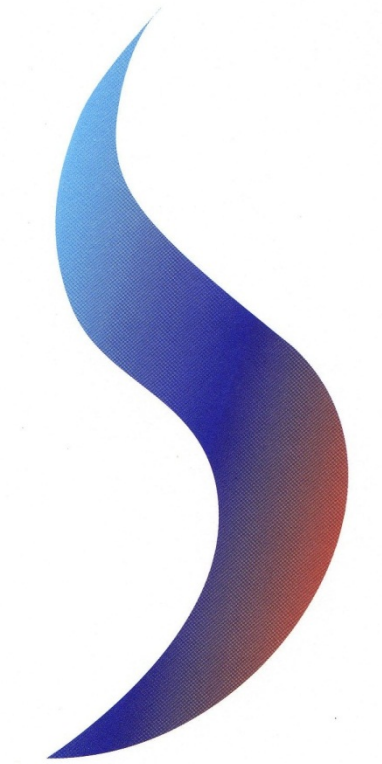
2015 Drought Plan

SEA Screening Report

July 2015



In this SEA screening report, we have reviewed the drought options developed within the main report of our drought plan and assessed their potential impact on the environment. From our review we have determined that none of the options which are proposed are likely to have any adverse effects.

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1 INTRODUCTION

1.1 Background

Dee Valley Water (DVW) Plc supplies over 64 million litres of water per day to a population of over a quarter of a million people. Our water supply area (the Supply Area) covers parts of north-east Wales and north Cheshire. An outline of the Supply Area is shown in Figure 1.

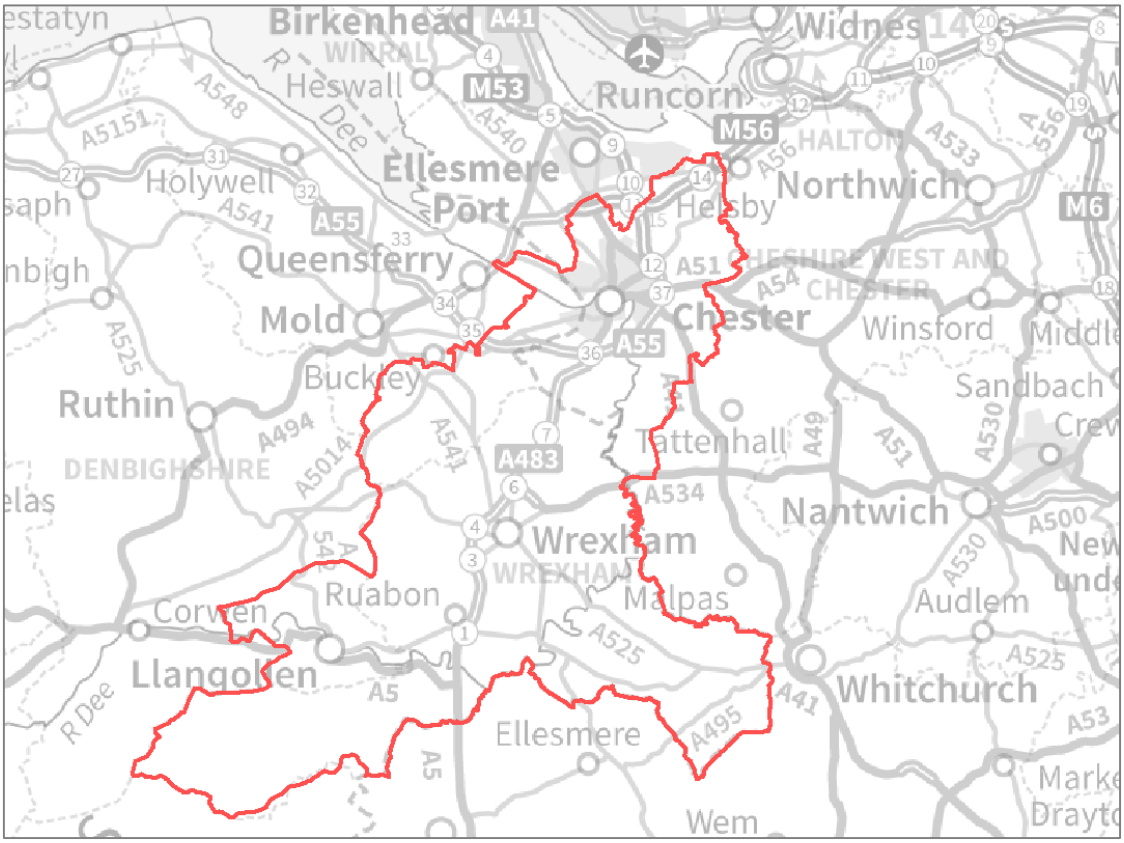


Figure 1: Dee Valley Water supply area

Under Sections 39B and 39C of the Water Industry Act 1991, as amended by the Water Act 2003, we are legally required to prepare and maintain a Drought Plan. Drought plans are updated every three and a half years (or earlier if necessary). The Drought Plan sets out how we will "continue, during a period of drought, to discharge our duties to supply adequate quantities of wholesome water, with as little recourse as reasonably possible to drought orders or drought permits".

The adoption of Directive 2001/42/EEC on the assessment of certain plans and programmes on the environment made it a legal requirement for competent authorities preparing certain plans or programmes to undertake a Strategic Environmental Assessment (SEA). Guidance set out in the UKWIR document *Strategic Environmental Assessment and Habitats Regulations Assessment – Guidance for Water Resources Management Plans and Drought Plans (2012)* recognises that Drought Plans may be subject to SEA. The requirement to undertake a statutory SEA will be dependent on the nature of the Drought Plan and hinges on the likelihood that the Drought Plan has the potential to have a significant environmental effect.

This SEA Screening Report considers the current status of the DVW Drought Plan in preparation and provides information to determine whether there is a requirement to undertake statutory SEA.

1.2 Drought Plan

Because each drought is different in terms of the duration, location, severity and impact; the Drought Plan reflects this by including a range of possible options in response to a drought. The available options may be implemented in a variety of different ways and at different times; making it very difficult to accurately predict the options or combination of options that will be implemented and their combined impact on the environment.

The key steps that we have taken in preparing our Drought Plan are shown in Figure 2.

