 92/43/EC places a duty on all EU member states to avoid the deterioration of habitats and species within areas designated as Special Areas of Conservation (SAC). These requirements also apply to areas designated as Special Protection Areas (SPA). In order to facilitate this requirement, member states are further directed in Article 6 (3) to carry out an Appropriate Assessment on any plan or project on the declared site. The obligations highlighted in the Directive have been transposed into Northern Ireland legislation by the *Conservation (Natural Habitats etc) Regulations (Northern Ireland) 1995*, amended in 2004 and most recently by the *Conservation (Natural Habitats, etc) (Amendment) Regulations (Northern Ireland) 2007*.

Parts of Larne Lough are designated as an SPA, and are therefore a Natura 2000 site. Any plan or project likely to impact a Natura 2000 site cannot proceed without an Article 6 Assessment validating that there is no likely adverse impact on the site selection features. The proposed development is not considered likely to have an adverse impact on the Larne Lough SPA; however an Appropriate Assessment is required to be submitted within or alongside the EIS.

1.6.3 Other Consents

1.6.3.1 FEPA Licensing

In Northern Ireland the Department of the Environment is the competent authority under Part II of the Food and Environment Act (FEPA), 1985 to control deposit of articles in the sea. The purpose of Part II of the Act is to protect the marine environment, human health and minimise nuisance or interference to other legitimate users of the sea by controlling inputs into the sea up to the High Water Mean Spring (HWMS) tide mark. The Department operates a licensing system under FEPA, which regulates the deposit of substances or articles in Northern Ireland's territorial waters (from HWMS out to 12 nautical miles) or under the seabed, including the disposal at sea of dredged material, construction work and the reclamation of land.

From early 2011, a new marine licensing regime will regulate development in the marine environment, replacing the current FEPA licensing system. The new legislation is being prepared in response to the UK Marine and Coastal Access Act 2009, which mainly affects England and Wales, and the Northern Ireland Marine Bill, which is undergoing the consultation phase and is also expected to be passed into legislation in 2011. The new marine licensing system is described as being very similar to the current FEPA system, however it is expected to allow greater flexibility in licensing terms and will have a wider range of sanctioning and enforcement options.

The construction and operation of the brine outfall will require a license from the Northern Ireland Environment Agency and it is most likely that the timescale of the project will result in the application for marine licensing to be made in 2011 under the new system, as currently a FEPA licence may not be applied for until a contractor has been appointed.

1.6.3.2 The Crown Estate

The Crown Estate plays an important part in the development of the UK's energy industry as owner of the UK seabed out to the 12 nautical miles territorial sea limit, with rights under the Energy Act 2004 in the Renewable Energy Zone (REZ) on the UK's continental shelf out to 200 nautical miles. From 6 April 2009 the Crown Estate obtained further rights under the Energy Act 2008 to award leases for the use of these offshore areas for natural gas storage and the unloading of liquefied natural gas (LNG). The Act enabled the UK to exercise its rights under UNCLOS beyond the territorial sea and extended up to 200 nautical miles with the creation of a Gas Importation and Storage Zone (GISZ).

As owners of the sub-surface beneath Larne Lough, consent from the Crown Estate Commissioners as landowners will be required for this proposal and a lease arrangement made with Islandmagee Storage Limited.

1.6.3.3 Waste Disposal Legislation

European Union (EU) Policy provides the overarching framework for the management of all wastes within Northern Ireland. It is essential that the wastes created from the gas storage project are treated and disposed of in the appropriate manner, without compromising either human or animal health or posing a threat to the wider environment. It should be noted that there are currently no landfill facilities in Northern Ireland which are capable of accepting any waste considered, under the Landfill Directive classifications, to be hazardous in nature.

There are a number of items of waste legislation which may be relevant to the proposed scheme. These are listed below and will need to be examined fully within the EIS.

- Waste Framework Directive (75/442/EC)
- Waste and Contaminated Land (Northern Ireland) Order 1997
- The Controlled Waste (Duty of Care) Regulations, 2003
- The Controlled Waste (Registration of Carriers and Seizure of Vehicles) Regulations (Northern Ireland), 1999
- Waste Management Licensing Regulations (Northern Ireland) 2003
- Pollution, Prevention and Control Regulations (Northern Ireland), 2003
- Transfrontier Shipment of Waste Regulations, 1994
- Hazardous Waste Regulations (Northern Ireland), 2005
- Waste Management (Northern Ireland) Regulations, 2006

1.6.3.4 Hazardous Substances

The *Planning (Hazardous Substances) (Amendment) Regulations (Northern Ireland) 2005* require that establishments wishing to hold stock of hazardous substances above a threshold quantity must apply to the Hazardous Substances Authority (HSA) for Hazardous Substance Consent. In Northern Ireland this is the DoE Planning Service (Special Studies Unit).

