WATER SUPPLY PROJECT
DUBLIN REGION

Dublin City
Baile Átha Cliath

NON-TECHNICAL SUMMARY

Water Supply Project - Dublin Region

RPS

VEOLIA WATER

July 2010

MDW0158RP0109

WATER SUPPLY PROJECT
DUBLIN REGION

Dublin City
Baile Átha Cliath

www.watersupplyproject-dublinregion.ie.

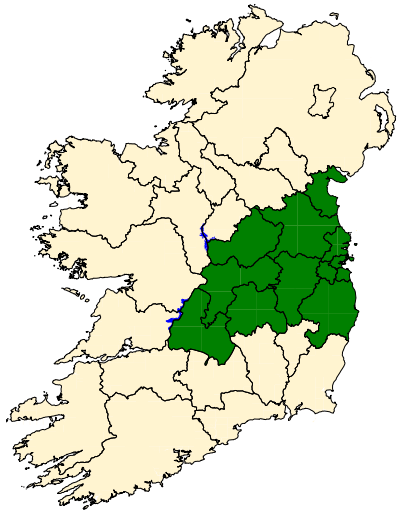
‘The first significant public water supply to Dublin and Wicklow was the Vartry scheme constructed in the 1860s by the then Dublin Corporation (now Dublin City Council (DCC)) and remains in service over 130 years later.’

HISTORICAL FACT

During the 1940s, the Electricity Supply Board , in conjunction with Dublin Corporation (now DCC), developed a joint venture scheme to provide dams at Poulaphuca and Leixlip on the River Liffey, which impounded water for power generation and for public water supplies.

HISTORICAL FACT

As in the past, the Dublin Region is again approaching the stage where new long-term secure and sustainable supplies of water are critical to the next phase of its development, in order that it can continue to grow and contribute to the optimal economic performance of the state as a whole ….



CONTENTS

1. BACKGROUND

1.1. DUBLIN REGION (WATER SUPPLY AREA)

The Greater Dublin Area (GDA) is outlined in Figure 1.1. It includes the administrative areas of Dublin City, Dun Laoghaire-Rathdown, Fingal, South Dublin and all of Kildare, Meath and Wicklow.

The Dublin Region (Water Supply Area) includes the administrative areas of Dublin City, Dun Laoghaire-Rathdown, Fingal and South Dublin Counties, along with significant parts of Counties Wicklow, Meath and Kildare. Current population (2009) of the Dublin Region (Water Supply Area) is approx 1.5m people (approx 35% of Republic of Ireland's overall population). The Region is also home to several strategic industries of national importance (e.g. Diageo, Intel, Wyeth, etc.).

1.2 HISTORICAL CONTEXT

The first significant public water supply to Dublin and Wicklow was the Vartry scheme constructed in the 1860s by the then Dublin Corporation (now Dublin City Council (DCC)) and it remains in service over 130 years later. This scheme, with its source at Roundwood, includes a rock tunnel feeding twin trunk mains to the city and incorporates open storage reservoirs at Stillorgan. It replaced private water supplies, generally from groundwater sources. These had become polluted and were a major source of waterborne diseases which caused regular epidemics.

Also in the 19th century, the Dodder scheme at Bohernabreena was developed by Dublin City to supply the Rathgar/Pembroke area, with facilities for treatment at Ballyboden.

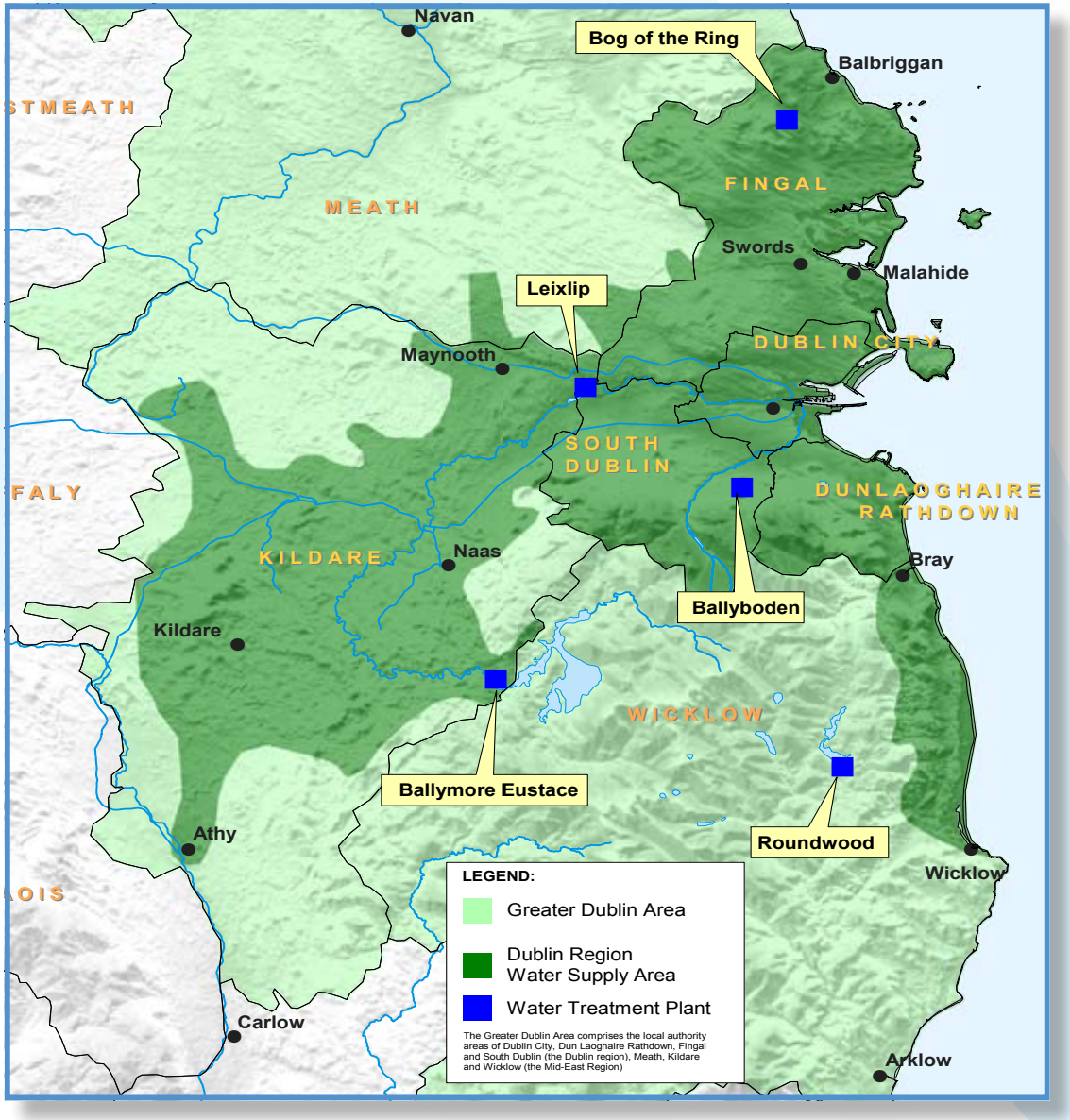
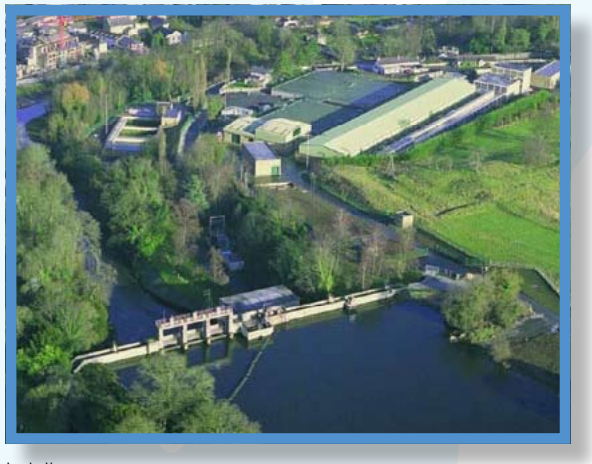


Figure 1.1
Greater Dublin Area / Dublin Region (Water Supply Area)

During the 1940s, the Electricity Supply Board (ESB – a commercial semi state organisation), in conjunction with Dublin Corporation (now DCC), developed a joint venture scheme to provide dams at Poulaphuca and Leixlip on the River Liffey, which impounded water for power generation and for public water supplies. Water treatment plants were built, initially at Ballymore Eustace, and later at Leixlip. These were further developed and expanded over time as supply needs grew.



Leixlip

Poulaphuca Reservoir

The Vartry and Liffey schemes (which were visionary in their day), developed for the benefit of the Region by Dublin City, ensured long-term secure supplies of high-quality water for Dublin. They enabled its economic development and growth for over a century. Both schemes required the construction of significant infrastructure to convey water to locations which in many instances were over 50km from source. For their day, they were major engineering and economic feats.

Ballymore Eustace Water Treatment Plant

Vartry Reservoir and Water Treatment Plant

As in the past, the Dublin Region is again approaching the stage where new long-term secure and sustainable supplies of water are critical to the next phase of its development, in order that it can continue to grow and contribute to the optimal performance of the state as a whole - economically, socially and environmentally - as envisaged in the National Spatial Strategy for balanced development which is a key component of the overall National Development Plan. Current demand projections, even allowing for impacts of the current economic slowdown (2008 – 2010), show that without a new major source of water, the development of the region is likely to be constrained from approx 2020 onwards. Delivery of a new source of adequate size within this 10 year timeframe will be challenging.

2 INTRODUCTION TO THE WATER SUPPLY PROJECT-DUBLIN REGION

2.1 LONGTERM WATER SUPPLY NEEDS OF THE DUBLIN REGION

The Greater Dublin Water Supply Strategic Study (GDWSSS) 1996 and subsequent review of the 1996 study in 2000 (Year 2000 Review) were prepared by the Department of Environment Heritage and Local Government (DEHLG) as a strategy for the development of drinking water in the Dublin Region for the 1996 – 2016 / 2020 period. The Assessment of Needs, adopted by DCC Councillors over the 2000-2002 period, included a requirement for studies to identify solutions for meeting future water shortages. This was accepted by DEHLG, who made provision in the 2002-2004 Water Services Investment Programme (WSIP) for these studies to be carried out and funded by DEHLG. Dublin City Council (DCC) were appointed by DEHLG in 2003 to;

1) Undertake a Feasibility Study
and
2) Prepare a Plan (Preliminary Report)

for the purpose of identifying and recommending a preferred new major supply source to meet the longterm water supply needs of the Dublin Region (Water Supply Area).