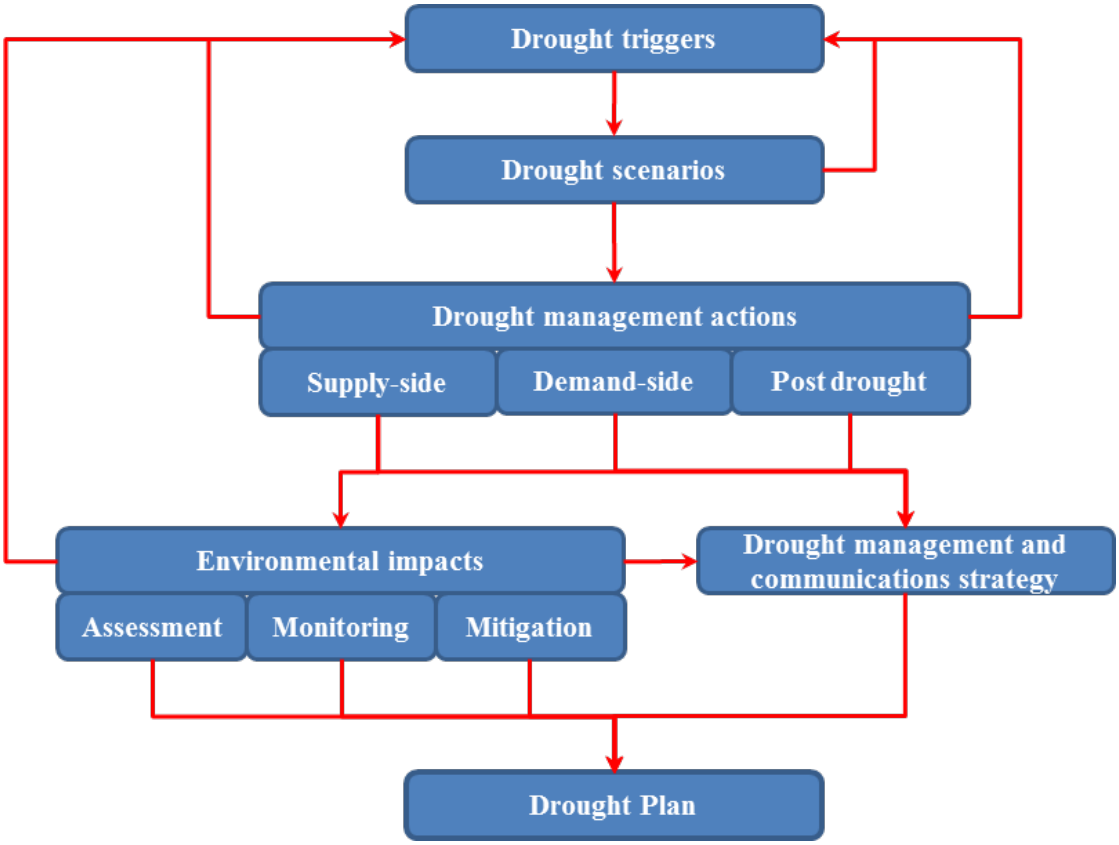


Figure 2: Drought Plan development process

1.3 Strategic Environmental Assessment

1.3.1 Overview

SEA became a statutory requirement following the adoption of Directive 2001/42/EEC on the assessment of effects of certain plans and programmes on the environment (the SEA Directive).

The objective of the SEA Directive is:

> *"to provide for a high level of protection of the environment and to contribute to the integration of environmental considerations into the preparation and adoption of plans and programmes with a view of contributing towards sustainable development."*

As plans, policies or programmes develop, SEA aims to identify the associated environmental effects in order to avoid, manage or mitigate significant environmental impacts.

The SEA Directive was transposed in the UK by the following sets of Regulations:

- The Environmental Assessment of Plans and Programmes Regulations 2004 (Statutory Instrument 2004 No.1633)
- The Environmental Assessment of Plans and Programmes (Wales) Regulations 2004 (Welsh Statutory Instrument No.1656 (W.170))
- The Environmental Assessment of Plans and Programmes (Scotland) Regulations 2004 (Scottish Statutory Instrument No.258)
- The Environmental Assessment of Plans and Programmes (Northern Ireland) Regulations 2004 (Statutory Rule 2004 No.280)

1.3.2 Applying the Strategic Environmental Assessment to Drought Plans

Article 1 of the SEA Directive requires "*an environmental assessment…of certain plan and programmes which are likely to have significant effects on the environment*"

Plans and programmes are defined in Article 2(a) of the SEA Directive as those which:

- Are subject to preparation and/or adoption by an authority at national, regional or local level or which are prepared by an authority for adoption, through a legislative procedure by Parliament or Government; and
- Are required by legislative, regulatory or administrative provisions.

Drought Plans are included as plans which require a SEA in Article 2(a) of the SEA Directive as:

- European Commission guidance (European Commission, 2003) states that in preparing long term management plans for ensuring water resources, privatised water companies can be considered an authority because they are providing services which would be carried out by public authorities in a non-privatised scheme; and
- The preparation of a Drought Plan is a statutory requirement under the Water Act 2003.

Plans and programmes that may have significant effects on the environment are identified in Article 3 of the SEA Directive as those:

- "which are prepared for…water management…and which set the framework for future development consent of projects listed in Annexes I and II of Directive 85/337/EEC (The Environmental Impact Assessment Directive), or
- which in view of the likely effect on sites, have been determined to require an assessment pursuant to Article 6 or 7 of Directive 92/43/EEC (the Habitats Directive)"

UKWIR guidance sets out guidelines for the consideration of whether an SEA is required for specific Drought Plans. Figure 3 outlines the criteria relevant to the determination that a SEA is required for a Drought Plan. The path through the diagram that we believe is applicable to this Drought Plan is highlighted in red.

