

Water Supply Project
Eastern and Midlands Region

**Options Working
Paper (OWP)**
Non Technical
Summary

June 2015



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1.1 Options Working Paper (OWP) - Non Technical Summary

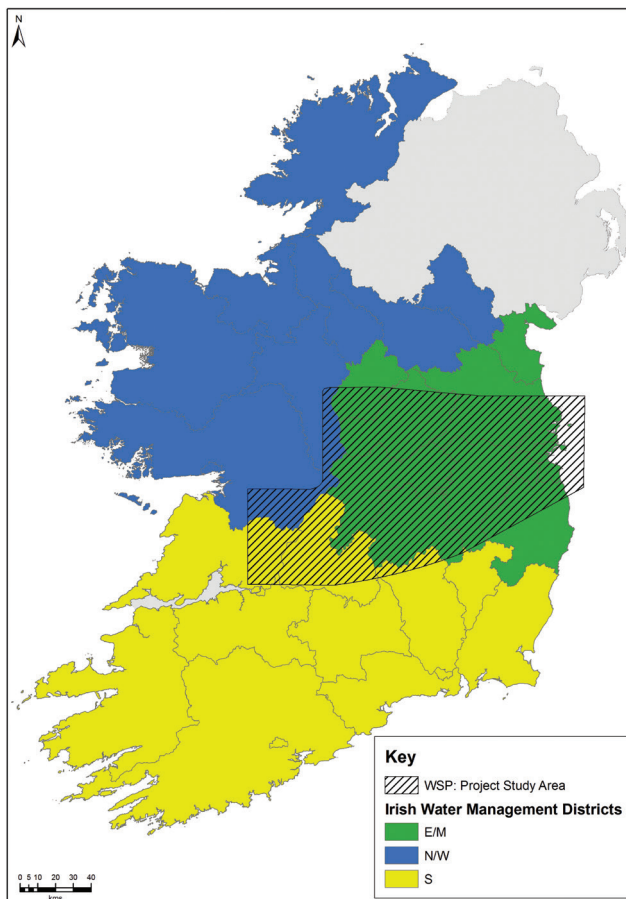
1.1 Introduction

On 1st January 2014, Irish Water assumed responsibility for managing Ireland's water and wastewater investment and maintenance programmes. On that date, Irish Water also took over the management of the Water Supply Project Eastern and Midlands Region (WSP) from Dublin City Council / Department of Environment, Community and Local Government. The project is currently in the project planning stage.

Management of the planning stage of the project is currently focused on achieving a planning submission to An Bord Pleanála by mid-2017 with a view to delivering an additional source of water throughout the Eastern and Midlands Region by 2022.