In carrying out the study, DCC act in a lead role on behalf of the seven Local Authorities in the Dublin Region (Water Supply Area) who receive their water supplies (in whole or in part) from the four existing sources and water treatment plants in the Region controlled and operated by DCC and / or Fingal County Council (see Table 2.1)

Table 2.1 Sources & Water Treatment Plants 2010

Source	Treatment Plant	Owner / Operator
Upper Liffey	Ballymore Eustace	Dublin City Council
Lower Liffey	Leixlip	Fingal County Council
Vartry	Roundwood	Dublin City Council
Dodder	Ballyboden	Dublin City Council
Bog of the Ring (Groundwater)	Site Locations (Balbriggan)	Fingal County Council
Kildare Well Fields (Groundwater)	Site Locations (Monasterevin)	Kildare County Council

2.2 PROCUREMENT OF CONSULTANTS

Following a competitive EU procurement process an experienced international joint venture (JV) consultancy organisation, RPS – Veolia JV, were appointed by DCC (2004) to undertake the Feasibility Study and Preliminary Report. The JV was led by RPS with Veolia providing specialist technical inputs particularly in relation to desalination technology which was one of the water supply options studied.

RPS is an international consultancy, with extensive experience of working in Ireland. RPS provides advice (inter alia) on:

- the development of water infrastructure
- management of the environment
- planning

RPS trades in Ireland, the UK, the Netherlands, the United States, Canada, Australia and South East Asia and also undertakes projects in many other parts of the world.

Veolia Wateris the Water Division of Veolia Environment, which is a world leader in the provision of environmental solutions in the water, waste management, energy optimisation and transportation fields. With annual revenues of €7.6bn and 68,000 employees worldwide, Veolia Water is the World leader in the water industry, providing water and/or wastewater services to over 110 million people.

2.3 OVER RIDING PURPOSE OF NON TECHNICAL SUMMARY

The over riding purpose of this non-technical summary is to provide an interim update to stakeholders regarding the current status of the 'Plan' for meeting the Region's long term water supplies. Previous stakeholder briefings were undertaken when a draft Plan (2008) was formally made available during the Strategic Environmental Assessment process (Nov 2008 – Feb 2009). Feedback from this (SEA) process has now been incorporated, as appropriate, into the latest update of the draft Plan (2010).

Because of the lengthy timescales involved, the (2010) draft Plan recommends that formal planning consent should be sought now for the development of a new sustainable source of drinking water for the Dublin Region in order to meet anticipated demand growth to 2040 and beyond. Following detailed consideration by DEHLG & all relevant Local Authorities, the final adopted Plan will be made available on the dedicated project website www.watersupplyproject-dublinregion.ie.

The Dublin Region, consisting of the four Dublin County Councils, Kildare, Northern Wicklow and a growing part of County Meath, is supplied with drinking water from one common water supply network. Into this network, four main water treatment plants provide the vast bulk of drinking water. Three of the main plants are operated by Dublin City Council and one is operated by Fingal County Council (see Table 2.1). The combined maximum output of these plants (2010) is between 540 and 550 million litres per day, and under normal circumstances the present-day average demand in the Dublin Region is between 530 and 540 million litres per day (1Mld = 1 million litres per day). So, on an average day, there is little or no spare capacity in the system. Comparing this (for example) to Paris, where water is supplied by three major water treatment plants, each operating at about 60% of maximum capacity, it is clear that Dublin has minimal capacity for managing peaks in demand and dealing with contingencies. Water treatment plants in the Dublin Region are operated at 96% of capacity or more, every day of the year. The fragility of this situation was starkly illustrated in January 2010 when substantial increased leakage caused by frost heave meant that demand for water in the region could not be met and severe supply restrictions had to be implemented.

The assessments of long term water supply needs in the Dublin Region were carried out in the context of best practice water conservation measures being implemented within the region. Between 1996 and 2002, leakage was reduced from 42% to 28% primarily through active leakage management programmes. Reducing leakage levels below 28% requires ongoing sustained network rehabilitation and a substantial replacement programme (costing approx €120m) began in 2007. Metering of all non domestic water supplies was completed in early 2009 and planning is underway in relation to the introduction (within the next 5-10 years) of water pricing policies which promote the responsible usage of water (e.g. domestic metering and charging - ref. Renewed Programme for Government, October 2009). This proposed water pricing policy is factored into the Plan in terms of reduced long term water usage and household leakage estimates.

This (non technical summary) document provides a summary of future supply-demand scenarios in the Dublin Region and evaluates potential new source / delivery systems including assessments of procurement and implementation programmes. Among the many water supply options evaluated, the current Plan recommends one particular option for advancement through the next stage of project development, the formal planning process, which is a key requirement for successful project delivery. The earliest that a new water supply scheme could be on stream is in 8 to 10 years, because of the lengthy planning and procurement procedures which must be complied with. Assuming planning takes 3-4 years (2014), realistic assumptions would be that procurement could take approximately 2-3 years (2016 / 2017) and construction 3-4 years (2020 / 2021).

This 'non technical summary' illustrates how the (Water Supply) Plan builds on the initial Feasibility Study (2004 / 05), the first phase of Strategic Environmental Assessment (SEA Phase 1 – 2006) and the subsequent Interim SEA (Phase 1) Statement accepted by Dublin City Council (Strategic Policy Committee) which established a comprehensive framework for the evaluations of potential realistic solutions for meeting the long term water supply needs of the Dublin Region, as outlined in the following sections.

2.4 PROJECT MILESTONES 1996 - 2009

Figure 2.1 outlines the key milestones in the project's development from the initial strategic study in 1996 (Greater Dublin Water Supply Strategic Study – GDWSSS 96) up to the present Plan (2010).

Sections 2.4 to 2.11 describe in greater detail the key activities corresponding to the project milestones in Figure 2.1.

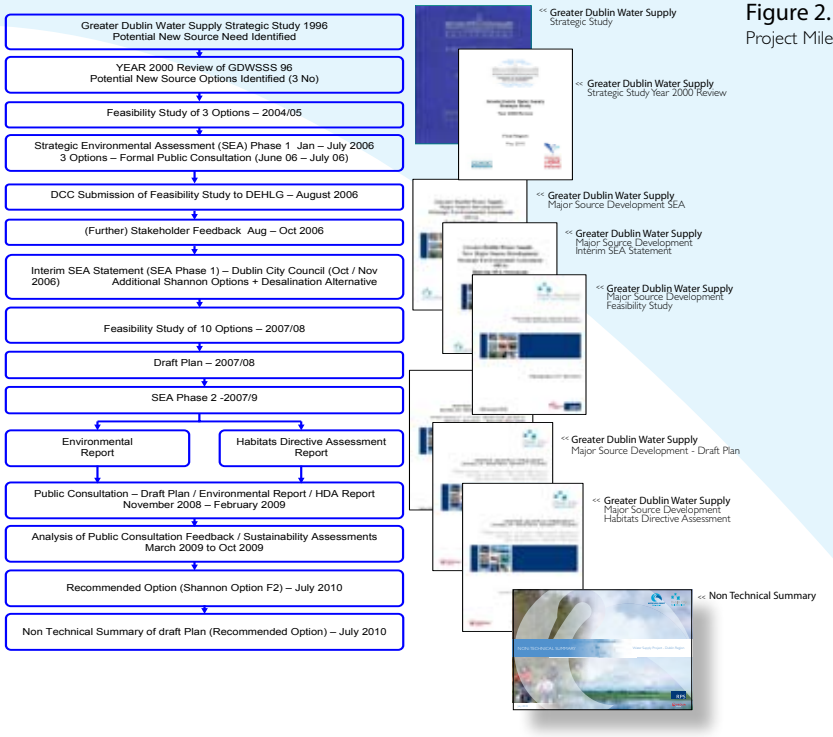
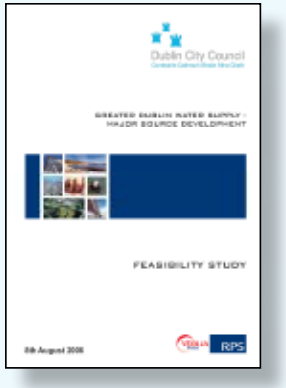


Figure 2.1
Project Milestones 1996 – 2009

2.5 GREATER DUBLIN WATER SUPPLY STRATEGIC STUDY 1996 / YEAR 2000 REVIEW

The potential need for a new water supply source for Dublin was a key recommendation of the strategic study into the Dublin Region's long term water supplies, carried out by the Department of Environment Heritage and Local Government (Greater Dublin Water Supply Strategic Study (GDWSSS) 1996). This study was reviewed and updated in 2000 (GDWSSS Year 2000 Review) and three initial supply options were identified for further study (Desalination / Shannon – Lough Ree / Liffey – Barrow).

2.6 FEASIBILITY STUDIES (3 OPTIONS) / SEA PHASE 1



A Feasibility Study of the three options identified in the 'DEHLG Year 2000 Review of GDWSSS 96' was carried out in 2004 / 2005. This was accompanied by the Strategic Environmental Assessment (SEA). The SEA process required the production of a Draft Plan (based on the Feasibility Study) and an Environmental Report. Formal public consultation on the Draft Plan and SEA Environmental Report took place in June / July 2006. Feedback from initial Public Consultation was very limited.

The Feasibility Study and SEA (Phase 1) recommended that the Shannon was preferable to Desalination or Liffey-Barrow and that the Lough Ree Shannon location should be investigated in greater detail, in the first instance, on account of its closest proximity to the Dublin Region. An Environmental Impact Assessment and detailed Hydrological Model would be required to assess the sustainability of the Lough Ree option. DCC submitted the Feasibility Study to DEHLG in August 2006.

2.6.1 SEA PHASE 1 – ADDITIONAL PUBLIC CONSULTATION

Subsequent to DCC's Feasibility Study submission (to DEHLG) in August 2006, further more detailed discussion took place with interest groups and individuals on the outputs from the Feasibility Study which were included in the Draft Plan. The relevant documents were widely advertised and presentations were made to interested stakeholder groups. Between August & October 2006 there was extensive media coverage of the Shannon – Dublin water supply proposals (Press / TV and Radio) and very detailed feedback was then provided to the Consultants, from many interested parties, primarily based in the Shannon catchment.

2.6.2 DUBLIN CITY COUNCIL – STRATEGIC POLICY COMMITTEE / EXPANDED RANGE OF OPTIONS

During August – October 2006 , following detailed feedback from stakeholders, DCC and its advisers (RPS – Veolia JV) concluded that the range of options which had been considered during SEA Phase 1 should be expanded and that further studies (including appropriate detailed modelling support) involving a wider range of options were required to identify the optimum solution to Dublin's impending water supply problems. The detailed modelling study was required to be capable of simulating the abstraction impacts of the various Shannon Options, taking account of other uses and controls on the Shannon lakes and the full range of climatic conditions in the catchment.

In October / November of 2006, the Strategic Policy Committee of Dublin City Council accepted the findings of the feasibility study and first phase of Strategic Environmental Assessment. They agreed that additional Shannon / Groundwater options should be investigated in greater technical detail. They also required that the Desalination option continue to be fully investigated to an equivalent level of detail as the Shannon options.

The expanded range of options (identified from the stakeholder feedback) included Lough Derg, Parteen Basin, use of external storage (cutaway / former bogs) and potential groundwater options. As a consequence of the extensive stakeholder feedback, the initial range of options (3 No.) was increased by an additional 7 No. options bringing the total for consideration to 10 No.