In accordance with statutory requirements, and in particular the requirements of the Pipelines Safety Regulations 1996, a Major Accident Prevention Document (MAPD) will be prepared and submitted to the HSE(NI), for information. This document will evolve during the design life of the pipeline and will form the basis of communication between the pipeline operator and HSE(NI). In addition to the MAPD, a Safety Case will be prepared prior to pipeline commissioning, detailing the safety management of the pipeline system.

1.6.3.5 Gas Order

Under Article 8(1)(b) of The Gas (Northern Ireland) Order 1996, a gas storage licence is required in order to store gas in a gas storage facility in Northern Ireland. This is a key principle of the regulatory framework in Northern Ireland. The licence may be granted by the Department of Enterprise, Trade and Investment or by the Utility Regulator under either general authority or consent from the Department.

As part of the planning application, consent will be also sought from the Department of Enterprise, Trade and Investment for this scheme.

1.7 Scope and Format of the EIS

1.7.1 Scope of EIS

Prior to work commencing on an EIS, it is important that the scope is effectively defined. The scoping exercise confirms the nature of the development, the breadth of the environmental assessment, the range of key issues and the extent to which each environmental issue needs to be addressed.

A scoping exercise was carried out at the outset of this project to determine the issues that needed to be addressed in the EIS. The scoping exercise involved the following main elements:

- Preliminary site visits to assess the likely environmental impacts at first hand,
- Preliminary consultation with the principal statutory and non-statutory consultees,
- Public and private consultation sessions,
- A desktop study where information about the site from a number of sources was examined.

The Planning Service of Northern Ireland has published a document to assist in the carrying out of Environmental Impact Assessments: *“Development Control Advice Note (revised) 10; Environmental Impact Assessment”* (1999).

This Guide is intended primarily for developers and their advisers who propose projects which, under the EIA regulations, require an Environmental Assessment. The main aims of this advice note are;

- To outline and provide advice on the Planning (Environmental Impact Assessment) Regulations (NI), 1999;
- To provide guidelines on the content of Environmental Statements;
- Explain the procedures involved in the publication, consultation and consideration of Environmental Statements;
- Explain the role and the responsibilities of the consultees.

The Advice Note highlights that the EIA process is a method of ensuring that the likely effects of new development on the environment are fully understood and taken into account before planning permission is given for the development to proceed. Its primary purpose is to improve the quality of decision making by identifying potential environmental issues early in the project process.

This Environmental Statement has been prepared with due consideration of this Advice Note published by the Planning Service after the amended EIA regulations were published in March 1999.

- The key strategic objectives and aims of the policy documents are summarised as follows.

- To protect and enhance the natural and man-made environment;
- To meet the future development needs of the community;
- To facilitate regeneration of the economy;
- To accommodate change, while maintaining the character of the countryside;
- To promote a high quality of design in new development;
- To pursue conditions and standards which will be beneficial not only to specific areas but to Northern Ireland as a whole;
- To provide a framework of land use proposals and policies which will enable continued development in an efficient, economic and orderly fashion aimed at achieving a high standard of urban physical environment whilst protecting natural resources and the innate quality of the area;
- To ensure that nature conservation policies contribute to conservation of the abundance and diversity of the UK wildlife and its habitats;
- To minimise the adverse effects on wildlife, where conflict of interest is unavoidable;
- To meet international responsibilities and obligations for nature conservation.

The introduction of a natural gas storage facility to Northern Ireland in Islandmagee will add a positive contribution of fulfilling the strategic objectives and aims of the aforementioned policy documents in a manner consistent with present and environmental planning policies.

A summary of the potential impacts identified during the scoping exercise is presented in Table 1.1 at the end of this Chapter.

Once the key issues were identified, baseline studies/surveys were carried out. The studies enabled the prediction of the likely environmental impacts arising from the proposed development. These impacts were then evaluated in terms of their significance and their nature and magnitude.

A fundamental aim of the environmental assessment, as part of the design process, is to ensure that any potentially damaging effects are avoided or minimised and that the beneficial aspects of the project are enhanced. The most satisfactory means of impact mitigation is to avoid it at the source either by site selection or as in this case, where possible, by redesign. Reduction involves lessening the degree of an impact which cannot be entirely avoided. Reduction acknowledges that some degree of adverse impact will arise, but provides means by which the conditions can be improved or compensated for.

Although the scoping exercise was carried out at the beginning of the Environmental Impact Assessment, the scoping continued throughout the project and in particular during the main consultation phase as outlined in **Chapter 2** of the EIS.