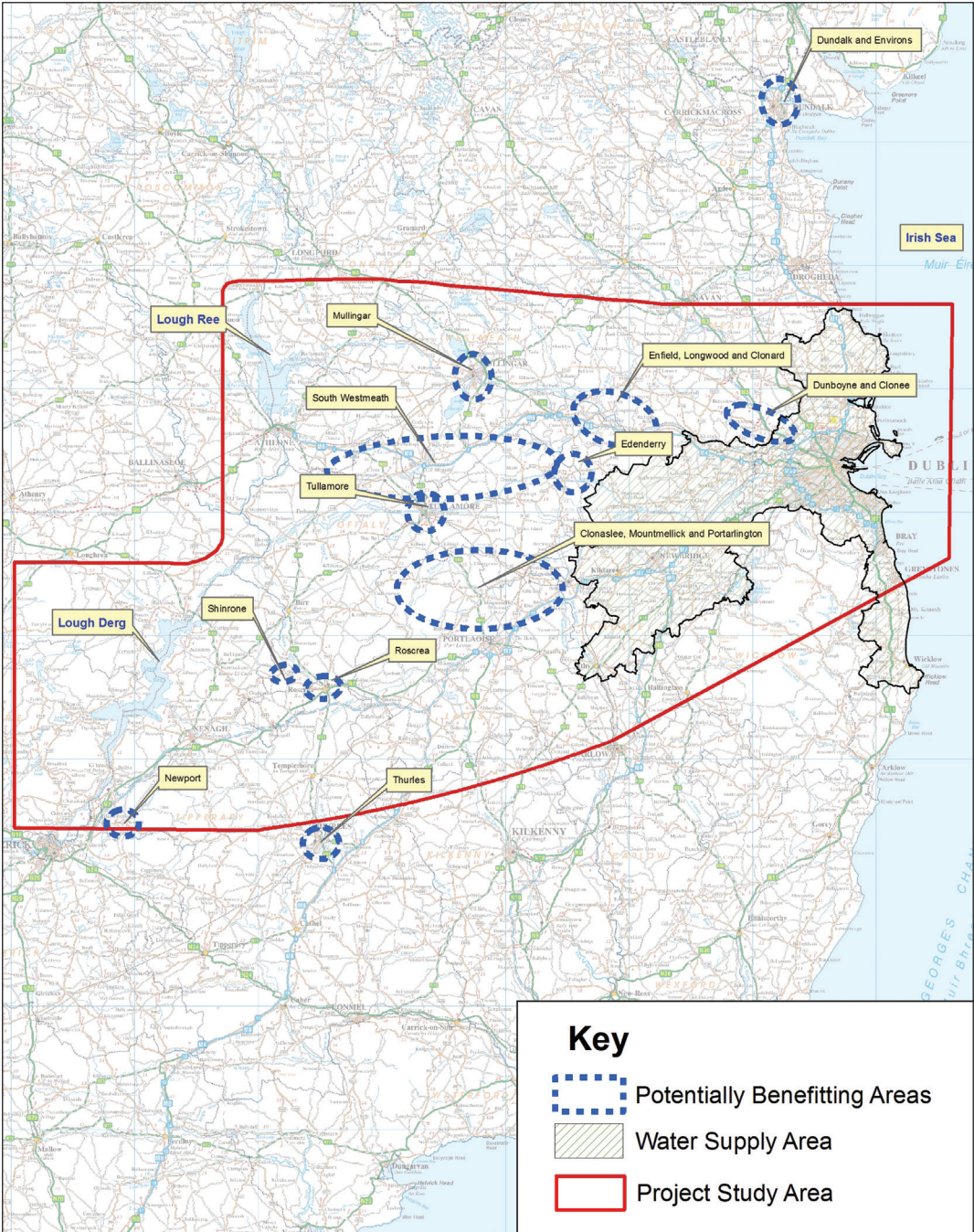
When responsibility for the project was with Dublin City Council, the project was known as the 'Water Supply Project – Dublin Region' as the principal focus was planning for future water supply needs of the East / Dublin Region up to 2050 and beyond. However, the transfer of water services functions to Irish Water has opened a unique opportunity to take a strategic view of providing water services at a national level and as a result the project has now been referenced to the three regions within which Irish Water operates (see Figure 1.1). Since the bulk of water supplies from the project will be delivered to the East & Midlands, the project is now known as the 'Water Supply Project Eastern and Midlands Region (WSP)'.

Figure 1.1 Irish Water Regions and Study Area



The transfer of responsibility for managing the project from Dublin City Council to Irish Water has also resulted in an increased focus on potential 'Benefiting Corridors' which will be created by the water transfer pipelines between potential new water source options and the terminal delivery point (see Figure 1.2). This is because Irish Water has responsibility for ensuring secure, resilient and high quality water supplies in all locations of Ireland and not just in the East of Ireland. A 'Benefiting Corridor' between a River Shannon-based source and Dublin is greater than, for example, an Irish Sea source in the case of a Desalination option. The increased emphasis on maximising benefits in a 'Benefiting Corridor', when taken into consideration with other assessment criteria, may potentially favour options with water treatment at source since treated water can then be made available to the widest possible areas / communities within the general vicinity of the water pipeline route corridor.