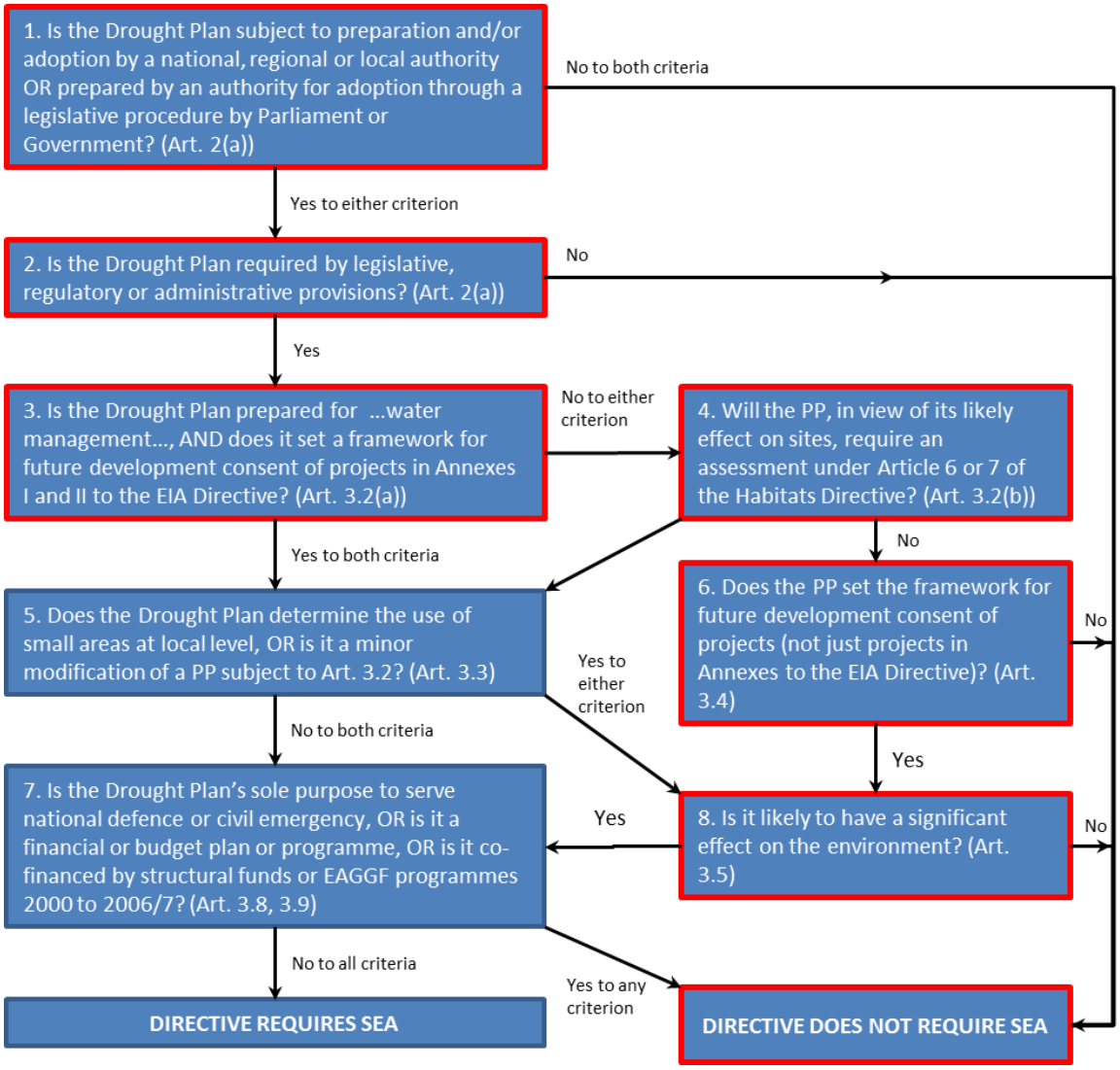


Figure 3: Application of the SEA directive to Drought Plans

1.3.3 Provision for consultation

Under the provisions of the SEA Regulations in England and Wales, we are required to obtain a screening opinion from the statutory consultees with regard to significance

of the Drought Plan's environmental effect. The regulations set out the following designated consultation bodies for England and Wales:

- England: Countryside Agency, English Heritage, English Nature, and the Environment Agency
- Wales: Cadw (Welsh Historic Monuments) and Natural Resources Wales

Following consultation with the designated consultees, we will make a determination as to whether SEA is required. The determination will be sent to the statutory consultees and be made publicly available within 28 days. The determination must be accompanied by a statement of reasons. The determination and Drought Plan will be subject to review by the Secretary of State and the Welsh Government at any time.

1.3.4 Structure of the screening report

The structure of this screening report is shown in Table 1.

Section	Description
1 Introduction	Sets out the purpose and structure of the Screening Report, provides background information on the Drought Plan development process and outlines the requirements of the SEA Directive.
2 Review of relevant plans and programmes	A description of other plans and strategies which may influence, or be influenced by the Drought Plan.
3 Environmental baseline	An outline description of the relevant environment in the study area covering biodiversity; human beings; soil, geology and land use; water; air and climate; material assets; archaeology and cultural heritage; and landscape and visual amenity.
4 Ecosystem services	An outline of the ecosystem services which we rely upon.
5 Assessment of drought options	A summary of the key drought options developed within the drought plan and a description of the screening report. An assessment of the drought options with respect to the SEA objectives.
6 Monitoring and mitigation	Additional monitoring and mitigation measures that will be carried out during a drought to avoid any environmental issues developing.
7 Conclusions	Conclusions of the screening report and recommendations

Table 1: Structure of the screening report

2 REVIEW OF RELEVANT POLICIES, PLANS AND PROGRAMMES

In considering the potential effects of the Drought Plan, SEA requires the consideration of other plans and programmes in order to:

- Highlight existing environmental constraints relevant to the Supply Area
- Identify the environmental objectives of other policies, plans and programmes to which the development of the Drought Plan should have some regard
- Identify potential environmental effects of other policies, plans and programmes which may have the potential to have in combination effects when considered alongside the effects of the Drought Plan

The information from the reviewed policies, plans and programmes has been used in later sections of this document to collate environmental baseline information, identify the key messages, determine mitigation measures and ascertain if any further assessments are required.

The policies, plans and programmes were sourced at a local, regional, national and international level and were selected for their relevance to either the Drought Plan or to Dee Valley Water. A full list of sources of information for the SEA is provided in Table 2. The key messages identified from the review are given in Table 3, these have been used to assist in the development of the SEA objectives which the drought management options have been reviewed against.

Policies and Plans Reviewed
European Commission, Birds Directive (2009/147/EC)
European Commission, Animal health requirements for aquaculture animals and products thereof, and on the prevention and control of certain diseases in aquatic animals (2006/88/EC)
European Commission, The Water Framework Directive (2000/60/EC))
European Commission, Marine Strategy Framework Directive (2008/56/EC)
Ramsar Convention (1971), The Convention on Wetlands of International Importance
European Commission, Habitats Directive (1992/43/EEC)
Cadw, Countryside Council for Wales and ICOMOS (UK)(International Council on Monuments and Sites) (2001), Register of Landscapes of Historic Importance
English Heritage, The National Heritage List for England
English Heritage, English Heritage's Heritage at Risk National Strategy 2011-2015
Welsh Government, Historic Environment Strategy for Wales
UK National Ecosystems Assessment, Understanding nature's value to society, Syntesis of the Key Findings, 2011
Defra, Eel Management plans for the United Kingdom, Overview for England and Wales, March 2010
Defra, Biodiversity 2020, A strategy for England's wildlife and ecosystem services, 2010
Defra, Making Space for Nature: A review of England's Wildlife Sites and Ecological Network, September 2010
Defra, Drought permits and drought orders, May 2011
Environment Agency, Water for people and the environment, Water resources action plan for England and Wales, March 2010
The Water Act, 2003
The Conservation of Habitats and Species Regulations, 2010 (as amended by the Conservation of Habitats and Species (Amendment) Regulations, 2011 and 2012)
Wales Biodiversity Partnership Section 42 Species and Habitats of Principle Importance to Wales
Welsh Assembly Government, State of the Environment Report – Wales, 2012
Natural Resources Wales, Drought Plan, January 2012

Policies and Plans Reviewed
Environment Agency (2007) River Dee Catchment Flood Management Plan: Consultation Document
Environment Agency - River Basin Management Plan, Dee river basin district Main document Dec 2009
Dee Catchment Salmon Action Plan, December 1997
Natural Resources Wales, Dee CAMS, February 2013
Wrexham Local Development Plan 2013-2028
Cheshire West and Chester Local Plan (Draft)
United Utilities, Drought Plan, 2013
Severn Trent, Draft Drought Plan,2013
Albion Water, Draft Drought Plan, 2006
Natural Resources Wales, Dee General Directions, April 2009

Table 2: Policies, Plans and Programmes reviewed

SEA Topic	Key messages
Biodiversity	Protection and enhancement of biodiversity, particularly designated sites such as Ramsar, SACs, SPAs and SSSIs.
	Avoidance of activities that may cause loss of biodiversity.
	Follow and promote a catchment approach to ensure better protection of the environment and natural resources.
	Consideration of the ecosystem services which are relied upon and how best to protect and preserve them.
Human beings	Water resources are key recreational assets providing numerous benefits to health and wellbeing, local economies, sports and leisure amongst others.
	Issues relating to water availability and water demand are becoming key issues to the development of certain areas.
	Promotion of the sustainable use of natural assets.
Soil, geology and land use	Ensure that the soil and geology is protected from damaging development or practices.
Water	Provide a reliable and wholesome supply of water.
	Ensure appropriate management of abstraction to maintain healthy resources.
	Consider the interaction of the various drought management actions proposed by neighbouring water companies.
Air and climate	Minimise the impact of climate change.
	Minimise activities which result in the release of greenhouse gases or contribute to other forms of air pollution.
	Improve overall air quality.
	Minimise energy consumption, support the use of sustainable/renewable energy.
Material assets	Maintain a reliable supply of water for both domestic and non-domestic customers.
Archaeology and cultural heritage	Protect the nation's archaeological and cultural heritage and minimise activities which may cause adverse effects.
Landscape and visual amenity	Protect and further enhance the value of local landscapes and the countryside in general.
	The countryside is subject to a number of general development pressures.