2.7 FEASIBILITY STUDIES (10 OPTIONS) / SEA PHASE 2 / HDA / PUBLIC CONSULTATION

Feasibility Studies of the expanded range of options were carried out in 2007 & 2008 including extensive consultations with statutory stakeholders. A second phase of Strategic Environmental Assessment (SEA Ph2) commenced in early 2008. In addition to the SEA an assessment of Natura 2000 sites under the Habitats Directive was also undertaken.

Formal public consultation (as part of the SEA Phase 2 process) took place from November 2008 to February 2009 on the expanded range of potential water supply options. Information in relation to the project was lodged in hardcopy format in 17 local authority libraries and all data was made available digitally via a dedicated project website www.watersupplyproject-dublinregion.ie. The public were informed of the availability of project data via newspaper advertisements in the Irish Times, Irish Independent and Belfast Telegraph on 22 November 2008. During the public consultation period, extensive presentations were made to a wide variety of stakeholders and considerable feedback was received in subsequent 'Question & Answer' sessions which were minuted and recorded. The dedicated project website registered in excess of 2,500 'hits'. At the end of the formal public consultation period on 27 Feb 2009, in excess of 50 formal submissions (written & email) had been received from stakeholders and the general public (see Table 2.2)

Over the consultation period, regular interviews with local radio stations and local newspapers (in the Shannon Catchment Area and in Dublin) also assisted in informing the public on the progress of the studies and advised of the availability of project details in newsletters / Local Authority libraries and on the dedicated project website.

All of the feedback has been collated and analysed. While confirming the likely need for the new scheme, the feedback established that an integrated water resource management solution be developed which would;

- Require a best practice approach to minimise both leakage and water demand by all consumers (including metering and charging by volume used)
- Ensure that a new major water supply to Dublin would not adversely impact on the environment (complying with the EU Water Framework Directive and the Habitats Directive), or the socio-economic wellbeing of any other catchment community (e.g. Shannon)
- Secure future water supplies to both the Midlands and Eastern Regions to support job creation in industry, tourism and the economy generally.

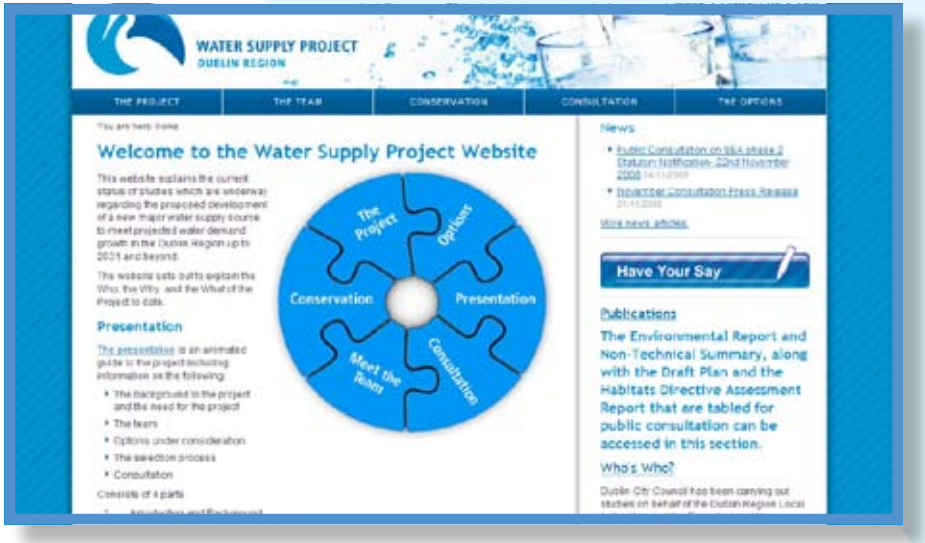


Table 2.2
SEA Phase 2 Public Consultation - Submissions & Presentations

- An Taisce
- Birdwatch Ireland
- Bord na Mona
- Border Midland and Western Regional Assembly
- Brian Pope (member of public)
- Chamber's Ireland
- Claire Wheeler – Green Party
- Clare County Council (Clare Co Co)
- Dublin City Council Strategic Policy Committee (SPC)
- Department of Communications, Energy and Natural Resources (DCENR)
- Department of Environment, Heritage and Local Government (DEHLG)
- DEHLG (National Parks and Wildlife Service)
- Dun Laoghaire Rathdown Co Co (DLRCC) SPC
- DEHLG (The architectural heritage advisory unit, The archaeological underwater unit and the national monuments unit)
- Dublin City Business Association (DCBA)
- Dublin Tourism
- Eastern Regional Fisheries Board (ERFB)
- Environmental Protection Agency (EPA)
- Electricity Supply Board (ESB)
- Fáilte Ireland
- Fintan Donnelly (member of public)
- Galway Co Co
- Galway Co Co SPC
- Geological Survey of Ireland (GSI)
- GMC Contractors
- Golden Eagle Trust
- Hugh Lee (member of public)
- Irish Business and Employers Confederation (IBEC)
- Irish Farmers Association (IFA)
- Irish Hotels Federation
- Inland Waterways Association of Ireland (IWAI)
- James Fenwick (former Dublin City Engineer)
- John McGinley (member of public)
- Ken Irvine (Environmental Expert)
- Kildare Co Co SPC
- Lansdowne Road Developments
- Laois County Council
- Lisheen Mines
- Longford Co Co
- Longford Heritage Forum
- Lough Derg Anglers Association
- Lough Derg Science Group (LDSG)
- Lough Derg Science Group, Shannon IRBD and Limerick County Council
- Mid East Regional Authority
- Mid West Regional Authorities
- Midlands Regional Authority
- North Tipperary SPC
- Northern Ireland Environment Agency
- Offaly Co Co
- Roscommon County Council
- Shannon International River Basin District (ShIRBD) Advisory Council Members
- ShIRBD Management and Steering Group
- ShIRBD Included copies of Submissions from SWAN (BirdWatch Ireland rep),SWAN (SOLD and VOICE rep), IFA representative and Chairman of the Advisory Council
- ShIRBD Limerick Co Co
- Shannon Protection Alliance
- Shannon Region Fisheries Board (ShRFB)
- Sinn Fein – Dublin
- Sinn Fein – Nenagh
- Sustainable Development Ireland
- Sustainable Water Network (SWAN) (SOLD and VOICE rep)
- The Heritage Council
- Warren Whitney (member of public)
- Waterways Ireland
- West Regional Authority
- Westmeath Co Co
- Wine Board Ireland

2.8 SCALE OF STUDIES – SELECTION OF RECOMMENDED OPTION

Over the 2004 – 2010 period, approx 100,000 man hours have been expended across many professional disciplines (Engineering, Scientific, Environmental, Geotechnical, Geological, Economic & Communications) in order to ensure a comprehensive understanding of the many complex issues involved in the development of a water supply project on the scale of the Shannon – Dublin proposals. Studies have been funded through the DEHLG approved Water Services Investment Programme (WSIP). Studies & Investigations to date have included;

- Feasibility Studies of Water Supply Options (10 No)
- Hydrological Modelling, Residence Time Modelling, Dispersion Modelling
- Aquatic & Terrestrial Ecology Assessments, Archaeological Studies
- Groundwater Studies & Desalination Studies
- Geological Assessments, Routing & Aerial Photography Assessments
- Topographic Surveys, Bathymetry Surveys
- Water Quality Analysis
- Climate Change Assessments, Demand Forecasting
- Economic & Socio Economic Assessments

All recent relevant documents can be found on the project website or within published documentation. The extensive and wide ranging studies and consultations have resulted in the recommendation of a preferred new water supply option for supplying the Dublin Region (Shannon Option F2 – see Section 7). It is recommended that this proposal for a long term solution to Dublin's water needs be brought forward into the formal planning process involving An Bord Pleanala. This will allow full public engagement in the formal Planning process involving comprehensive technical, environmental and economic appraisal by the Independent Planning Body before any decisions are made to proceed with the new water supply proposals.

2.9 DRAFT PLAN (2010) CONTENT & LAYOUT

Details of the recommended Water Supply Option are contained in the (Water Supply) Plan.

Figure 2.2 details the layout of the (2010) draft Plan. Following detailed consideration by DEHLG & Local Authorities the final adopted Plan will be made available on the dedicated project website www.watersupplyproject-dublinregion.ie.

Figure 2.2
Layout of Draft Plan (2010)

3 NEED FOR PROJECT

3.1 GOVERNMENT ECONOMIC GROWTH POLICY

High level Irish Government policy in relation to economic growth is set out in the National Spatial Strategy (NSS) 2002-2020 and the National Development Plan (NDP) 2007-2013. Both of these policy documents recognise that national economic-growth objectives will continue to require managed development of the Greater Dublin Area (GDA) / Dublin Region to its full potential since the Region is the economic powerhouse of the country as a whole, with over 50% of Ireland's economic growth generated there. Economic growth objectives are provided for in the (Dublin & Mid East) Regional Planning Guidelines (2010 – 2022), supported by Development Plans in each Local Authority area within the Region. The planned growth objectives in the Dublin Region as envisaged in the (2010 – 2022) Regional Planning Guidelines and National Spatial Strategy (2030) form the basis for estimating the extent of water availability which must be provided in order to sustain the economic growth targets. These long term growth forecasts take account of high and low / negative growth economic cycles and extend the consistent long term growth patterns for the region since 1960 (see Section 3.5)

3.2 ASSESSMENT OF DUBLIN REGION WATER NEEDS – METHODOLOGY

The assessment methodology for determining the extent of future water supply needs for the Dublin Region is based on an analysis of the 'Water Cycle' as outlined in Figure 3.1.
The Water Cycle tracks the movement of water from rainfall through raw water storage / water treatment and delivery to consumers via the water distribution network. At various points along the Water Cycle, stresses have been appearing over recent years as a result of continuously increased demand brought about principally by population growth increases.

Future climate change concerns, water quality improvement programmes and greater general environmental awareness have also given rise in recent years to new legislative requirements which also impact how the Water Cycle path is managed.