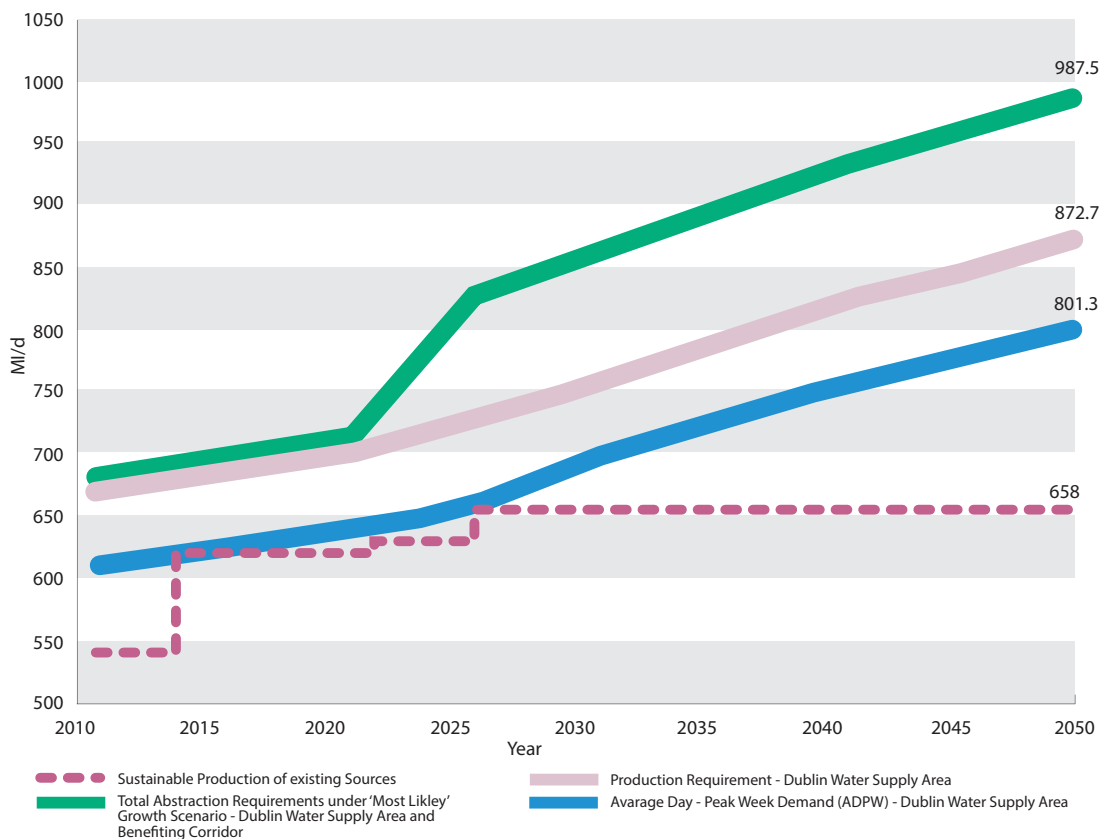
Figure 1.2 Study Area - Water Supply Project Eastern and Midlands Region



1.2 Need for Project (Project Need Report)

On 10 March 2015, Irish Water published the Project Need Report which identified the need for the project in a national context. It included assessments of projected population and industrial growth (2014-2050) and savings expected from water conservation and leakage management. It included support for regional development to ensure that national benefits are meaningfully shared and given local effect. The 'Project Need Report' identified a total requirement of 330 million litres per day (Mld) by 2050 (215 Mld for the Dublin Water Supply Area, 99 Mld for a potential 'Benefiting Corridor' and 16 Mld used in the treatment process itself). The Project Need Report identified that availability of a 330 Mld new source of supply for the Eastern and Midlands Region will ensure sufficient water to avoid costly interruptions in water supply and also ensure sufficient security of supply, making Ireland an attractive location for expansion of existing enterprises and for inward investment from water intensive industries particularly in the ICT, Bio-Pharma and Agri Food sectors. See Figure 1.3 for graphical representation of Demand Projections / Project Need.

Figure 1.3: Water Demand Projections (Project Need Report)



1.3 Public Consultation – (Where we are now)

Public consultation on the 'Project Need Report' was undertaken during the period 10th March – 5th May 2015. That marked the first in a series of public consultations which will take place at different stages in the planning process over the 2015-2017 period (see Planning Process Roadmap at the end of this Non Technical Summary).

The current Public Consultation (June – August 2015) on the Options Working Paper (OWP) is the second consultation in the planned series of public consultations. The prime focus of this consultation is to receive feedback from the public in relation to a) the proposed constraints and b) the assessment criteria which will be used to select a preferred new water supply option. The constraints apply particularly to location of water infrastructure (e.g. water abstraction equipment, water treatment plant and pipelines / pumps for transporting water). The assessment criteria will specifically be used to assess options relative to each other and will include technical, risk, environmental, economic and socio-economic criteria.

This current OWP consultation revisits the ten options that were examined during the Strategic Environmental Assessment (SEA) over the 2007 – 2011 period and outlines how the current Environmental Impact Assessment (EIA) and Planning Phase proposes to progress from the SEA phase through to the submission of a planning application to An Bord Pleanála in mid-2017.

It is important to note that no decisions have been made at this stage in relation to a new supply option for meeting the project need. Decision-making in relation to a new preferred water supply option requires a combination of:

- Feedback from consultation and
- Availability of appropriate support data

It is intended that an 'Emerging Preferred Option' will be identified in the latter part of 2015 following feedback from public consultations and with the support of appropriate data from on the ground fieldwork and investigation surveys currently underway. The 'Emerging Preferred Option' will be published for consultation in the Preliminary Options Appraisal Report (see Planning Process Roadmap at the end of this Non Technical Summary).