Table 3: Key messages from the policy, plan and programme review

3 ENVIRONMENTAL BASELINE

3.1 Biodiversity

Biodiversity is the variety of animals and plants that exist within in an area along with their associated habitats. Preserving and improving biodiversity is recognised on a range of levels from national down to local as it provides many of the things that sustain our lives.

Biodiversity is the source of many ecosystem goods that we rely on for our day to day lives. Changes in biodiversity can influence the supply of provisioning, regulating and cultural ecosystem services which our survival depend upon.

Within our supply area there are:

- 27 Sites of special scientific interest (SSSIs)
- 1 Special protection areas (SPA's)
- 4 Special areas of conservation (SACs)
- 1 Ramsar sites
- 1 National nature reserves (NNRs)
- 1 Local natural reserves (LLNR)
- 1 Area of outstanding natural beauty (AONBs)
- 1 Park, garden or country park

Maps showing the extent of the above sites are given in Appendix A – Designated conservation sites and woodland areas.

Appendix B – provides details of the European Conservation Areas and their relevance to the Drought Plan.

We extract water from the River Dee at Chester (Barrelwell Hill) and Sesswick intake sites. The River Dee is designated as a Special Area of Conservation (SAC) (as part of The River Dee and Lake Bala SAC) and is designated primarily for the protection of:

- Atlantic salmon (*Salmo salar*)
- Floating water plantain (*Luronium natans*)
- Watercourses of plain to montane levels with *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation.

River (*Lampetra fluviatilis*), brook (*Lampetra planeri*) and sea lamprey (*Petromyzon marinus*), otter (*Lutra lutra*) and bullhead (*Cottus gobio*) are also qualifying features of the site.

Natural Resources Wales have undertaken a review of the licences and permissions which could affect the above European and national designated sites through a process called the Review of Consents (ROC). From the ROC, the integrity of the River Dee and Bala Lake SAC was identified as being at risk from fish entrainment, due to the river abstractions carried out by ourselves (amongst other companies). As a result of this in April 2006 we commissioned a fish entrainment study (jointly with United Utilities and Dwr Cymru/Welsh Water) to assess the significance of the level

of entrainment of salmon at our intakes from the River Dee, the findings of the survey showed that no action was required at our intakes.

Since then *The Eels (England and Wales) Regulation 2009* have set out additional duties to provide appropriate screening to reduce the loss of eels from their natural environment. In agreement with Natural Resources Wales and the Environment Agency, we plan to undertake eel surveys at our intakes on the River Dee during 2016/17 in a joint study with United Utilities and Dwr Cymru to assess the level of entrainment. The output from the study will determine whether improvements to the screening structures will be required.

The River Dee is recognised as one of north Wales' premier rivers for Atlantic salmon.

In addition to the River Dee and Bala Lake SAC, there are four further SACs within the Supply Area, including Johnstown which is designated for its populations of great crested newts. Llyn Cyfynwy reservoir, operated by us, is located on the northern edge of the Berwyn and South Clwyd Mountains SAC which lies adjacent to the boundary of the Supply Area. The interesting features of this SAC are blanket bogs, heaths and fenlands.

Midland Meres and Mosses Ramsar site consists of numerous wetland sites considered to be "internationally important wetlands" for protected bird species. These are also cited as supporting a number of rare nationally important plants and invertebrates.

There are 27 Sites of Special Scientific Interest (SSSI) within or partially within the Supply Area including the River Dee (England) SSSI and the Afon Dyfrdwy (River Dee - Wales) SSSI (hereafter referred to as the River Dee SSSI).

Appendix D – Sites of Special Scientific Interest lists the SSSI within the supply area and their relevance to the Drought Plan. We abstract water from the River Dee SSSI. The citation for the River Dee SSSI considers abstraction to be an activity which threatens the integrity of the SSSI through alterations in water levels, however, this is controlled and mitigated by consents and licences issued by the Natural Resources Wales.

The River Dee and surrounds support a number of priority habitats (e.g. lowland bog, wet woodland, reedbed and unimproved grassland) and species (e.g. great crested newt, allis and twaite shad, water vole, otter, white clawed crayfish and lesser horseshoe bats) listed in the local and National Biodiversity Action Plans.

3.2 Human beings

3.2.1 Population and housing

We supply water to over a quarter of a million people in the area of North East Wales and Chester. We undertook a Population and Dwelling Review for our Water Resources Management Plan to produce a comprehensive review and forecast of the

population and number of households within the Supply Area. We consulted with various local councils and government bodies to obtain a measure of projected population increases.

The population is predicted to rise by 0.36%[1] each year over the next 25 years, with a potential increase in the number of households in the Supply Area of 0.74% per year over the next 25 years. There are some uncertainties in relation to the population and properties projections for the Wrexham Resource Zone due to new population forecasts released by the Welsh Government in June 2013.

The Environment Agency has undertaken a River Basin Management Plan of the Dee River Basin District which incorporates the entire River Dee from its upper reaches in the mountains of Snowdonia to the River Dee Estuary. The Supply Area is included within the Dee River Basin District.

The population in the river basin district will continue to increase, with further urbanisation. Agriculture in the region will respond to the changing climate, market conditions, financial incentives and regulatory pressures. Technology and other solutions to address the pressures will improve, but the rate at which some new solutions can be introduced will depend on the economic climate[2].

3.2.2 Infrastructure

Chester and Wrexham are the two large urban centres within the Supply Area. Chester is the administrative centre for Cheshire and is a major retail centre. Chester also boasts a host of tourist attractions including Chester Zoo, Roman and Medieval architecture and the city walls.

Wrexham has developed into the principal urban centre in North Wales. It is now a major centre for shopping and commerce and it also accommodates the Plas Coch Campus of the North East Wales Institute. It also has a strong manufacturing employment sector with Wrexham Industrial Park, one of the United Kingdom's largest industrial parks, being home to many manufacturing and technology businesses.[3]

3.2.3 Health

Cheshire West and Chester is a comparatively affluent area. However, fuel poverty is above the regional average and whilst overall the borough scores comparatively well on the Index of Multiple Deprivation, Cheshire West and Chester does have some of the worst areas of deprivation in the country, measured at Lower layer Super Output Area (LSOA) level. Thirty LSOA's (14%) in Cheshire West and Chester were within the bottom 20% nationally. The areas of deprivation identified are predominantly urban, and close to the centres of major urban areas within the Borough.[4]

[1] Executive Summary - Dee Valley Water - Water Resources Management Plan Dec 2013
[2] Page 38 EA River Basin Management Plan, Dee river basin district Main document Dec 2009
[3] Wrexham provisional local area profile April 2010
[4] Cheshire West and Chester Local Development Framework – Sustainability appraisal scoping report

The Welsh Index of Multiple Deprivation 2008 ranks specific small areas in Wales in terms of deprivation. In Wrexham, 11 per cent of areas fall in the 10% most deprived areas in Wales and overall a slight majority of its areas are less deprived than the Wales average. Welsh Health Survey results for 2003-07 showed that, around 25 per cent of adults in Wrexham reported that they currently smoke and 38 per cent reported drinking more than the daily guidelines on at least one day in the past week. The equivalent figures for Wales were 26 per cent and 36 per cent respectively.[5]

3.2.4 Economy

The Economy within the Supply Area is dominated by tourism, business services, retailing, banking and insurance. Commercial and industrial development is mainly located around Chester and Wrexham. Major industries in the area include chemical and pharmaceutical plants, food manufacture, paper production, shipping and transport at the port of Mostyn and a major aircraft-construction site at Broughton. Agriculture makes up only a very small part of the economy, with cereal crops and livestock being the largest agricultural activities.[6]

3.2.5 Recreation

The River Dee is an important recreational feature providing facilities for angling, canoeing, kayaking, sailing and bathing. There are networks of footpaths along the River Dee which are in frequent use by walkers and cyclists.