The key aspects of the Water Cycle which are relevant to the assessment of longterm water supply needs for the Dublin Region are as follows;

- Raw Water Storage / Treated Water Production & Storage
- Climate Change
- Distribution Network / Leakage
- Customer Supply Systems / Leakage

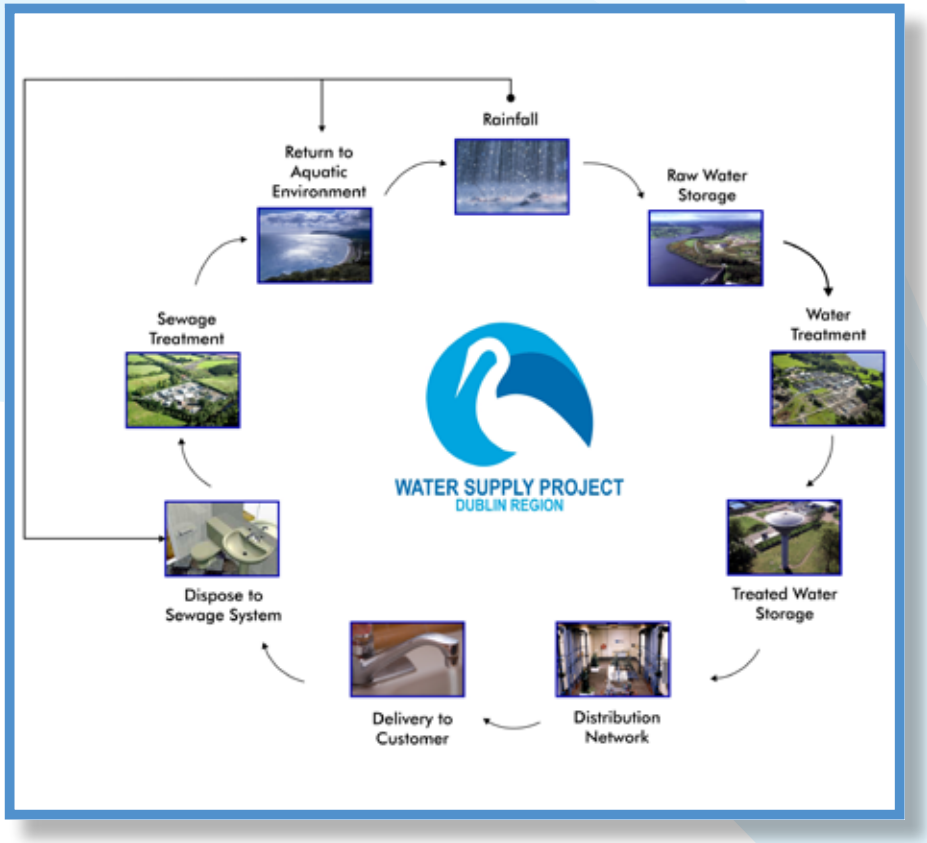


Figure 3.1
Water Cycle

3.2.1 RAW WATER STORAGE / TREATED WATER PRODUCTION & STORAGE

Rainfall on the Liffey Catchment provides 85% of the Dublin Region's current water supply needs. Raw water is stored in the Upper Liffey catchment at Poulaphuca reservoir. Poulaphuca is managed (by ESB & DCC) in order to make sustainable quantities of raw water available to DCC's water treatment plant at Ballymore Eustace (BME) and Fingal's treatment plant at Leixlip. The maximum sustainable availability of water from the Liffey source is 318Mld (BME) and 215Mld (Leixlip). These maximum sustainable production capacities are anticipated to be fully developed by 2014. Between now and 2014 there is some limited potential in the BME and Leixlip Water Treatment Plants to produce additional treated water quantities (see Table 3.1). This production methodology is not operationally sustainable but is being utilised to meet ongoing demand growth requirements.

The Vartry Catchment provides 75Mld of treated water at Roundwood and the Dodder provides 16Mld at Ballyboden. Groundwater sources in North Co. Dublin (3Mld) and Kildare (8Mld) also contribute small water quantities for the Dublin Region. There are also proposals to abstract water from the Barrow at Athy which will reduce Kildare's dependence on Dublin Region sources (by approx 10Mld – 15Mld).

Treated water is stored in multiple Service Reservoirs within the Dublin Region. These are managed by Operations staff in the Dublin Region Local Authorities to balance variations in hourly, daily and weekly demand. There is limited treated water storage available for meeting prolonged demand peaks (as was illustrated during the prolonged cold spell in January 2010).

The sustainable production from all existing Dublin Region sources when fully developed is estimated at 627Mld – available from 2014 onwards (assuming that Leixlip expansion is complete by 2013).

Source	Units	2009	2010	2011	2012	2013	2014	2015
BME (Sustainable)	Mld	274	318	318	318	318	318	318
Production 2009 / 2010*		294						
Leixlip (Sustainable)	Mld	148	148	148	148	148	215	215
Production 2009 – 2012*		168	168	168	168	168		
Roundwood	Mld	75	75	75	75	75	75	75
Ballyboden	Mld	16	16	16	16	16	16	16
Bog of the Ring	Mld	3	3	3	3	3	3	3
TOTAL Sustainable	**Mld**	**516**	**560**	**560**	**560**	**560**	**627**	**627**
Total Production*		**556**	**580**	**580**	**580**	**580**		
Kildare								
- Wellfields	Mld	3	3	8	8	8	8	8
- Barrow	Mld	-	-	-	-	30	30	**30**
Kildare Total	**Mld**	**3**	**3**	**8**	**8**	**38**	**38**	**38**

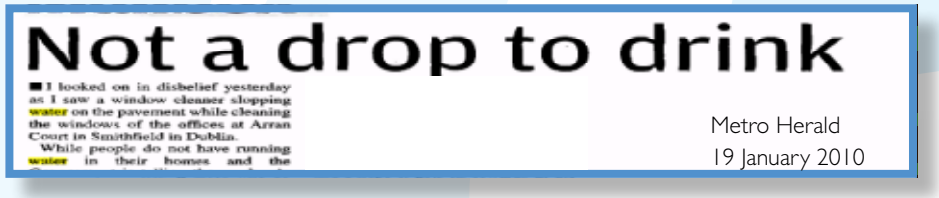
Table 3.1
Treated Water Production from Existing Sources
* Unsustainable production: plants are operating within their design capabilities but cannot operate indefinitely at these levels as it limits good maintenance practice.

Demand projections for the Dublin Region indicate that by the early 2020's, at the latest, the maximum sustainable production figure (627Mld) will have been reached despite the continuous implementation of best practice water conservation measures including leakage reductions and domestic metering and charging. During this period, the lack of headroom availability will continue to result in supply restrictions in exceptional circumstances (frost impact on leakage, prolonged drought, infrastructure failure, pollution incidents etc).

3.22 CLIMATE CHANGE

Climate change analyses for the East of Ireland project rainfall increases in Winter (+10% to +20% for 2010 – 2039) and reductions in Summer (-20% to -40% for 2010 – 2039). Projected increases / reductions in Winter / Summer rainfall for Ireland East have been advised by climate experts at NUI Maynooth (ICARUS). Raw water storage facilities at Poulaphuca and Roundwood have some limited potential for offsetting Winter rainfall increases against Summer rainfall reductions but the net effect of climate change will be a long term gradual reduction in the sustainable yield of Dublin Region sources.

Ireland generally, and the East in particular, have had a series of wet summers in recent years and consequently, raw water shortages in the Region, as a result of climatic factors, have not arisen. However, there is little doubt that if drought type weather patterns re-emerged in the East (e.g. 1975/76 & 1995) before supplies from a new source become available, significant water shortages, particularly in the Liffey, could occur, leading to a return of water rationing and restrictions. A new supply source is necessary to ensure that this situation does not materialise.



Not a drop to drink

I looked on in disbelief yesterday as I saw a window cleaner slopping water on the pavement while cleaning the windows of the offices at Arran Court in Smithfield in Dublin.
While people do not have running water in their homes and the

Metro Herald
19 January 2010

3.2.3 DISTRIBUTION NETWORK / CUSTOMER SUPPLY SYSTEMS

The Dublin Region water supply network is in excess of 8,000km in length. Approx 10% (800km) of the network is over 100 years old. There is substantial leakage from the network and work has been underway for over 15 years to reduce leakage levels. Progress on leakage reduction has resulted in leakage levels in excess of 40% in the late 1990's being reduced to 29% (2009) and the intent is to lower this further to a max 20% which is in line with best international practice for similar type networks. Leakage levels of 20% are regarded as the 'economic level of leakage' from international experience as reductions below this level are increasingly expensive and are not likely to be cost effective. Indeed, it will be a major challenge to reach this standard in the Dublin system, given the age of the network, the mix of pipe materials (cast iron, ductile iron, uPVC and some Asbestos cement) and historical under-investment

Substantial investment is required, even to retain the current leakage levels (28%), since without investment the networks will continue to deteriorate in a 'do-nothing' scenario. A major network rehabilitation programme, costing €120m, has been underway in the Dublin Region since 2007. This rehabilitation programme is a very significant step towards achieving targeted leakage reductions. Reducing leakage levels to 20% or below will require substantial replacement of the older mains (800km), involving continuing high levels of investment beyond the current programme. For the purposes of this project, the assumption is that all necessary measures will be taken to achieve and sustain a maximum rate of distribution leakage of 20%.

3.2.4 CUSTOMER SUPPLY SYSTEMS / CUSTOMER LEAKAGE LOSSES

Customer leakage losses average approx 65.0 litres per property per day (l/prop/d) for the Dublin Region (2009). This figure is broadly comparable to the UK where plumbing systems and operational pressures are similar. The introduction of water pricing policies which promote responsible usage of water (e.g. domestic metering and charging) could make significant inroads into reducing this figure as meters located on property boundaries (for example) enable detection of larger leaks at time of installation. The 65l/prop/d would likely be halved post installation of metering and further reductions could be achieved as records become available of customer usage patterns over the short to medium term.

3.3 WATER DEMAND GROWTH

Demand for treated water in the Dublin Region currently exceeds the sustainable production capability of the four existing water treatment plants and consequently there is little or no headroom available for managing contingencies or enabling maintenance activities on critical infrastructure which cannot be taken out of service. Whilst operating with little or no headroom, demand growth over the past decade in the Dublin Region has largely been met by water savings from leakage management, water conservation initiatives, and incremental expansion of Ballymore Eustace water treatment plant and operation of all treatment plants beyond their sustainable production capacities. Short term future demand growth will continue to rely on further water savings from sustained leakage management and water conservation, including planned network rehabilitation, in combination with limited additional water availability resulting from the expansion of Ballymore Eustace and Leixlip water treatment plants to their maximum sustainable limits.

The scale of increased water availability from these initiatives, however, will at best maintain the status quo taking account of the increasing short term water demand growth in the Region. The increased water availability from these initiatives will not address the lack of strategic 'headroom' capacity in the Region and can only be expected to balance average demand growth. Given the age of the network and its vulnerability to leakage from pressure variations, frost heave, failure of joints and corrosion effects on pipelines, the water supply to the Dublin Region (Water Supply Area) will remain marginal in its ability to meet essential demands even with major capital investment over the coming years in production and implementation of best practice water conservation & leakage reductions.

The demand projections for the Dublin Region, combined with the lack of headroom availability in the supply system, makes it imperative that the Region must plan now for a situation where supplies from a new source could first be required by the Region in less than 10 years, with the deficit increasing annually thereafter. During the planning process (estimated approx 3 years) the demand / supply situation can be kept under continuous review in order to optimise the timing of implementation of the new supply scheme, recognising that at least 6 years will be required for procurement, construction and commissioning of the project.

3.4 DEMAND PROJECTIONS 2009 - 2031 +

The RPS – Veolia analysis of projected water demand growth in the Dublin Region (Water Supply Area) for the 2010 – 2031+ period, has built on the findings of the DEHLG 1996 and 2000 studies and includes assessments of projected population growth (as per the 2010 - 2022 Regional Planning Guidelines & National Spatial Strategy 2030), economic growth projection ranges and anticipated water savings from leakage management / water conservation measures. Two principal demand growth scenarios have emerged from the analyses – Minimum Planning Scenario & Maximum Planning Scenario.