This round of public consultation is asking the public for their opinion on:

- What other national, regional or locally important constraints should Irish Water take into account when locating the infrastructure associated with each water supply option?
- Have you any comment on the proposed constraints and the approach to their use?
- Are there any assessment criteria other than those proposed which should be used in the next phase of options appraisal?
- How would you like to be communicated with as the project progresses?

1.4 The original SEA process and SEA Statement (2011)

During the Strategic Environmental Assessment (SEA) process carried out by Dublin City Council (DCC) and their Service Providers over the 2007-2011 period, ten options (one of which had two sub-options) for a new source of water supply, were appraised at a high, desktop-study level, on limited data which was available at that time. The options were appraised by Multiple Criteria Analysis (MCA), an approach which allows all of the key assessment criteria to be considered collectively. The key assessment criteria include technical, risk, environmental, socio-economic and economic assessment criteria.

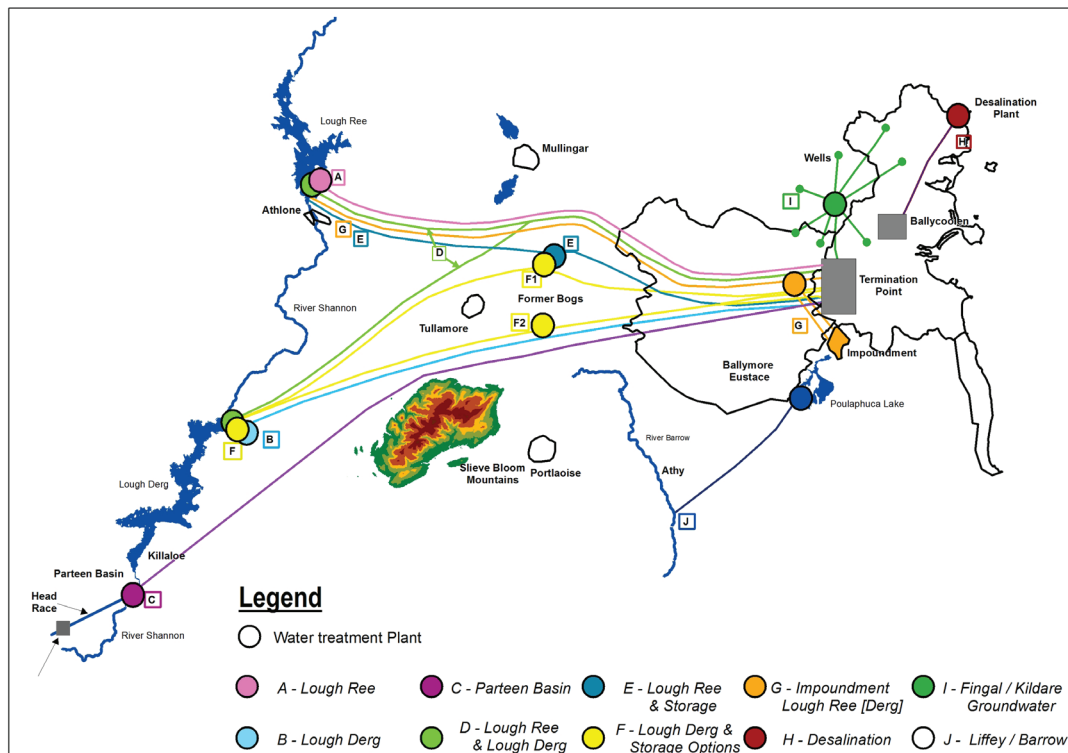
The options assessed during the SEA had different challenges and degrees of merit and an 'SEA recommended' option (primarily for meeting the Eastern Region Needs) was provisionally identified, involving abstraction from Lough Derg combined with a proposed raw water storage and water treatment facility at Garryhinch in the Midlands.

However, the SEA fully recognised that this 'SEA Recommendation' was indeed only provisional and that data from investigative studies, such as water quality modelling and subsoil surveys, would be required at Environmental Impact Assessment (EIA) and Planning Phase to assess existing conditions in Lough Derg / Parteen Basin and at a potential raw water storage site at Garryhinch Bog in sufficient detail before this option could be considered as an Emerging Preferred Option for planning purposes. That investigative work, combined with surveys and data modelling, is now underway during this Environmental Impact Assessment (EIA) and Project Planning Phase.