We consulted Cheshire and Chester Council and Wrexham County Borough Council during the preparation of our Water Resources Management Plan to identify any proposed large water using developments. Neither Cheshire West and Chester Council nor Wrexham County Borough Council were aware of any at the time. Since this consultation a potential power station and prison have been identified for the Wrexham area.

3.3 Soil, Geology and Land Use

Soil

The dominant soil types in the Supply Area are described by Cranfield Soil and Agrifood Institute[7] as:

- Slowly permeable seasonally wet, slightly acid but base-rich, loamy clayey silts; found in seasonally wet pastures and woodlands
- Freely draining acid loamy soils over rock; found in steep upland acid pastures, dry heath and moor, bracken, gorse and oak woodlands.

[5] National Assembly for Wales – Key Statistics for Wrexham 2010
[6] Defra - Making space for water: taking forwards a new government strategy for flood and coastal erosion risk management in England March 2005
[7] http://www.landis.org.uk/soilscapes2/index.cfm

Geology

The dominant drift geology in the Supply Area is boulder clay with scattered areas of alluvium, glacial sand and gravel and brick clay.

Natural Resources Wales produced a Catchment Abstraction Management Strategy for the River Dee which identified Water Resource Management Units, characterised by assessments of the surface and groundwater availability along the entire river. Water Resource Management Units one and two include the Supply Area. One covers the surface waters of the whole River Dee from Snowdonia to the Dee Estuary. Two covers an irregular block of bedrock from Backford to Ellesmere. Two consists, of predominantly Permo-Triassic sandstones which are capable of holding significant amounts of groundwater.

Land Use

Land use ranges from open areas, sparsely populated rural areas to thriving towns with growing populations which are concentrated on the low-lying coastal plains of the River Dee. There are significant areas of urban and suburban development, heavy industry, open cast mines and areas of mineral abstraction. The land surrounding the River Dee supports mixed intensive dairy farming and arable production. Reforms in the Common Agricultural Policy are leading to shifts towards more extensive farming systems and more land is predicted to enter Environmental Stewardship Schemes in England and Glastir in Wales in the future.

The Agricultural Land Classification System developed by Defra provides a method for assessing the quality of farmland, principally for the use in planning. The system divides the quality of land into five categories as well as non-agricultural and urban. 81.1% of the agricultural land in Cheshire is classified as good/moderate to very good in comparison with the 52.4% national figure (Table 4). Information relating to the classification of land in Wales was not available.

Agricultural Land Classification	Cheshire County	England
Grade 1 – Excellent	0%	2.7%
Grade 2 – Very good	10.8%	14.2%
Grade 3 – Good/moderate	70.3%	48.2%
Grade 4 – Poor	8.8%	14.1%
Grade 5 – Very Poor	3.2%	8.5%
Non agricultural	0.7%	5.0%
Urban	6.3%	7.3%

Table 4: Agricultural land classification for Cheshire

3.4 Water

3.4.1 Water resources

The strategic importance of the River Dee and the risk posed to it from pollution associated with the adjacent manufacturing industries in the lower Dee and estuary have led to the Dee becoming one of the most regulated rivers in Europe. In 1999, the lower part of the Dee was designated as the UK's first Water Protection Zone. This allows for greater controls on polluting activities, placing greater emphasis on

industry and others to put in place pollution control measures (The Water Protection Zone (River Dee Catchment) Designation Order 1999)[8].

The River Dee is one of the largest lowland rivers used for public water supplies in England and Wales. It provides drinking water to more than 2 million people in North East Wales, Cheshire and Merseyside. Groundwater is also abstracted for public water supply and industrial use. The flow of the River Dee is heavily regulated with 16% of the catchment area and 33% of the run-off controlled by the regulating reservoirs. This allows for the continual supply of water for residential, agricultural and industrial purposes, whilst ensuring that there is enough in-channel flow to maintain healthy flora and fauna communities and the passage of migratory fish.

As required by the Water Framework Directive, the River Dee and its catchment area is managed though a River Basin Management Plan, which has been produced by the Environment Agency. The Plan also includes information relating to the water resources in the area. The River Basin Management Plan describes the river basin district, and the pressures that the water environment faces. It shows what this means for the current state of the water environment, and what actions will be taken to address the pressures. It sets out what improvements are possible by 2015 and how the actions will make a difference to the local environment – the catchments, the estuaries and coasts, and the groundwater[8].

Regulation by the reservoirs has increased low flows and decreased high flows. One effect of the regulation on the river is the change in channel geometry. The channel has narrowed, but the channel capacity has been maintained through an associated increase in depth.

We hold abstraction licenses for supply to the Chester and Wrexham Resource Zones. In both the Chester and Wrexham Resource Zones, the River Dee is the principal source of water. In Wrexham, there are additional upland reservoir sources and a spring. In Chester, the only additional source is a borehole located in the Mickle Trafford area, near Chester.

3.4.2 Water availability

Natural Resources Wales River Dee Catchment Abstraction Management Strategy (CAMS) provides an overview of catchment water resource availability within the Supply Area and for some adjoining water supply areas not under our operation. The River Dee CAMS splits the catchment into four component Water Resource Management Units. The present and future target status of the Water Resource Management Units is presented in Table 5 and Table 6.

[8] Water for life and livelihoods River basin planning: summary of significant water management issues Dee River Basin District

Catchment	More water available?	Catchment	More water available?
Aldford Brook	No	Clywedog	No
Alwen	No	Dee (source to Chester Weir)	No
Alyn	No	Pulford Brook	No
Ceiriog	No	Worthenbury Brook	No

Table 5: Availability of water for abstraction in the main catchments of the River Dee

Groundwater Unit	More water available?	Groundwater Unit	More water available?
Aldford and Peckforton Unit	No	Dee Estuary and Wirral Unit	No
Chester Block	Yes with restriction	Middle Dee Unit	Yes with restriction

Table 6: Availability of water for abstraction from ground water sources in the Dee catchment

The Dee Catchment CAMS sets out a future strategy for the renewal of existing time-limited abstraction licences and consideration of new applications for licensed abstractions. None of our abstraction licenses source water from Water Resource Management Units considered to be over licensed, whilst the provisions of the Dee Catchment CAMs should allow us to abstract up to their present abstraction limits within Water Resource Management Units 1 and 2, during non-drought periods, without undue pressure on water resources in these areas.