1.7.2 Format of the EIS

The Northern Ireland Environmental Protection Agency (NIEA) has produced guidelines for the production of an EIS in line with the Environmental Impact Assessment Regulations. These guidelines have been adhered to in the production of this report. It has been structured in what is termed a Grouped Format Structure, which examines each topic as a

separate section referring to the existing environment, the proposed development, impacts and mitigation measures. This EIS is divided into four main parts as presented in Figure 1.13.

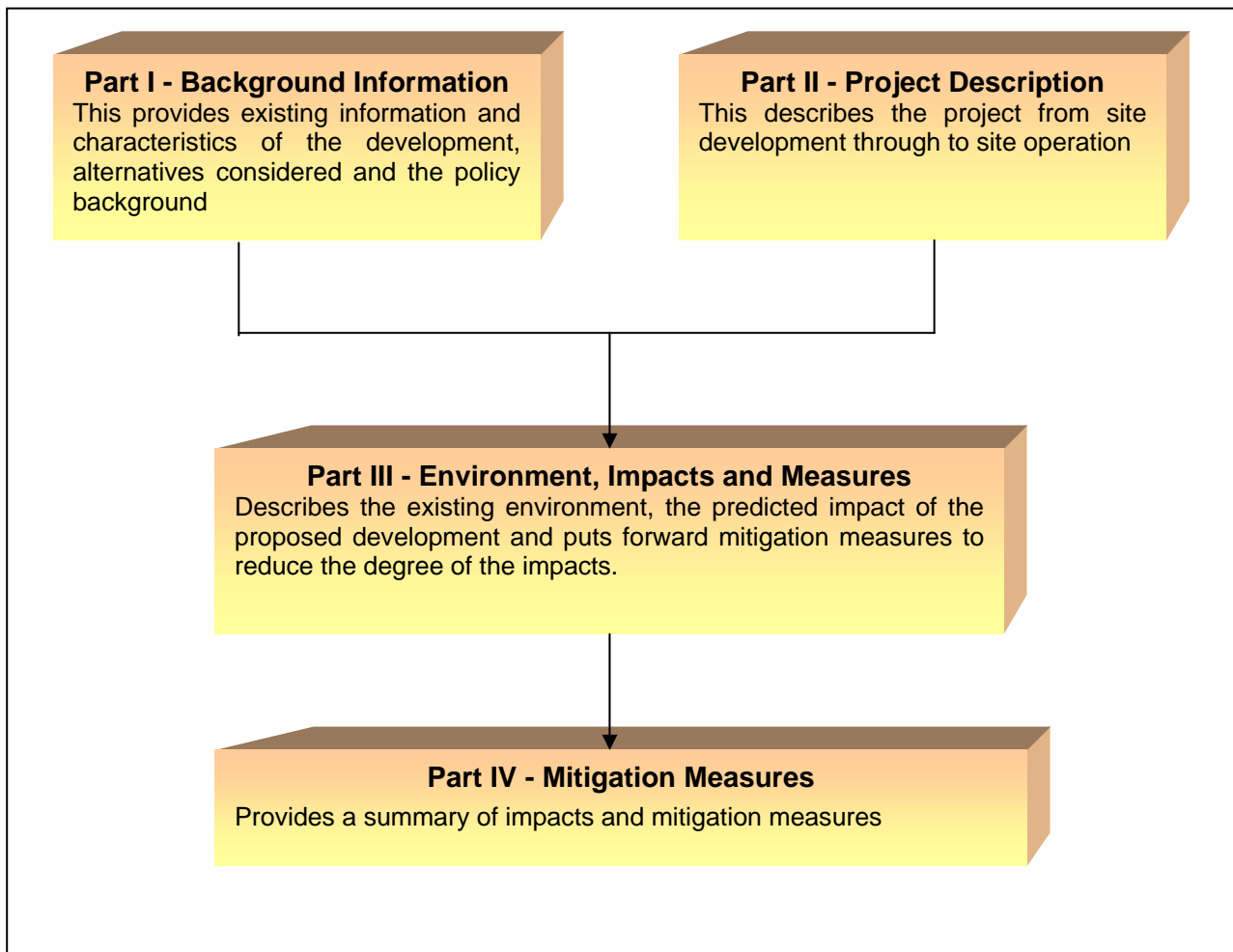


Figure 1.13 Format of the Environmental Impact Statement

1.7.3 Scoping Matrix

A scoping matrix was compiled to identify the potential impacts of the development during both the construction and the operational phases of the project against the topics listed in the EU directive and EIA regulations. The scoping matrix is presented in Table 1.1.