The ten Options (and sub-options) assessed in the SEA process (2007-2011) and published by DCC in the SEA Statement of 2011 are outlined on Figure 1.4. These are:-

- Option A – Lough Ree (Direct)
- Option B – Lough Derg (Direct)
- Option C – Parteen Basin (Direct)
- Option D – Lough Ree and Lough Derg
- Option E – Lough Ree and Storage
- Option F – Lough Derg and Storage
 - Option F1 – Lough Derg and Storage (Rochfortbridge)
 - Option F2 – Lough Derg and Storage (Garryhinch)
- Option G – Lough Ree with Impoundment
- Option H – Desalination
- Option I – Groundwater
- Option J – Conjunctive use of the River Barrow and River Liffey

Figure 1.4: Ten Options (Assessed in SEA Process)



In that 2011 SEA Statement, the ten options were assessed on Criteria covering:

- (a) Technical attributes of the Water Supply Source
- (b) Technical attributes of the required Abstraction / Treatment and Pipeline Infrastructure
- (c) Environmental impacts assessed under SEA
- (d) Habitats Directive Assessments (HDA)
- (e) Economics
- (f) Socio-Economic impacts

After assessing these options using the criteria (a to f) above, the top ranked technically viable options (four in total) that emerged from the 2007-2011 SEA were as follows:-

- (i) Option F2 (North East Lough Derg with Storage)
- (ii) Option B (North East Lough Derg Direct)
- (iii) Option C (Parteen Basin Direct)
- (iv) Option H (Desalination)

In parallel with considering each of the ten Options under the Multi Criteria Assessment as above, Dublin City Council and their Service Providers also carried out a separate Risk Appraisal process on the options. The same top four options emerged from the risk assessments but the ranking changed as follows:-

- (i) Option F2 (North East Lough Derg with Storage)
- (ii) Option C (Parteen Basin Direct)
- (iii) Option B (North East Lough Derg Direct)
- (iv) Option H (Desalination)

1.5 Irish Water Review (2014 – 2015) of the Previous (2007-2011) SEA Process and Options

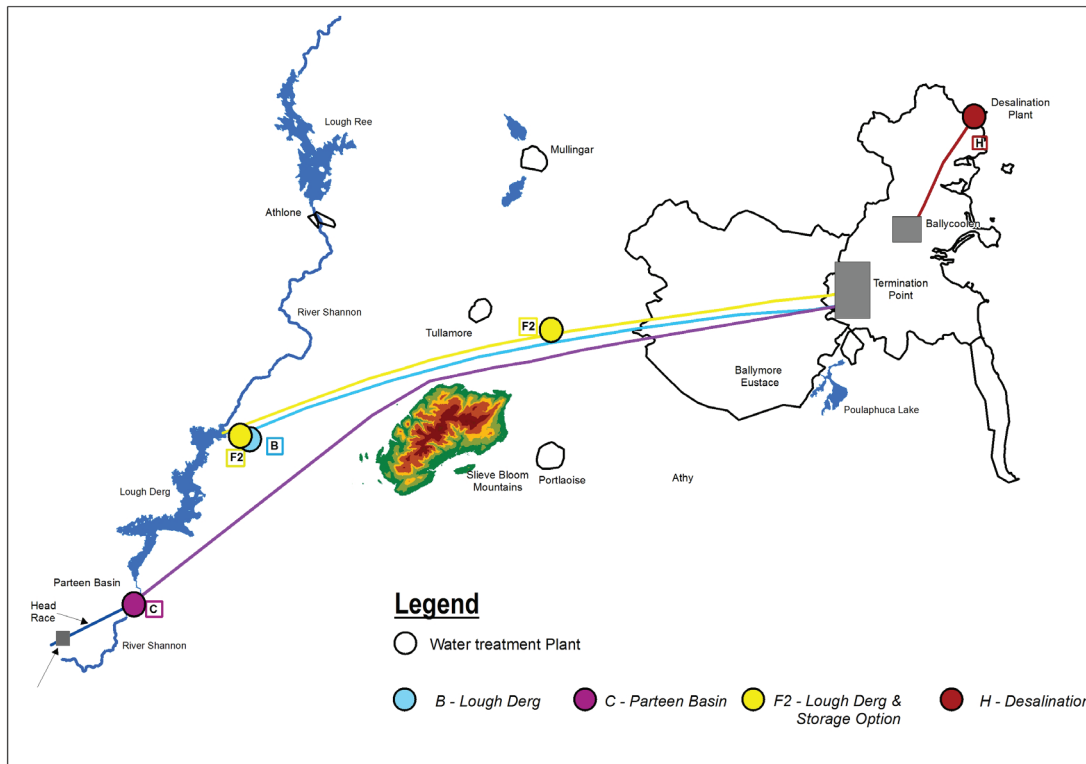
Over the 2014-2015 period, Irish Water and their Service Providers have updated and reviewed the 2007-2011 SEA process and Options, and the findings of these updates / reviews are now being reported on by Irish Water in the Options Working Paper which has just been published (9 June 2015) for public consultation. The Irish Water updating and reviews involved further examinations - these included:

- A desktop review of the ten SEA options appraisal process, taking cognisance of developments in the intervening period (2011-2015), to re-confirm those options previously considered by the SEA as top ranked technically viable alternatives, numbering four in total. (Note: The principal developments over the 2011-2015 period include changes to groundwater legislation and changes in legislative requirements and interpretations of environmental directives; Environmental Impact Assessment (EIA), Habitats Directive Assessment (HDA), Water Framework Directive (WFD) and the Floods Directive (CFRAMS))
- Re-examining the ten SEA options along with stakeholder feedback previously received during public consultations (2007 – 2011) and subsequently up to the present time (2011 – 2015)
- Assessing each of the ten options for their ability to supply the quantity of water needed without impacting negatively on the water source or on the environment
- Assessment of each of the proposed water abstractions for compliance with the requirements of the Habitats Directive

Following Irish Water's review of the ten options previously considered, the review validated the four top ranked technically viable options previously identified and confirmed that they still remain appropriate to be brought forward for further consideration (during the EIA & Planning Process). The four options (see Figure 1.5), with their identifying labels in the SEA, listed in no particular order of priority, are as follows:

- DESALINATION - Option H
- LOUGH DERG (DIRECT) – Option B
- LOUGH DERG AND STORAGE – Option F
- PARTEEN BASIN (DIRECT) – Option C

Figure 1.5: Four Technically Viable Options (Now Being Assessed by EIA)



The Irish Water review also identified the following:

- Option J (Barrow-Liffey Conjunctive use) is unable to sustainably provide the projected water supply requirements of the Water Supply Area
- Option I (Groundwater) is unable to sustainably provide the projected water supply requirements of the Water Supply Area. Groundwater within a region of 80 km in radius, centred on Dublin, was assessed at the time of preparation of the SEA in 2008 and it was concluded that groundwater on its own would not be able to supply the projected demand, and that the best use of this limited groundwater resource would be in a ‘supplementary’ capacity. Since that work was completed, the definition of ‘available groundwater resource’ now included in the Groundwater Regulations (2010) introduces a complex linkage with the Water Framework Directive – this is discussed in detail in the OWP. The conclusion drawn in 2008, that groundwater has a potential role, as a proven, sustainable supplementary source, capable of augmenting a primary supply from an alternative source, has been identified by the Irish Water review as correct, and places groundwater in its proper context, in time and scale.
- Options A, D, E, and G (all sourcing water from Lough Ree) are unable to sustainably provide the projected water supply requirements of the Water Supply Area whilst remaining in compliance with ESB requirements as set out in ‘The Regulations and Guidelines for the Control of the River Shannon’. Achieving consensus with stakeholders and environmental authorities with respect to water levels & water flows and ensuring minimisation of low flow durations through the Shannon callsows downstream of Lough Ree, is not achievable with a water abstraction from Lough Ree.

- In addition, Options A, D, E, and G cannot be used for water supply as they do not comply with the Habitats Directive. This is legislation which applies the precautionary principle (in favour of exclusion) when there is uncertainty in relation to potential environmental impacts on European designated sites (e.g. Special Areas of Conservation).

The identification of Options B, C, F2 and H as reasonable water supply options for consideration during the current EIA & Planning Process validates the Multi Criteria Analysis and the Strategic Environmental Assessment processes applied previously under the SEA and HDA work (2007-2011). It also validates the four top ranked options previously identified in the Adopted Plan / SEA Statement published in 2011.

Given the conditional nature of the SEA ‘recommended option’ from the previous study it has been decided by Irish Water not to consider any option as an SEA ‘recommended option’ at this point in the current process.

The 2007-2011 SEA and the review by Irish Water 2014 – 2015 recommends that the four options for the Water Supply Project Eastern & Midlands Region which are to be taken forward for further consideration are;

DESALINATION (OPTION H):

Abstraction of sea water from the Irish Sea in north Fingal – this option involves intake and desalination of sea water through a Reverse Osmosis (RO) desalination plant, discharge of brine (from the treatment process) back into the Irish Sea, pumping of treated water through 25km of pipelines which would facilitate serving communities en route and finally delivering treated water to existing and proposed reservoirs located in northern and western parts of Dublin.