Information relating to water resources is part of the Dee River Basin Management Plan which has been produced by the Environment Agency as part of the Water Framework Directive.

3.4.3 River water quality

Based on the most recent assessment of the ecological status of water bodies, Table 7 shows the percentage of water bodies within the Dee river basin that are achieving good or better ecological status along with the most significant environmental pressures that need to be addressed.

Surface Water (% of water bodies at good ecological status/potential)[9]		Ground Water (% of water bodies at good ecological status/potential)[10]		Significant Pressures[11]
2010	2015	2010	2015	
28	37	83	76	Pesticides Invasive non-native species Phosphates Nitrates Urban and transport pollution Sediment Other pollutants – metals Commercial Fisheries (shell fish)

Table 7: Assessment on the current and potential ecological status of the Dee river basin district

[9] https://www.environment-agency.gov.uk/static/documents/Research/Classification_objectives_for_WFD_cycle_1.xls (accessed September 2013)

[10] https://www.environment-agency.gov.uk/static/documents/Research/Groundwaterclassification_objectives_WFDcycle1.xls (accessed September 2013)

[11] http://a0768b4a8a31e106d8b0-50dc802554eb38a24458b98ff72d550b.r19.cf3.rackcdn.com/gewa0910bsqj-e-e.pdf

Water quality of the River Dee is generally good and improving. Biological and chemical water quality is recorded at various locations throughout the Supply Area by the Natural Resources Wales. Samples taken from the middle and upper show that water quality is generally good.

	Biological	Physico Chemical	Pollutants
Chester Weir to Ceiriog	Moderate	Good	High
Ceiriog to Alwen	Good	High	Moderate

Table 8: Biological, chemical and pollutant[12]

Water quality along some sections of the river is adversely affected by pollution from Waste Water Treatment Works, industrial discharges, agricultural activities, urban runoff and acidification (i.e. from mine adits and forestry operations). All Water Treatment works and Waste Water Treatment Works operate under consents to discharge water issued by the Natural Resources Wales. Consents specify the discharge location, total volume of water permitted and the quality conditions of the discharged water.

3.4.4 Drinking water quality

We take water samples from treatment works, service reservoirs and customers taps throughout the Supply Area to check the quality of the water against the requirements in the Water Supply (Water Quality) Regulations 2010. During 2013 we carried out 30,442 tests on the treated water and had an overall compliance index score of 99.93%.

3.5 Air and Climate

3.5.1 Air quality

Air quality is generally good within the Supply Area, however there are two small Area Quality Management areas in Chester shown in Table 9.

AQMA	Description	Pollutants
Chester AQMA	An area encompassing the triangle formed by the junction of Tarvin Road (A51), Christleton Road (A5115) and Challinor Street.	Nitrogen dioxide NO_2
Whitby Rd/Station Rd AQMA	An area incorporating residential properties on Whitby Road (between Enfield Rd and Cromwell Rd);	Nitrogen dioxide NO_2

Table 9: AQMAs Declared by Cheshire West and Chester Council[13]

3.5.2 Climate change

Climate change may result in higher flood risk. Increased flood risk has potential implications for water supply assets located in floodplain areas and consequently the security of public water supply.

[12] http://maps.environment-agency.gov.uk (accessed January 2014)
[13] http://aqma.defra.gov.uk/aqma/local_authorities.php?la_id=446 (accessed January 2014)

Climate change could also lead to variations in water supply and demand, e.g. temperature increase and changes to rainfall patterns are predicted which may lead to an increase in the frequency and duration of drought events, associated with evaporative losses and seasonally reduce rainfall run-off to watercourses.

Climate change is likely to result in warmer temperatures, wetter winters and dryer summers. Within our Water Resources Management Plan we have allowed for a reduction in the water available for abstraction, due to climate change, of 1.3Ml/d from our Chester Resource Zone, over the period up to 2035.

In addition to this, the Water Resources Management Plan incorporates target headroom which includes small increases throughout the planning period to account for climate change; the demand forecast variation and, the uncertainty of climate change on demand.

3.6 Material assets

We operate six Water Treatment Works (Plemstall, Boughton, Llwyn Onn, Legacy, Pendinas and Oerog) and eight upland reservoirs, three supplying the Pendinas Water Treatment Works and five supplying the Legacy Water Treatment Works in the Wrexham Resource Zone. The largest Water Treatment Works is Llwyn Onn in Wrexham which is supplied by water abstracted at Sesswick from the River Dee. Both our Llwyn Onn and Boughton Water Treatment Works have recently undergone refurbishment.

The M53 runs north of Chester and joins the M56 which connects Chester to Manchester and Liverpool. The M56 also has links to the M6 running north-south through England and the M62 running west-east. West of Chester is the A55 which is the main trunk road across north Wales. The A483 links Chester to Wrexham and connects to the A5 which runs across Wales.

The main railway lines run from Chester to Holyhead, and regular local connections are available linking Chester and Wrexham to Manchester, Liverpool and Crewe.

There are no large airports within the Supply Area. Liverpool and Manchester airports are easily within commutable distance and Hawarden airport serves as the base for Airbus.

3.7 Archaeology and cultural heritage

Appendix B – Archaeology and cultural heritage shows the locations of scheduled ancient monument sites in relation to the Supply Area, of which there are 191.

The city of Chester has had a distinguished history since the late 1st century AD, when the Roman Empire established the fort of Deva and port where the city crossed the River Dee. Deva became a major garrison during the Roman occupation of Britain due to its position on the Welsh border and its large harbour creating a key strategic outpost. The city retains most of its original Roman grid structure and city

walls. Within the walls the centre has remained compact and is characterised by the distinctive black and white architecture of its half-timber rows. Many of the buildings within Chester are designated as Scheduled Monuments.

Wrexham was known for its leather industry in the 18th Century and it grew rapidly during the industrial revolution being one of the period's pioneering cities. Industry in the area declined during the depression periods in the late 20th Century with the area losing its coal mines, brickworks and then its steel works in the 1980s.

3.8 Landscape and visual amenity

The area surrounding the River Dee comprises a variety of landscapes and settlements reflecting its history and development. Settlements include small villages and farming communities as well as larger towns and developed centres namely the ancient military stronghold of Chester and the historic market town of Wrexham. The passage of the River Dee has created the Cheshire Plains and undulating hills in the region.

The county of Wrexham has a truly diverse landscape shaped by a combination of the underlying geology, agriculture, forestry, its industrial past and the employment needs of its communities. It has, as part of the "Welsh Borderland", a landscape which reflects the often turbulent interaction between the English and Welsh cultures for example, Offa's Dyke.

The Register of Landscapes of Special Historic Interest in Wales identifies the Vale of Llangollen, Eglwyseg Mountains and the Maelor region of Wrexham County as being of national importance, due to the preservation of previous land uses.

3.9 Summary of baseline conditions

A summary of the above environmental baseline conditions is given in Table 10 below.