Table 1.1 Scoping Matrix

FISHERIES				
Environmental Topic (Ref: EIA regulations)	Construction Phase		Operational Phase	
	Degree of Potential Impact	Description	Degree of Potential Impact	Description
FLORA AND FAUNA				
Flora (Terrestrial and Marine)	-	<ul style="list-style-type: none"> Permanent loss of habitats beneath footprint of above-ground facilities. Temporary disturbance to habitats along brine pipeline routes. 	0 to +	<ul style="list-style-type: none"> Potential for new habitats to be created on sea bed
Fauna (Birds)	-	<ul style="list-style-type: none"> Disturbance of feeding and roosting areas for terrestrial birds. Potential for brine impact on feeding areas for seabirds 	0	<ul style="list-style-type: none"> No impact
Fauna (Marine Mammals)	-	<ul style="list-style-type: none"> Potential for temporary disturbance during construction activities 	0	<ul style="list-style-type: none"> No impact
Fauna (Benthic and Littoral)	-	<ul style="list-style-type: none"> Loss of benthic habitat as a result of dredging Potential for impact from brine discharge on benthic fauna. 	0 to +	<ul style="list-style-type: none"> Potential for new habitats to be colonised on sea bed. Periodic maintenance activities or emergency voiding of caverns will result in temporary short term brine discharge (see construction).

Oyster, Lobster and Scallop Fisheries	-	<ul style="list-style-type: none"> • Temporary disturbance to fishing activities by outfall construction • Potential for turbidity caused by dredging for outfall pipeline • Potential impact of brine discharge on shellfish 	- to +	<ul style="list-style-type: none"> • Potential for new lobster habitats to be created on sea bed • Potential for outfall to cause snagging of scallop fishing nets • Periodic maintenance activities or emergency voiding of caverns will result in temporary short term brine discharge (see construction).
LANDSCAPE AND VISUAL IMPACT				
Landscape and Visual	-	<ul style="list-style-type: none"> • Visual impact of construction activity 	- to 0	<ul style="list-style-type: none"> • Buildings will be sympathetic to existing landscape character and can be successfully screened from views across the Lough by landscaping.
CULTURAL HERITAGE				
Terrestrial Archaeology	- to 0	<ul style="list-style-type: none"> • Potential for disturbance of previously unrecorded archaeology. Can be mitigated against by appropriate construction methodologies. 	0	<ul style="list-style-type: none"> • No impact
Marine Archaeology	0 to +	<ul style="list-style-type: none"> • Potential uncovering of previously unrecorded archaeological artefacts 	0	<ul style="list-style-type: none"> • No impact
MATERIAL ASSETS				
Traffic	- to 0	<ul style="list-style-type: none"> • There may be temporary traffic disturbances during construction 	0	<ul style="list-style-type: none"> • No impact

Water/Drainage	- to 0	<ul style="list-style-type: none"> Potential impact of fresh water requirements for wellhead construction and disposal of foul waste. 	- to 0	<ul style="list-style-type: none"> Increase in surface run-off and water quality, can be mitigated against with careful design.
HUMAN BEINGS				
Socio-Economic	+	<ul style="list-style-type: none"> Creation of employment through construction activities 	+	<ul style="list-style-type: none"> Economic benefits limited within local community but beneficial to economy on a regional scale
COASTAL PROCESSES				
Dredging	- to 0	<ul style="list-style-type: none"> Temporary sediment plume from dredging operations (if outfall is buried) may disturb fishing activities 	0	<ul style="list-style-type: none"> No impact
Brine Outfall	-	<ul style="list-style-type: none"> Discharge of supersaturated brine during construction phase. Potential negative impacts will be mitigated against. 	- to 0	<ul style="list-style-type: none"> Periodic maintenance activities or emergency voiding of caverns will result in temporary short term brine discharge (see construction).
NOISE/VIBRATION				
Noise	-	<ul style="list-style-type: none"> Noise during construction phase but not likely to exceed noise limits 	- to 0	<ul style="list-style-type: none"> Operational noise from compression equipment
Vibration	- to 0	<ul style="list-style-type: none"> Vibration may be an issue if blasting is needed during dredging or construction operations 	0	<ul style="list-style-type: none"> No impact
GEOLOGY AND HYDROGEOLOGY				

Geology	- to 0	<ul style="list-style-type: none"> Potential for slope failure of unstable overburden. 	0	<ul style="list-style-type: none"> No impact
Hydrogeology	- to 0	<ul style="list-style-type: none"> Potential for impact to aquifers during drilling activities. Potential for leaching of contaminants from power station spoil heap. 	0	<ul style="list-style-type: none"> No impact
HEALTH AND SAFETY				
Health and Safety	- to 0	<ul style="list-style-type: none"> Risk of explosion or fire due to proximity of works to high pressure gas and high voltage electricity infrastructure. 	0	<ul style="list-style-type: none"> No impact

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