LOUGH DERG DIRECT (OPTION B)

A constant abstraction design concept – this option involves abstraction and treatment on the north eastern shore of Lough Derg, followed by 122km of treated water transfer pipelines, in a configuration which could supply treated water to other communities en route.

LOUGH DERG AND STORAGE (OPTION F2):

This would have the same design concept as the Lough Derg (Direct) option, but involving variable abstraction, in this case, on the north eastern shore of Lough Derg in combination with storage of raw water at Garryhinch in the Midlands. The storage facility would accommodate up to 2 months average water supply requirements (for Dublin). This option could supply treated water to other communities en route from Garryhinch to Dublin.

PARTEEN BASIN DIRECT (OPTION C):

This would have the same design concept as for Lough Derg (Direct) but involves a longer distance of 158km for treated water transfer pipelines. This option could supply treated water to other communities en route from Parteen Basin to Dublin.

The options which did not meet the requirements of either the Habitats Directive or the water supply Need, or both were:

Conjunctive use of the River Barrow:

This would involve abstractions of water from the River Barrow when sustainable quantities may be available during winter and spring and combining these with variable abstractions from Pollaphuca.

Groundwater:

Abstraction of water from groundwater sources within an 80km radius of Dublin.

Lough Ree (Direct):

A constant abstraction design concept similar to the Lough Derg (Direct) option

Lough Ree and Lough Derg combined:

A hybrid design concept, drawing from both lake sources in a phased development, with an anticipated 10 years separation between the phases.

Lough Ree and Storage:

Similar to the Lough Derg with Storage option but with the storage provided at a cutaway bog site near Rochfortbridge.

Lough Ree with Impoundment:

Similar to Lough Ree Storage but with the raw water being impounded in a valley in the Dublin / Wicklow Mountains prior to treatment.

1.6 Appraisal of the four Technically Viable Options - Constraints

The WSP project team are now looking in detail at the four technically viable options in terms of the constraints or limiting factors which apply to them.

A 'constraint' is any limiting factor on site selection for infrastructure. It can be related to human settlements, or environmental, or technical factors. Good design would position infrastructure to try to avoid constraints from the outset.

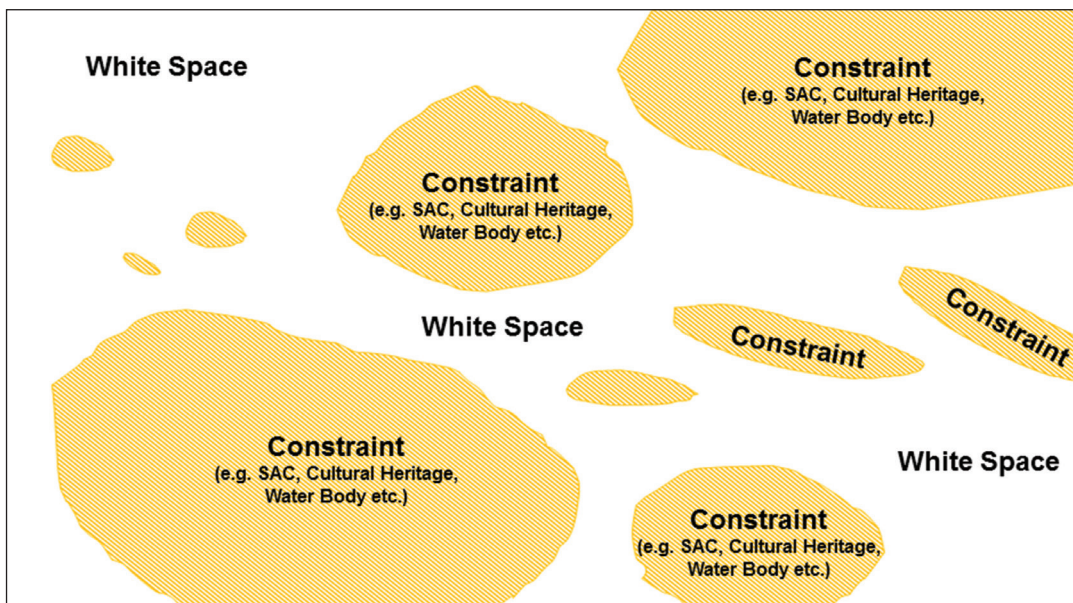
These constraints include a wide range of people and environment related limiting factors. The selection of the location for infrastructure sites (e.g. treatment plants) and the routes for pipelines is therefore approached primarily through avoidance of impacts, by avoiding constraints, wherever possible. The methodology will involve putting the constraints on a map with a view to optimising the siting of the various option elements (location of pumping and treatment sites, the routes for pipelines etc). Figure 1.6 shows typical constraints located on a map resulting in the identification of available white space for the possible location of water supply infrastructure.