The ' Minimum Planning Scenario' demand projections assume that best practice water conservation measures are being implemented in the Dublin Region in advance of the introduction of any supplies from a new source;

Minimum Planning Scenario

- Low to Medium Economic Growth (all current zoned lands developed fully only by 2040)
- Full introduction (and benefit) of water pricing policies which promote responsible usage of water (e.g. domestic metering and charging)
- Reductions in personal usage (resulting from metering & charging)
- Reductions in customer leakage (resulting from metering & charging)
- Reductions in Distribution Network Leakage (Network Rehabilitation) to 20%

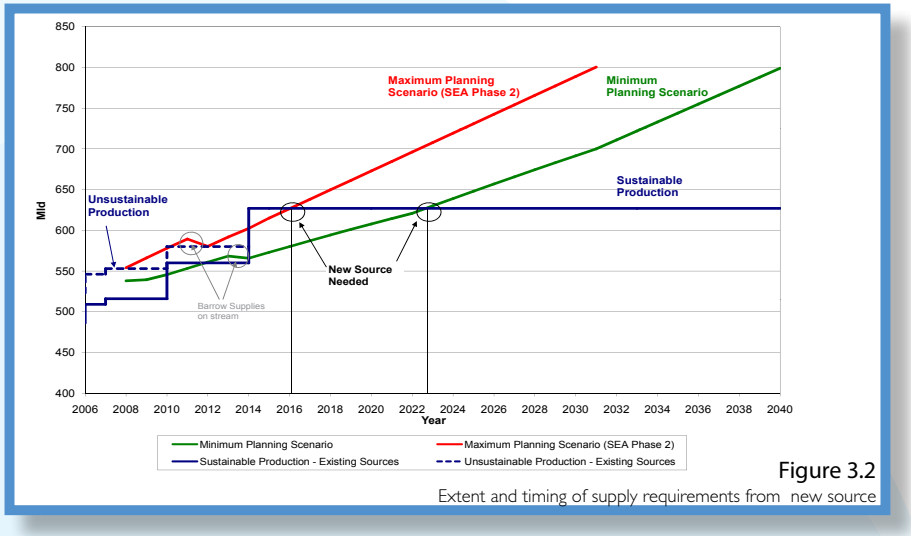


Figure 3.2
Extent and timing of supply requirements from new source

In the Minimum Planning demand growth scenario, supplies from a new source will be required by (latest) 2022 when average day demand equals the sustainable production capacity of existing sources (627Mld). The timing of new supply requirements for this scenario is illustrated (solid green line) in Figure 3.2. If planned leakage targets or savings from reduced personal consumption experience slippage, then the demand projections represented by the 'green line' will move backwards towards the 'red line' necessitating an earlier need for water supplies from a new source or regular supply restrictions in its absence.

In the Maximum demand growth scenario (Strategic Environmental Assessment Phase 2 Planning Scenario) involving higher economic growth rates and reduced savings from water conservation & leakage, supplies from a new source could be required as early as 2016 (red line) in Figure 3.2.

The Minimum demand growth profile represents the likely lowest practical and economic demand growth scenario. It assumes maximum water savings are achieved through best practice management of leakage and lowering of consumption by domestic and non domestic water users. This approach, which was advocated in much of the SEA public consultation stakeholder feedback, is fully accounted for in this scenario. In order to plan prudently for slippages in achievement of water savings from leakage reductions and water conservation it is recommended that supplies from a new source are planned to be available from 2020 onwards. This date also represents the most likely 'earliest delivery date' for the project (Planning Process 4 years / Procurement 2 years / Construction 4 years).
The Minimum & Maximum Planning demand growth scenarios are illustrated schematically in Figure 3.2.

3.5 CYCLICAL GROWTH PATTERNS

Water demand growth in the Dublin Region has increased in line with population growth for over 50 years. During this period, many economic cycles have been experienced, with water demand patterns mirroring economic growth rates, but long term water demand growth has continued at a consistent 1% - 2% underlying annual growth rate. Operational experience in the Dublin Region would strongly indicate that growth rates will continue to increase as the current economic cycle returns to normal growth patterns. Figure 3.4 illustrates historic population growth in the Greater Dublin Area (GDA) from 1961 to 2009 and the range of Central Statistics Office GDA population growth projection scenarios for the 2009 – 2031 period which are currently being planned for as part of this study. Demand for treated water has increased in proportion to population growth between 1961 and 2009.

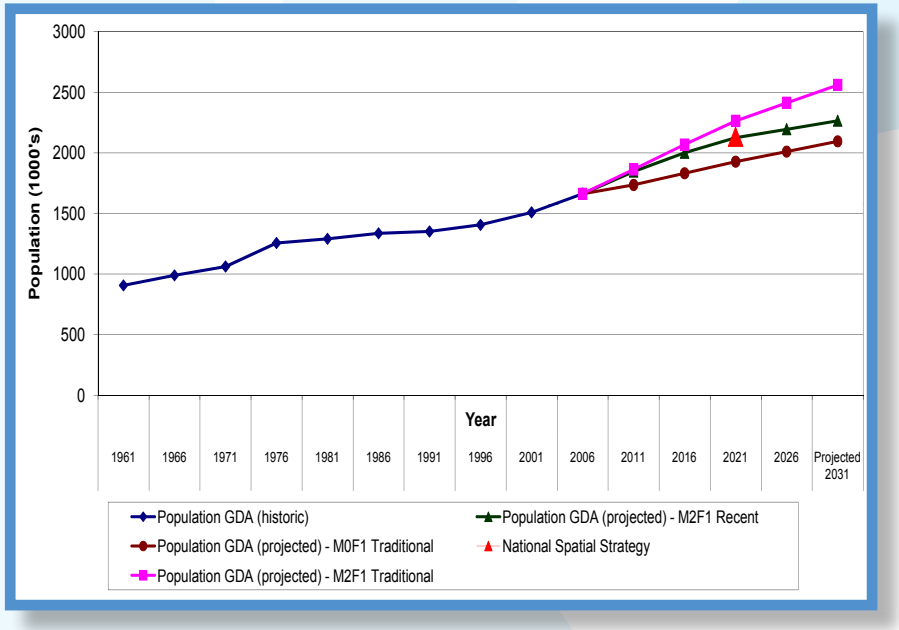


Figure 3.3
GDA Population Growth 1961-2009 & CSO Projections 2009-2031

3.6 QUANTITY OF SUPPLY REQUIREMENTS FROM NEW SOURCE

Dublin Region demand projections have been estimated as follows for the minimum & maximum demand growth scenarios;

a) The Minimum Planning Scenario (following review of post 2008 projections) – 800Mld average is required at 2040

Dublin Region (Water Supply Area)	1996	2008	2016	2022	2031	2040
Average Total Demand (Mld)	460	540	580	621	700	800
Max. Production of Dublin Region Sources (Mld)	470	560	627	627	627	627

Table 3.2 Minimum Planning Scenario

b) SEA Phase 2 Scenario (as laid out in draft plan) – 800Mld average is required at 2031

Dublin Region (Water Supply Area)	1996	2008	2016	2022	2031	2040
Average Total Demand (Mld)	460	540	627	670	800	-
Max. Production of Dublin Region Sources (Mld)	470	560	627	627	627	-

Table 3.3 Maximum Planing Scenario (SEA Phase 2)

Maximum Sustainable Production of existing Dublin Region sources is 627Mld. At the time of SEA preparation it was envisaged that supplies from a new scheme could be needed as early as 2016 (see Table 3.3). The most recent updates of demand projections which take account of proposed Government Policy in relation to domestic metering indicate that supplies from a new scheme are required by (latest) 2022 (see Table 3.2).

The extent of supply requirements from a new source have been calculated as shown in Table 3.4.

Maximum Sustainable Production of existing Dublin Region sources is 627Mld
Supply requirements from a new source have been calculated as shown in Table 3.4

Average Supply Requirements (at 2031 / 2040) = 800 Mld – 627 Mld	=	173 Mld
Additional Peak Requirements (at 2031 / 2040)	=	80 Mld
Supply Allowance for Midlands Local Authorities	=	50 Mld
Headroom (Contingency) Allowance	=	50 Mld
Supply (new source) Total	=	353 Mld

(approx 350Mld)

~4m³/s
size equivalent to BME (318Mld)

Table 3.4 New Source Supply Requirements

The supply of 350Mld is a maximum planning figure. Supplies will be brought on stream gradually over two phases. The overall quantity of treated water production will increase on a pro-rata basis as demand increases.

3.7 DO-NOTHING OPTION – NEW SOURCE

The foregoing analysis demonstrates that an integrated water resource management approach which minimises leakage and demand growth in the Dublin Region (with associated heavy investment) cannot meet the demand needs beyond 2022 without a new source. If a new source is not provided, the consequences would be supply restrictions of increasing frequency with impacts on social and economic interests combined with constraints on new development including employment generation in the Region.
Recent short term water supply shortages served to underline the socio-economic implications of failure to plan for and implement adequate water resources to meet daily needs. These include:

- Risks to critical services such as hospitals, schools and the like
- Risks to employment due to impacts on industry and commercial business
- Risks to the public due to water unavailability for essential daily needs
- Operational risks due to emptying of mains, air entrainment and risk of pollution.

Chronic water shortages magnify the effects on consumers and can undermine investor confidence in economic enterprise. Adequate water supplies on the other hand can be a key strategic advantage for promotion of a region for water using industry, large scale tourism and other added value activity.

4 WATER SUPPLY OPTIONS EXAMINED

The Year 2000 Review of the Greater Dublin Water Supply Strategic Study (1996) identified three potential new source options for investigation (see Section 2.5), with a view to assessing their potential for supplying the Dublin Region with secure sustainable long term water supplies. Following Feasibility Studies (2004 / 2005), these three options were tabled for public consultation within the SEA Phase 1 process in 2006. Feedback from public consultation resulted in Dublin City Council including a wider range of water supply options (10 No) in follow - up Feasibility Studies during 2007/8. These ten options were considered in detail as potential new supply sources for the Dublin Region and underwent a second phase of SEA. The 10 water supply options are outlined schematically in Figure 4.1.