Environmental characteristic	Baseline condition
Biodiversity	The River Dee and Bala Lake SAC is designated primarily for the protection of Atlantic salmon, floating water plantain and watercourses of plain to montane levels with Ranunculion fluitantis and Callitricho-Batrachion vegetation. Llyn Cyfynwy, Pen-y-Cae reservoirs are both on the edge of the Berwyn and South Clwyd Mountains SAC/SPA which is designated under the SAC classification primarily for the protection of Dry Heaths and Blanket Bogs and under the SPA classification for the Hen Harrier, Merlin, Peregrine and Red Kite. At present our abstraction arrangements from the River Dee within the SAC are not considered to pose a significant risk to designated fish populations within the Supply Area
Human beings	The population is predicted to rise by 0.36% each year over the next 25 years, with a potential increase in the number of households of 0.74% per year in the Supply Area. The general health of the supply area is above average with Chester performing comparatively will on the Index of Multiple Deprivation, with Wrexham ranked slightly above the Welsh average. The main drivers of the economy within the Supply Area are tourism, business services, retailing, banking and insurance. Commercial and industrial development is mainly concentrated around the urban centres of Chester and Wrexham. Agriculture is only a small part of the economy. The River Dee is an important recreational feature providing facilities for angling, kayaking, sailing and bathing.
Soil, Geology and Land Use	The two dominant soil types in the region are slowly permeable loamy, clay silts and freely draining acid loamy soils. The dominant drift geology in the Supply Area is boulder clay. There is a large area of Permo-Triassic Sandstone within the Supply Area which is capable of holding significant amounts of groundwater. Land use varies from open area and sparsely populated rural villages to expanding cities. The largest area of land use associated with water supply is given over to eight upland reservoirs in the west of the Supply Area.
Water	Water quality is considered to be generally good throughout the Supply Area. Surface water and groundwater resources are not presently subject to over abstraction from the River Dee or within the aquifers associated with the Chester and Middle Dee, both of which coincide with the Supply Area. The percentage of surface water bodies and ground water bodies which achieved good ecological status was 28% and 83% respectively in 2010. Water quality of the River Dee is generally good and improving based on samples taken from the middle and upper regions.
Air and Climate	Air quality is generally good within the supply area. There are two small Area Quality Management areas in Chester. Climate change could lead to variations in the water available for supply and demand for water. Climate change may result in higher flood risk. Increased flood risk has potential implications for water supply assets located in floodplain areas and consequently the security of public water supply.
Material Assets	We operate six Water Treatment Works and eight upland reservoirs There are several trunk roads and railway lines in the region which link Chester and Wrexham to England and Wales. There are no large ports or airports.
Landscape and Visual Amenity	The landscape and visual amenity of the Supply Area is shaped by the River Dee and its industrial past.

Table 10: Summary of environmental baseline conditions.

4 ECOSYSTEM SERVICES

As a water company we depend on a clean and reliable supply of water from our resources and therefore rely on the ecosystem services and the supporting green infrastructure to provide us with this. Figure 4 shows how ecosystem services contribute to our well-being, the aspects that we rely on most heavily are the provisioning services for our supply of water and the regulating services for the quality of our water.

Figure 4: How ecosystems services contribute to well being[14]

As part of our most recent business plan which covers the period 2015-2020 we are proposing a number of projects/measures which will benefit the ecosystem services that we rely upon, these include:

[14] http://www.ccgc.gov.uk/landscape--wildlife/managing-land-and-sea/idoc.ashx?docid=2593b500-1c77-4b83-ba80-120de6689768&version=-1

- Legacy Water Treatment Works hydropower scheme – As part of the rebuilding of our Legacy Water Treatment Works we plan to install a hydro power scheme. This scheme will capture the energy from the water that is being supplied from the Ty Mawr upland reservoir and convert it into electricity.
- Pressure Reducing Valve Installation – We are looking to install additional PRVs in our network with the aim of reducing peak operating pressures and pressure fluctuations. The benefits of additional PRVs will include: extended asset life of our pipe network and reduced leakage and therefore reduced abstraction.
- Pump optimisation – We will be trying to optimise how we move water around our network using pumping stations. Minimising the use of pumping stations will reduce electricity consumption and possibly reduce pressure in some areas.

5 ASSESSMENT OF DROUGHT OPTIONS

5.1 Drought options

Within our Drought Plan we have identified a range of drought options which we will implement in the event that a drought occurs. The implementation of the options are dependent on specific triggers being reached, these triggers have been detailed in the main report. The drought options that have been proposed are:

- Increased water efficiency promotion – Enhance normal promotional activities using newspaper adverts and targeted water efficiency messages.
- Increased leakage detection and repair activity – Increase the number of resources working on leakage detection and repair activities with the aim of conserving water through leakage reduction.
- Water use restrictions – Reducing the demand for water through either voluntary water use restrictions or temporary use bans.
- Implementation of ordinary drought orders – Further reducing the demand for water through an ordinary drought order.
- Augmentation of the River Dee with water from Pen-y-Cae Reservoir – Reducing net abstraction from the River Dee through its augmentation using water from Pen-y-Cae Reservoir. This is a requirement of the Dee Drought Directions.

5.2 Method of assessment

The environmental assessment of the drought options has been through an 'objectives led' assessment as recommended by the UKWIR document *Strategic Environmental Assessment and Habitats Regulations Assessment – Guidance for Water Resources Management Plans and Drought Plans (2012).*

The assessment objectives have been developed through the review of the relevant policies, plans and programmes and through the establishment of the baseline conditions. Table 12 details the SEA topics that have been reviewed and the corresponding objectives that have been developed.

The performance of the drought options has been assessed in relation to each of the SEA objectives to determine how well the options meet the objectives. Colour coding has been used to indicate if the effect of the options are beneficial, adverse or somewhere in between. Table 11 shows the colour coding for the assessment.

Colour	Effect
	Major benefit
	Minor benefit
	Negligible
	Minor adverse
	Major adverse
	Not applicable
	Mixed beneficial/adverse
	Uncertain

Table 11: Legend for colour coding of impact significance of options on objectives

5.3 SEA objectives

Table 12 below details the SEA objectives that have been developed to review the drought options against.

SEA Topic	SEA Objective
Biodiversity	Protect and enhance biodiversity related to our supply area, this includes sources which are outside the supply area.
	Protect and enhance designated conservation areas (SACs, SPAs, Ramsar, SSSIs) related to our supply area.
Human beings	Protect and improve health and wellbeing
	Protect and improve recreational activities
	Maintain the social and economic capacity of the area
Soil, geology and land use	Protect and enhance the quality of the soil and the geological diversity
Water	Provide a reliable and wholesome supply of water
	Protect and improve water quality
	Minimise adverse changes in water levels and flow
Air and climate	Minimise the impact of climate change
	Maintain and improve air quality, including the reduction of greenhouse gases
Material assets	Maintain a reliable supply of water for both domestic and non-domestic customers.
Archaeology and cultural heritage	Protect the archaeological and cultural heritage and access to it
Landscape and visual amenity	Protect and enhance all landscapes and visual amenities

Table 12: SEA objectives

5.4 Assessment

The assessment of the drought options has been carried out using the method described in section 5.2 and included in Appendix E – SEA Appraisal tables. A summary of the options and their likely impacts is given in Table 13.

As we are a small company with few drought options we have considered the cumulative effect of these options to be minimal. We have also assessed the cumulative effect of our options in relation to United Utilities and Dwr Cymru, and have also determined these to be minimal.

None of our drought options requires schemes that may have a detrimental effect on the ecosystem services that we rely upon.