The mapping facilitates the identification of areas which should be avoided where possible and where it is not possible to avoid some areas, to minimise potential adverse impacts through design measures. Mapping of constrained areas will be undertaken within the study area, under the following headings:

- Ecology
- Archaeology, Cultural Heritage and Architectural Heritage
- Soils, Geology and Hydrogeology
- Water Quality
- Landscape and Visual
- Population and Infrastructure

(For more information on constraints please refer to the OWP).

Figure 1.6: Mapping Constraints and Identifying ‘White Space’



As part of this public consultation, Irish Water is now asking whether there are any other constraints that need to be considered over and above the ones proposed by Irish Water in the OWP.

1.7 Appraisal of the Four Technically Viable Options – Assessment Criteria

In addition to constraints, the Options Working Paper also sets out the assessment criteria which will be used in further Options Appraisals (relative to each other). As part of a Planning Application, it is necessary to prepare an Environmental Impact Assessment (EIA) and Appropriate Assessment (AA) on a preferred option, where the reasonable alternatives considered are also presented.

The preferred option will emerge from the four options already identified: B, C, F2 and H.

The Options Appraisal methodology will rely on a relative assessment of the ‘people related’ and ‘environment related’ impacts to identify an Emerging Preferred Option from the four currently identified technically viable options.

The ‘people related’ and environmental assessment criteria which will be applicable to the EIA assessments are as follows:

- Biodiversity, Flora and Fauna
- Fisheries
- Water
- Air/Climatic Factors
- Material Assets (Energy)
- Cultural Heritage (including Architecture & Archaeology)
- Landscape & Visual
- Material Assets (Land use)
- Tourism
- Population
- Human Health
- Soils, Geology and Hydrogeology

The technical and risk criteria which will be applicable to the EIA assessments are as follows:

- Safety
- Planning Policy
- Engineering and Design
- Capital and Operating Costs
- Sustainability
- Risk

Each option will be assessed by relevant technical and environmental specialists under each of these criteria outlined above. These assessments will be used to identify the differentiating sub-criteria that will distinguish the emerging preferred option.

With each option individually defined by abstraction location, transmission pipeline route, storage (where applicable) and terminal reservoir infrastructure, option appraisal will rely on assessment of all these elements outlined above.

1.8 Public Consultation

On March 10th, 2015, Irish Water commenced public consultation on the need for the project, with publication of the Project Need Report, and the Roadmap of the consultation process up to submission of a Planning Application. The submissions and communications received have been taken into account and are summarised in the Appendices to the Options Working Paper.

Public participation and consultation forms a key part of the decision making process being undertaken by Irish Water for this next phase of the project. Irish Water would like your feedback on the constraints and assessment criteria that will be used to examine the options outlined above, in order that your feedback can be considered, where relevant, in the next phase of the project. Irish Water is running a public consultation process that begins on 9th June 2015 and will conclude on the 4th August 2015

Everyone is welcome to give their views and all submissions and feedback from the public will be reviewed and considered by the Project Team in the next stage of the process. The Options Working Paper is now offered for Public Consultation, on the following questions:-

- What other national, regional or locally important constraints should Irish Water take into account when locating the infrastructure associated with each water supply option?
- Have you any comment on the proposed constraints and the approach to their use?
- Are there any assessment criteria other than those proposed which should be used in the next phase of options appraisal?
- How would you like to be communicated with as the project progresses?

Your submissions from this consultation will be analysed on an issue by issue basis. All relevant issues raised from this consultation will be reviewed, reported on and published as part of the next consultation – the Preliminary Options Appraisal Report (detailing an Emerging Preferred Option) due in the latter part of 2015. Any relevant constraints or criteria identified by the consultation process will be taken into consideration in the process. It is intended that a Preferred Option will be submitted to An Bord Pleanála for planning approval in 2017 with a view to delivering water throughout the Eastern and Midlands Region by 2022.

The Water Supply Options Working Paper is available to view in County Libraries and at Planning Counters within the project study area and can be downloaded from: www.watersupplyproject.ie. Further information can also be obtained by calling 1890 252 848 or emailing: watersupply@water.ie.

Submissions to the consultation process can be sent either by email to watersupply@water.ie or by post to Water Supply Project, Merrion House, Merrion Road, Dublin 4. Closing date for submissions is 4th August 2015.

PROJECT ROAD MAP WSP* CONSULTATION