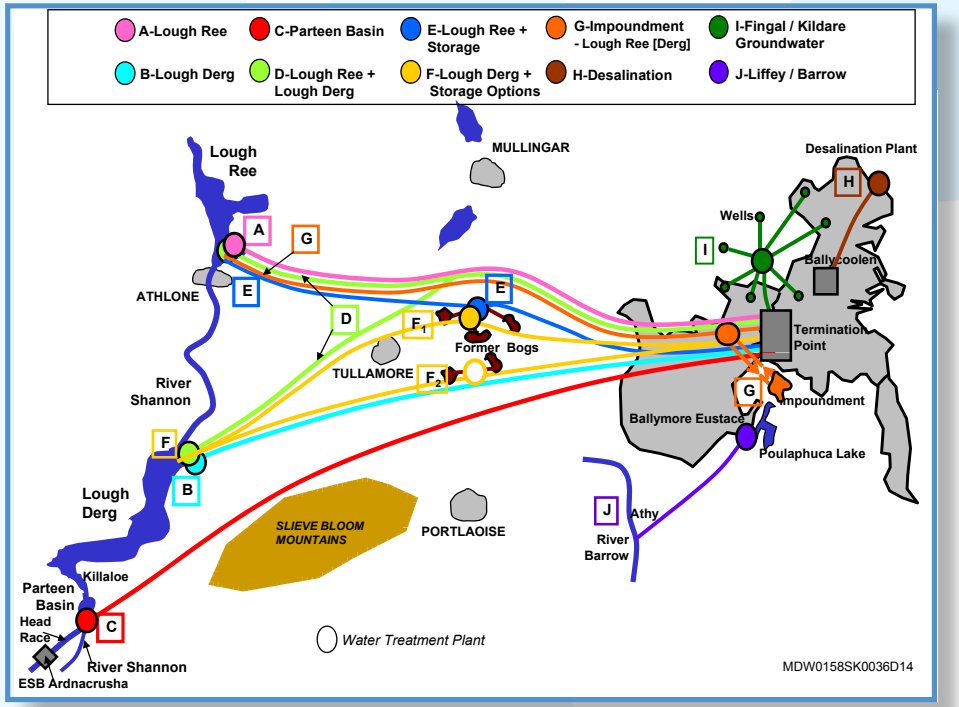


Figure 4.1
Water Supply Options

4.1 RIVER SHANNON WATER SUPPLY OPTIONS EXAMINED IN STUDY

Of the ten (10) water supply options which were considered, seven (Options A to G) have Shannon storage locations as their water supply source. These are:

A. Lough Ree (Direct)

B. Lough Derg (Direct)

C. Parteen Basin (Direct)

D. Lough Ree and Lough Derg (Phase 1 Abstraction Lough Ree (250Mld) followed by Phase 2 (100Mld) Lough Derg)

E. Lough Ree and Storage (Use of storage in Bord na Mona owned, cutaway bogs to enable excess winter water (when Shannon is in flood) to be stored for later use in drier summer periods)

F. Lough Derg and Storage (Use of storage in Bord na Mona owned, cutaway bogs (F1 & F2) to enable excess winter water to be stored for later use in drier summer periods)

G. Impoundment (Abstraction from Lough Ree in high flow periods. Raw water impounded in dams / valleys in Dublin / Wicklow mountains for use during Shannon low flow periods)

All River Shannon water supply options would involve the construction of pumping facilities to abstract raw water, and pipelines / treatment plants to bring treated water to consumers in the Dublin Region.

Options A – D rely on existing Shannon lake storage while Options E – G involve supplementary external raw water storage.

Options A - F have the potential to supply treated water to Local Authorities en route between the Shannon and Dublin.

4.2 IRISH SEA WATER SUPPLY OPTIONS EXAMINED IN STUDY

H. DESALINATION

A number of potential desalination sites were examined. The optimum Desalination water supply option is outlined in Figure 4.2. This option would involve the construction of a Desalination Plant (optimum site identified in North-East Fingal) and pipelines to transport the desalinated water to the Dublin Region water supply network at Ballycoolen Reservoir. This option has been examined in full technical, environmental and economic detail for comparison with fresh water options.

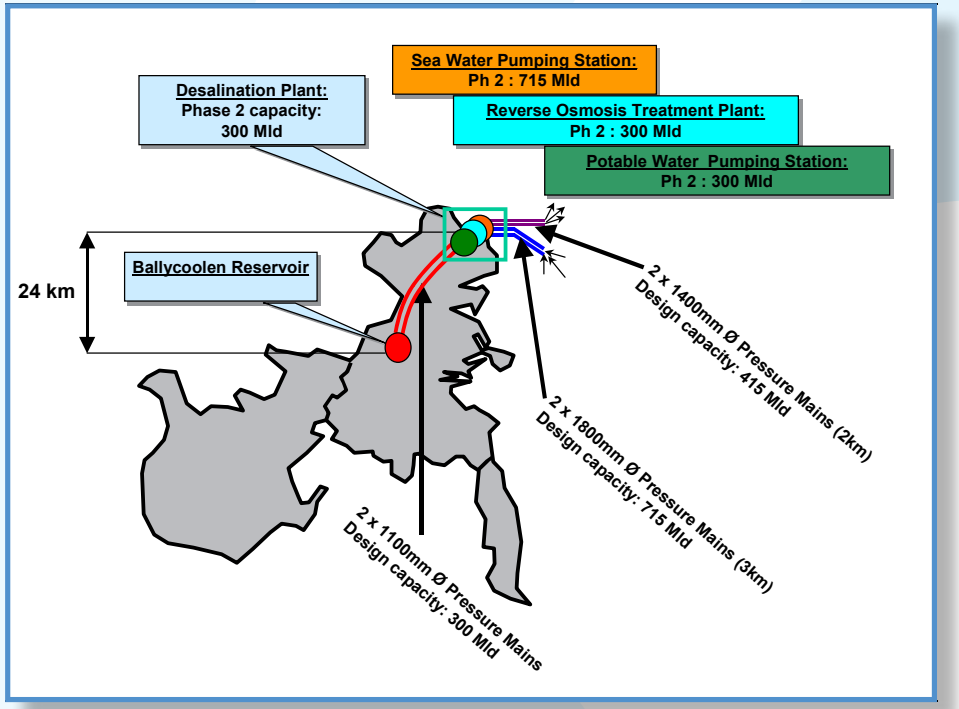


Figure 4.2
Desalination Option Schematic

4.3 OTHER WATER SUPPLY OPTIONS EXAMINED IN STUDY

I. GROUNDWATER

This water supply option examined the potential for the development of groundwater supply sources in the Fingal and Kildare areas and extending out to all areas within an 80km radius of Dublin.

J. LIFFEY BARROW CONJUNCTIVE USE

Approx 50% of the Dublin Region's water supply comes from Poulaphuca Lake on the Upper Liffey via Ballymore Eustace Water Treatment Plant. The Liffey-Barrow 'conjunctive use' option would involve sustainable abstractions of water from the River Barrow when sufficient quantities of water may be available (e.g. during higher flow periods) and combining these abstractions with variable abstractions from Poulaphuca with a view to increasing the overall supply to Ballymore Eustace Water Treatment Plant over and above what is sustainably available from Poulaphuca on its own.

4.4 GENERAL OPTIONS OVERVIEW

All options considered are not of equal merit. Some have capacity limitations (e.g. Groundwater & Liffey Barrow) and are unable to meet anticipated supply requirements. Some options are preferred over others from an environmental perspective and there are cost differences between options which have to be assessed in conjunction with their technical & environmental performance.

5 CONSTRAINTS

The water supply options for meeting longterm water supply needs in the Dublin Region were developed and evaluated within a framework of technical, environmental, legal, cost and programme constraints in order to identify a recommended preferred option which would be both viable and sustainable.

6 EVALUATION OF OPTIONS

6.1 OPTION EVALUATION METHODOLOGY

The Option Evaluation methodology which was used for assessing water supply options is based on the Dept of Finance Guidelines and involved two separate but interrelated processes;

1. Multi Criteria Analysis / Sustainability Assessments
2. Strategic Environmental Assessment / Public Consultation

Multi Criteria Analysis / Sustainability Assessments and Strategic Environmental Assessment/ Habitats Directive Assessment / Public Consultation processes are closely linked (see Figure 6.1). This reflects the overlap in environmental considerations within the two separate processes.

The results of the evaluations lead to the recommended preferred option being selected.

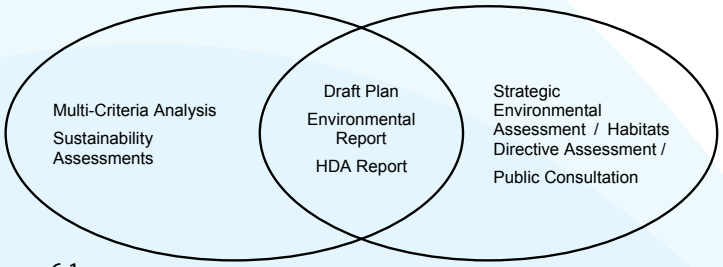


Figure 6.1
Multi Criteria Analysis / Sustainability & Strategic Environmental Assessments

6.2 OPTION EVALUATION & SELECTION PROCESS

Figure 6.2 outlines the overall Option Evaluation & Selection process. The 'Preliminary Evaluation' stage includes the initial Feasibility Studies of 3 Options, followed by SEA Phase 1 which resulted in an expanded range of options and Feasibility Studies of the total options (10 No.) which were considered.

The 'Detailed Evaluation' stage involved the Multi Criteria Analyses (MCA) / Sustainability Assessments leading to the development of the Draft Plan which was tabled for Public Consultation under SEA Phase 2 in conjunction with the Environmental and Habitats Directive Assessment (HDA) Reports.

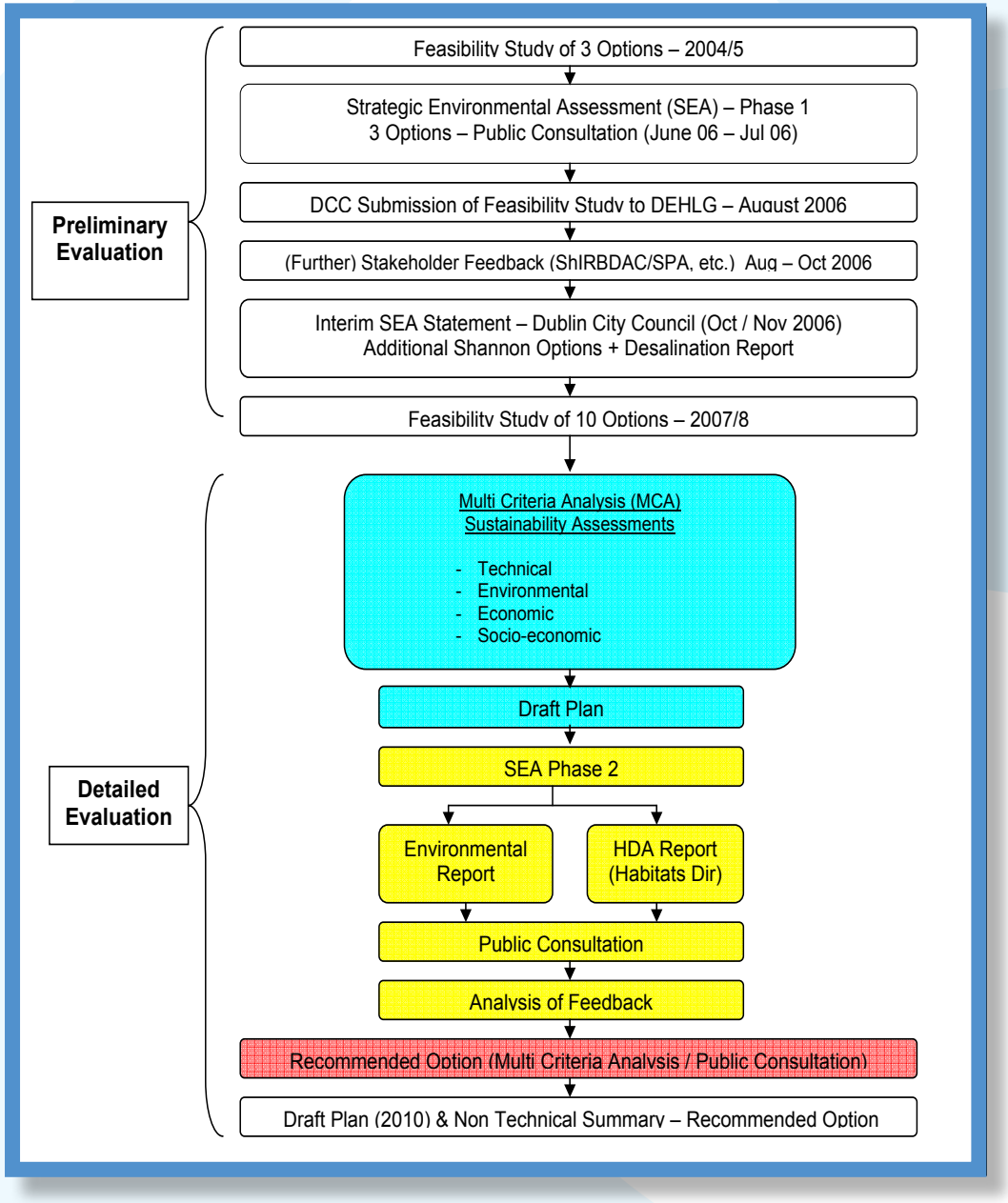


Figure 6.2
Option Evaluation & Selection Process

Multi Criteria Analysis (MCA) – technical / environmental / economic / socio-economic evaluation of options to assess the potential for compliance with the principles of sustainable development

Strategic Environmental Assessment (SEA) of options including feedback from SEA public consultation

7 RECOMMENDED OPTION

7.1 RESULTS OF MCA & SEA / RISK EVALUATIONS

The output from the sustainability evaluations (MCA & SEA / HDA Evaluations) led to a ranking of options as follows:

1) Option F2 – Northern Lough Derg with external Storage
2) Option B – Northern Lough Derg (direct)
3) Option C – Parteen Basin (direct)
4) Option H - Desalination

7.2 HABITATS DIRECTIVE ASSESSMENT

The Habitats Directive Assessment (Appropriate Assessment) showed that Options B, C, F2 and H are unlikely to have any adverse impact on the integrity of the European sites within the Study area. Options A and D do not meet the HDA Appropriate Assessment test even after mitigation measures have been included and therefore they cannot be adopted. The Precautionary Principle has been applied to Options E and G as existing data does not provide enough certainty to determine that there is no risk to the integrity of a European site. Further studies would be required to alter the existing conclusions of the Appropriate Assessment for Options E and G – these would also likely prove inconclusive.

7.3 RECOMMENDED OPTION

Option F2 is the Recommended Option for meeting the Dublin Region's long term water supply needs in conjunction with the existing Dublin sources which will continue to supply the region with the bulk of its water supplies into the foreseeable future. Option F2 is outlined in Figure 7.1 in schematic form.

Option F2 includes the following;

- Midlands storage facility capable of storing excess winter Shannon water for use in the Midlands, Mid East and Dublin Regions
- Raw water abstraction from Lough Derg with pumping facilities set back from the lake and pipelines from the pumping station to the Midlands storage lakes
- Storage facilities will accommodate at least 2 months average supply requirements which enables limiting or eliminating abstractions from Lough Derg at times of extreme low flow
- Treatment of water at the Midlands storage location and pumping (through pipelines) to the Dublin Region for integration into the current water supply network
- Distribution of treated Shannon water from Midlands reservoirs to Midland & Dublin Local Authorities.

>> See figure 8.1 (Page 26) for a full outline of the recommended option

7.4 MERITS OF RECOMMENDED OPTION F2

Option F2 is the minimum cost option which is capable of meeting the Dublin Region's long term water supply needs up to 2040 and beyond, whilst complying with all significant environmental constraints. The incorporation of large scale external raw water storage into the overall water supply scheme (through use of BNM cutaway bogs), in conjunction with abstraction of raw water from Lough Derg's storage (controlled by ESB), ensures that the solution is technically robust and capable of meeting the long term demand requirements of the Dublin & Midland Regions, in an environmentally sustainable and cost effective manner.

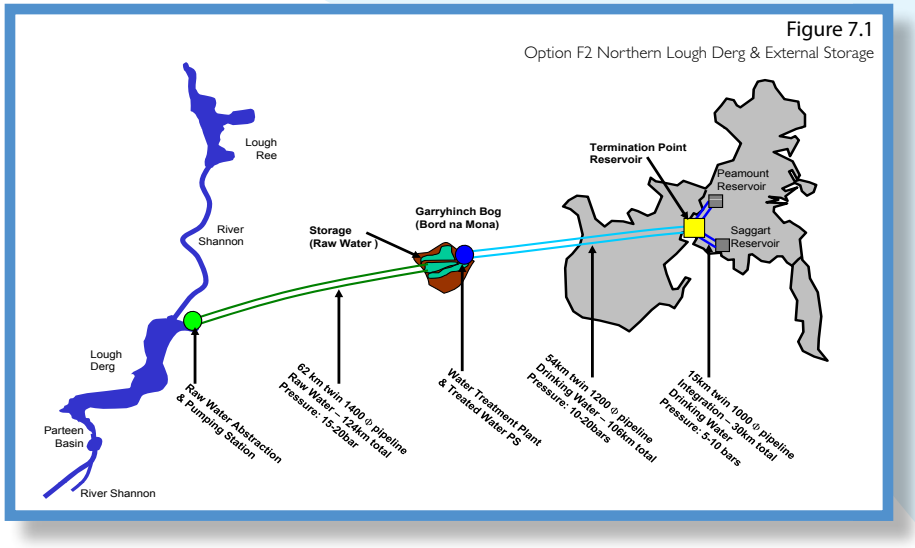


Figure 7.1
Option F2 Northern Lough Derg & External Storage

The recommended solution has evolved through the Strategic Environmental Assessment and Habitats Assessment processes, involving considerable stakeholder input through formal public consultation and extensive engagement with multiple Shannon based stakeholder groups over a 5 year period. It is a more sustainable and cost effective option than all other available alternatives. The recommended solution benefits local Midland's communities through the development of nature parks associated with raw water storage, provision of (indirect) water supplies to the Royal Canal and provision of water supplies particularly to Offaly and Westmeath County Councils. Option F2 impacts on 5 counties between the Shannon and Dublin and if implemented has the potential for making strategic water supplies available in these counties or neighbouring counties.

A number of environmental / technical & economic advantages of the recommended scheme are outlined as follows;

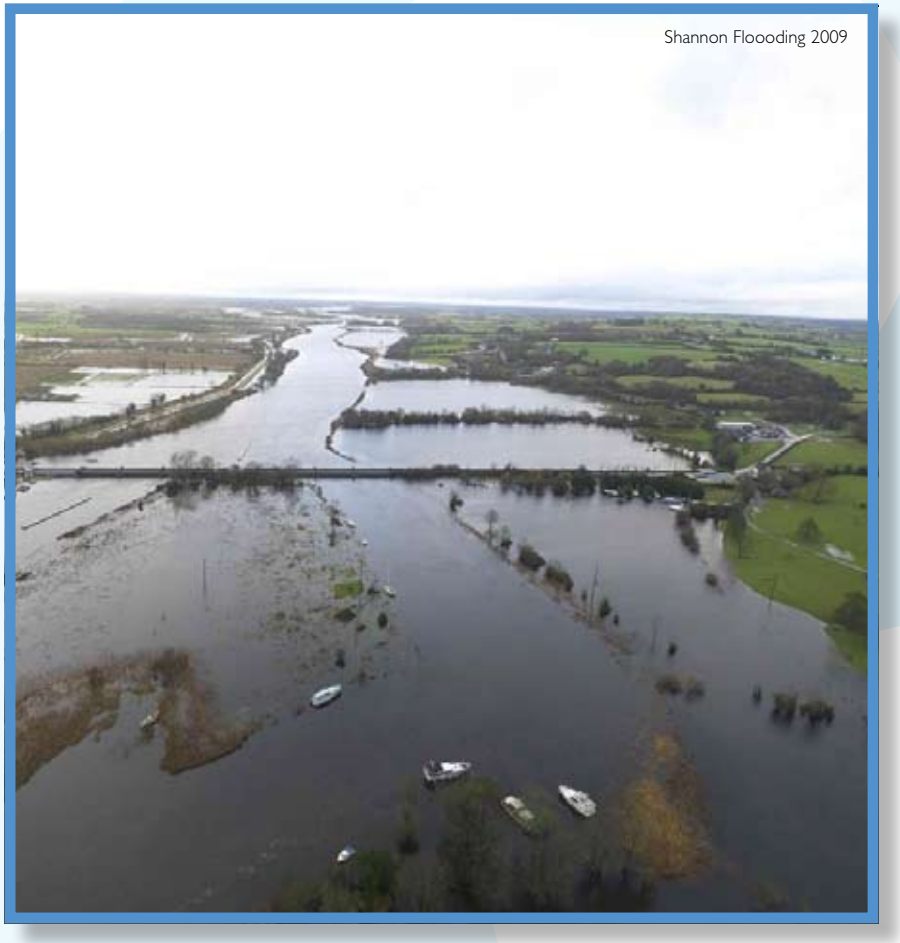
ENVIRONMENTAL AND SOCIAL ADVANTAGES

- Operational lake levels in Lough Derg are not affected by water abstractions for Dublin as ESB hydropower generation activities at Ardnacrusha provide counter balancing effects
- The proposed raw water storage at Garryhinch* creates a Midlands lake with water abstracted during high flow & flooding periods on the Shannon
- Abstraction-related' increased residence times and associated environmental issues, which represented a significant stakeholder concern in Lough Derg, are minimised during low flow periods as raw water storage at Garryhinch (cutaway bog storage site) allows abstractions to be reduced or eliminated when Shannon flows are extremely low
- Storage facilitates relocation of substantial infrastructure footprint (e.g. Treatment Plant) from the sensitive Shannon landscape to the Midlands bog site where it can be accommodated without significant visual impact
- Supply of treated water to Westmeath (Mullingar) indirectly enables the upgrading of the water supply to the Royal Canal by releasing Lough Owel flows from water supply to support the canal flows
- Large scale raw water storage will secure the Dublin Region water supply, while supporting the development of water based amenities and environmental parks with knock – on tourism benefits for the Midlands as a secondary benefit. Proposed eco-tourism facilities at the site are being modelled on similar facilities which were created at Rutland in the UK by Anglian Water where bird watching, angling and water sports have considerably enhanced the economic earning potential of the region. The core range of ideas and uses for the Garryhinch raw water storage reservoir are unlikely to differ markedly from those seen elsewhere. Typologies and concepts are likely to include;
  - » Non motorised water sports: Dingy sailing, windsurfing, kite surfing, canoeing/ kayaking
  - » Natural Environment: Bird watching, ecology zones and interpretation and angling, perhaps a lido and beach for peak summer season activity and events
  - » Trails: Cycle, walking and jogging
  - » Events: sport related (Triathlon, open water swimming) and other (concerts, education, special interest groups)
  - » Landscape Design: high quality parkland surrounding the reservoir and water features
  - » Education: Education centre and officer to accommodate education tours in relation to water conservation and treatment.
- This reservoir is proposed to be the first dual purpose reservoir in Ireland designed from the very beginning to meet two core functions i) water supply and ii) recreation & leisure.
  - » It will be designed to offer ease of recreational use and optimal access to the public
  - » It will factor in security, and health & safety issues
  - » It will be a key element of the tourism offering at a local, region and national level
  - » It will seek to develop links and networks with other similar reservoir destinations internationally.

*Bord Na Mona eco-tourism plans for Garryhinch and surrounding areas are available on the Bord Na Mona website www.bnm.ie. Bord Na Mona are cooperating closely with Dublin City Council and the Department of Environment Heritage & Local Government in relation to the development of this water supply project.

TECHNICAL & ECONOMIC ADVANTAGES

- Large scale raw water storage at Garryhinch provides back-up in the event of unforeseen circumstances arising (e.g. major pollution incident on the Shannon) increasing the robustness of the supply to the Regions served
- Storage provides a facility to manage peaks in water demand from the Midlands (Garryhinch) rather than from the Shannon. This involves savings in infrastructure and operation costs



Shannon Floooding 2009

- Raw water Midlands storage facilitates reductions in treated water storage needs in Dublin because of the scale of strategic storage proposed for Garryhinch
- Raw water storage facilitates optimum use of renewable power (wind) to pump raw water, accommodating the intermittent nature of this energy source

8 INFRASTRUCTURE – RECOMMENDED OPTION

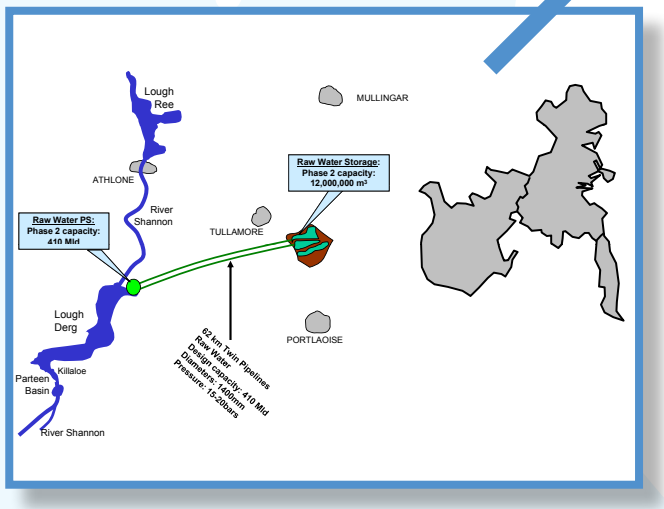
8.1 KEY INFRASTRUCTURE COMPONENTS

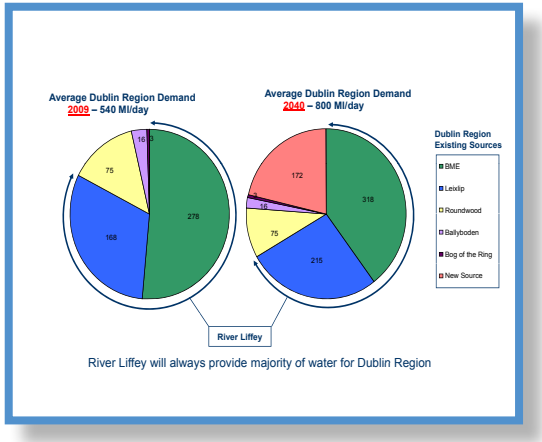
The recommended water supply scheme (Option F2) to bring treated water to the Midlands, Mid East & Dublin Regions involves;

- Large scale storage of raw water* in Garryhinch cutaway / former bog (owned by Bord na Mona and located near Portarlington – see Figure 8.1)
- Water treatment facilities at Garryhinch to produce potable water for supporting economic development and job creation in the Midlands, Mid East and Dublin Regions
- Abstraction facilities at northern Lough Derg (on the Shannon River) and pipelines to transport raw water to the raw water storage lakes at Garryhinch
- Pipelines for delivery of treated water to Midland Region reservoirs and to Saggart and Peamount Service Reservoirs in the Mid East & Dublin Regions (see Figure 8.2)

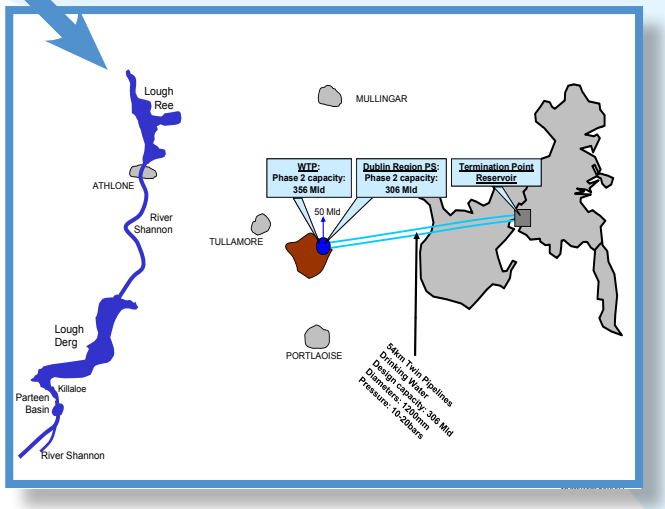
* Raw water storage in Midland bogs fits into Bord na Mona's strategic plans for ecotourism and complements the Lough Boora Parklands development

Figure 8.1
Aerial view of Garryhinch WTP and Storage, Raw Water Pipelines and Treated Water Pipelines





River Liffey will always provide majority of water for Dublin Region



8.2 PROJECT

SCHEMATIC

The recommended water supply scheme (Option F2) is shown in Figure 8.2 below in schematic form.

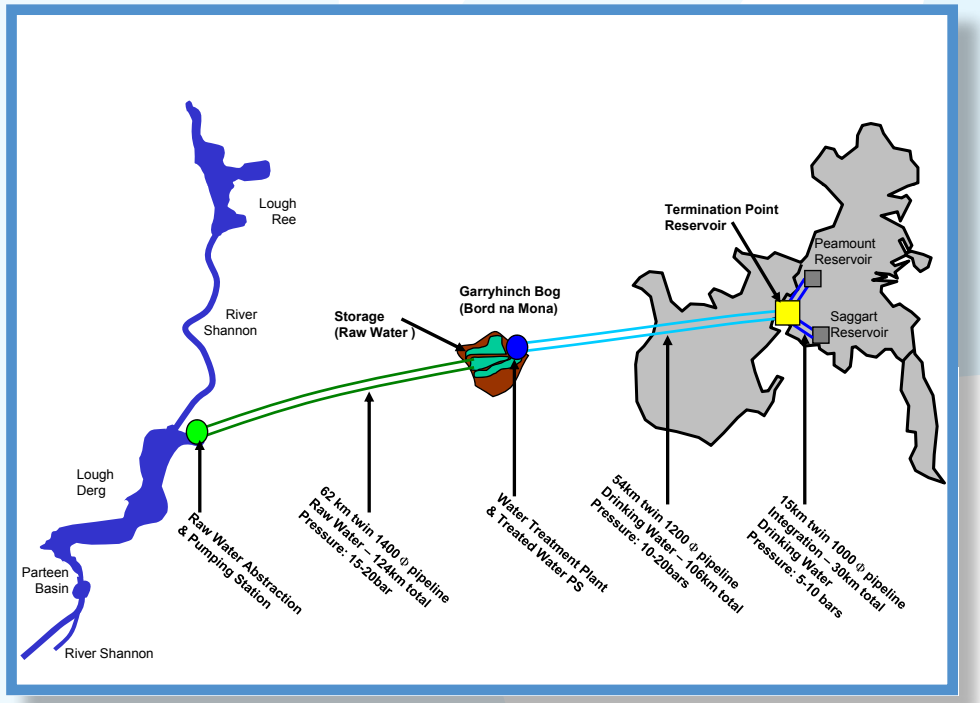


Figure 8.2
Option F2 Northern Lough Derg & External Storage

Table 8.1 summarises the key infrastructure components of the recommended water supply option (Option F2).

Pipelines	Raw Water	62km: • Twin 1 400mm diameter
	Treated Water	54km: • Twin 1 200mm diameter
	Major Urban and semi urban distribution pipelines	15km: • Twin 1 000mm diameter
Raw Water Pumping Station		4.8m³/s capacity / 16MW power
Treated Water Pumping Station		3.5m³/s capacity / 10MW power
Water Treatment Plant		356 000 m³/day production capacity
Termination Reservoir		40 000m³ balancing capacity (Phase 2)

Table 8.1
Infrastructure Details – Option F 2

9 COST OF RECOMMENDED OPTION

Table 9.1 provides summarised estimates of Capital Costs, Operating Costs and indicative Water Delivery Costs. The estimates are based on 2009 labour, plant and material prices. The actual cost of the scheme will emerge following a competitive tendering process which should secure maximum value for water consumers.

The anticipated delivery cost of water from the new scheme compares favourably with existing schemes in Dublin and throughout the country generally. The new scheme can embrace all the latest technologies and cost efficiencies which are features of modern international water treatment & delivery systems.

Table 9.1
Capex / Opex / Water Delivery Cost

CAPITAL COST	€470m	Capital Costs approx €120m per annum over approx 4 years construction (2017 – 2020)
OPERATING COST (per annum)	€8m (2020) €15m (2040)	Operating Costs are dependent on water throughput
Net Present Value (NPV) CAPEX + OPEX / Water Delivered (25 years)	0.41 €m3	'Operational' Component is 0.09€m3

10 PROGRAMME – IMPLEMENTATION

A summary of the programme for project delivery is outlined in Table 10.1.

Table 10.1
Programme Summary

Non Technical Summary of draft Plan to Stakeholders	July / August 2010
Interim Briefing of Stakeholders	July - October 2010
Publish Adopted Plan & SEA Statement	Nov / December 2010
Planning Process – EIA & An Bord Pleanala	4 Years
Procurement of Service Providers/ Contractors etc.	3 Years
Construction of Pipelines/WTP/ Reservoirs etc.	4 Years
Commissioning of Overall Scheme	1 Year

NB. Many of the processes are influenced by external factors

11 NEXT STEPS

The next steps for the progression of the project to completion of formal planning are as follows:

1. The Plan:

- Briefing of all relevant stakeholders and making the Non Technical Summary available to the public via the project website www.watersupplyproject-dublinregion.ie
- Publication of the Adopted Plan & SEA Statement (complete SEA process)

2. Preparation of an Application to An Bord Pleanála:

- The ultimate decision requires approval from An Bord Pleanála.
- To get to this stage further more detailed studies must be completed which include Environmental Impact Assessment (EIA) and further formal public consultation.

3. Await Outcome of An Bord Pleanála:

- An Bord Pleanála will make their decision based on the findings of EIA, Public Consultation and Oral Hearings