Drought options	Summary of potential impacts	SEA Objectives							
		Biodiversity	Human beings	Soil, geology and land use	Water	Air and climate	Material assets	Archaeology and cultural	Landscape and visual
Increased water efficiency promotion	Possibility of a long term reduction in demand leading to reduced abstraction and increased security of supply.								
Increased leakage and repair activity	Potential to reduce the economic level of leakage as a result of reduced background leakage. Minor disturbances to local habitats.								
Water use restrictions	Potential for minor adverse impacts on local businesses.								
Ordinary drought orders	Potential for minor adverse impacts on local businesses.								
Augment River Dee from Pen-y-Cae Reservoir	No impacts on the immediate locality if abstraction is not carried out below the minimum operating volume. Minor beneficial impact on the River Dee due to increased flow rates.								

Table 13: Summary of the assessment of drought options

6 MONITORING AND MITIGATION

From the SEA screening report we have concluded that none of our drought options are likely to cause any significant adverse environmental impacts.

The only possible situation that may require additional monitoring would be if a drought was to last longer than any of the historic scenarios that we have modelled. If this situation was to occur it may result in additional water being abstracted from our reservoirs. Utilisation of storage below the minimum operating volume could adversely impact the fish within the reservoirs. To mitigate the effects of abstracting below the minimum operating volume, additional monitoring would be undertaken; this would include, but not be limited to, the following measurements:

- Dissolved oxygen levels
- Alkalinity
- Turbidity
- pH levels

If necessary, aeration systems would be installed in the reservoirs to increase oxygen levels and minimise fish distress. Any netting and transfer of fish would be arranged during the drought as soon as environmental conditions were below an acceptable standard. Further investigations in relation to these options would be carried out prior to their implementation. The exact format and detail of the processes involved would be dependent on the circumstances and nature of the drought.

7 CONCLUSIONS

The options developed as part of the Drought Plan that would be implemented to ensure that we can provide an adequate supply of wholesome water to our customers with as little recourse as reasonably possible to drought orders or drought permits are:

- Increased water efficiency promotion
- Increased leakage detection and repair activity
- Water use restrictions
- Implementation of ordinary drought orders
- Augmentation of the River Dee with water from Pen-y-Cae Reservoir

The only one of these options that requires construction work is the increased repair activity as a result of additional leakage detection. For this option it can be argued that the leaks identified would require fixing at some point in the future and by carrying out increased leakage detection is just bringing the fix activity forward and not creating additional minor construction work.

There are a number of conservation areas / environmentally sensitive sites within the supply area but none of the drought options adversely impact these.

The SEA screening report has concluded that the drought options identified within the Drought Plan will not lead to any significant environmental impacts on the current baseline environment within the Supply Area and no new developments are required which will necessitate an environmental impact assessment. As the responsible operating authority we have concluded that a statutory SEA is not required for this Drought Plan.

8 REFERENCES

Periodic review 2014, Business Plan for 2015-20, Dee Valley Water (December 2013)

Water Resources Management Plan 2015-40, Dee Valley Water (December 2013)

Final Drought Plan 2013, United Utilities Water Plc (2013)
Environment Agency Wales Drought Plan, Natural Resources Wales (January 2012)

Dee General Direction, Natural Resources Wales (May 2013)

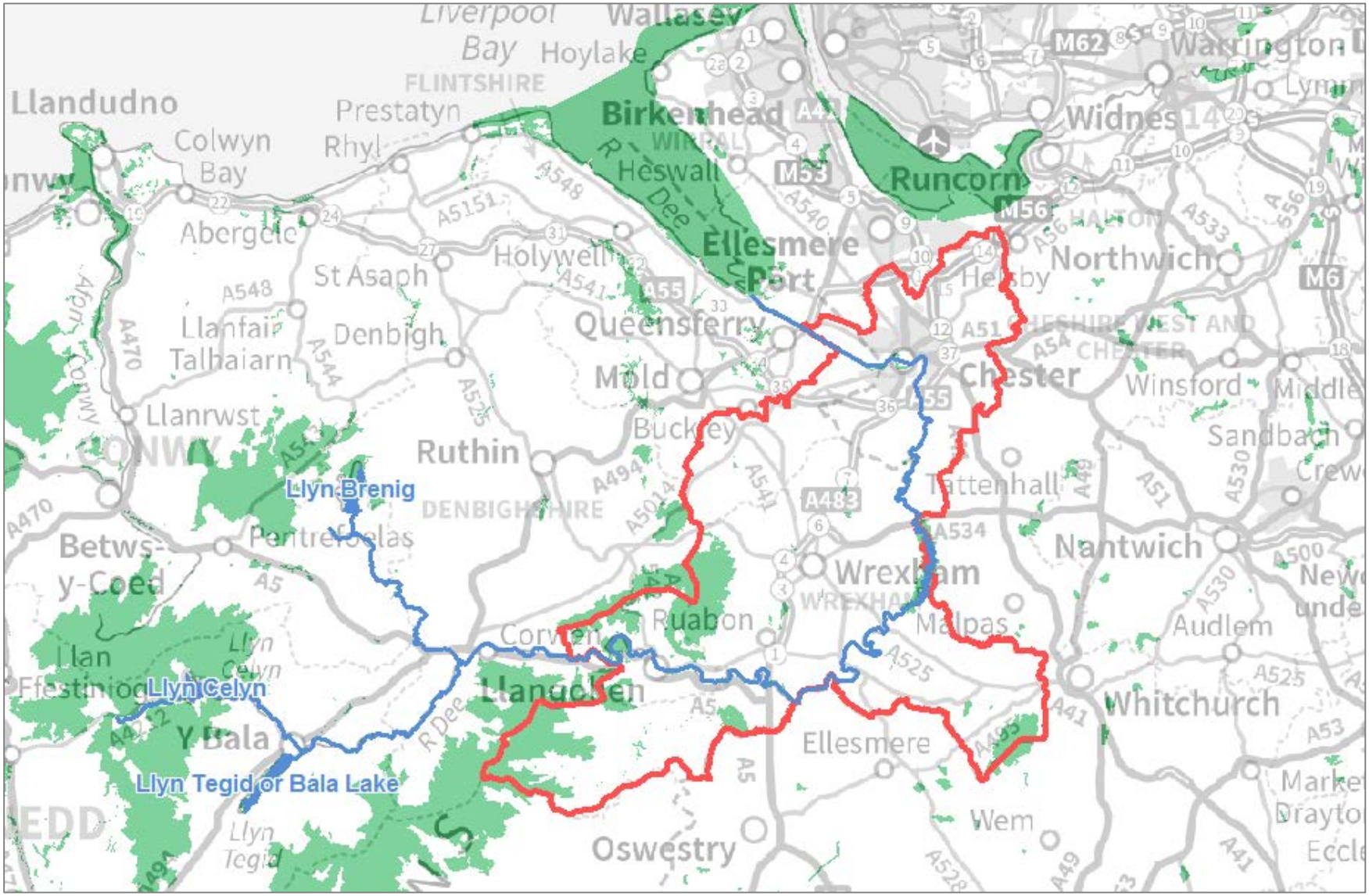
Strategic Environmental Assessment and Habitats Regulations Assessment – Guidance for Water Resources Management Plans and Drought Plans UKWIR (2012)

Drought permits and drought orders, Information from the Department of Environment, Food and Rural Affairs, Welsh Assembly Government and the Environment Agency (May 2011)

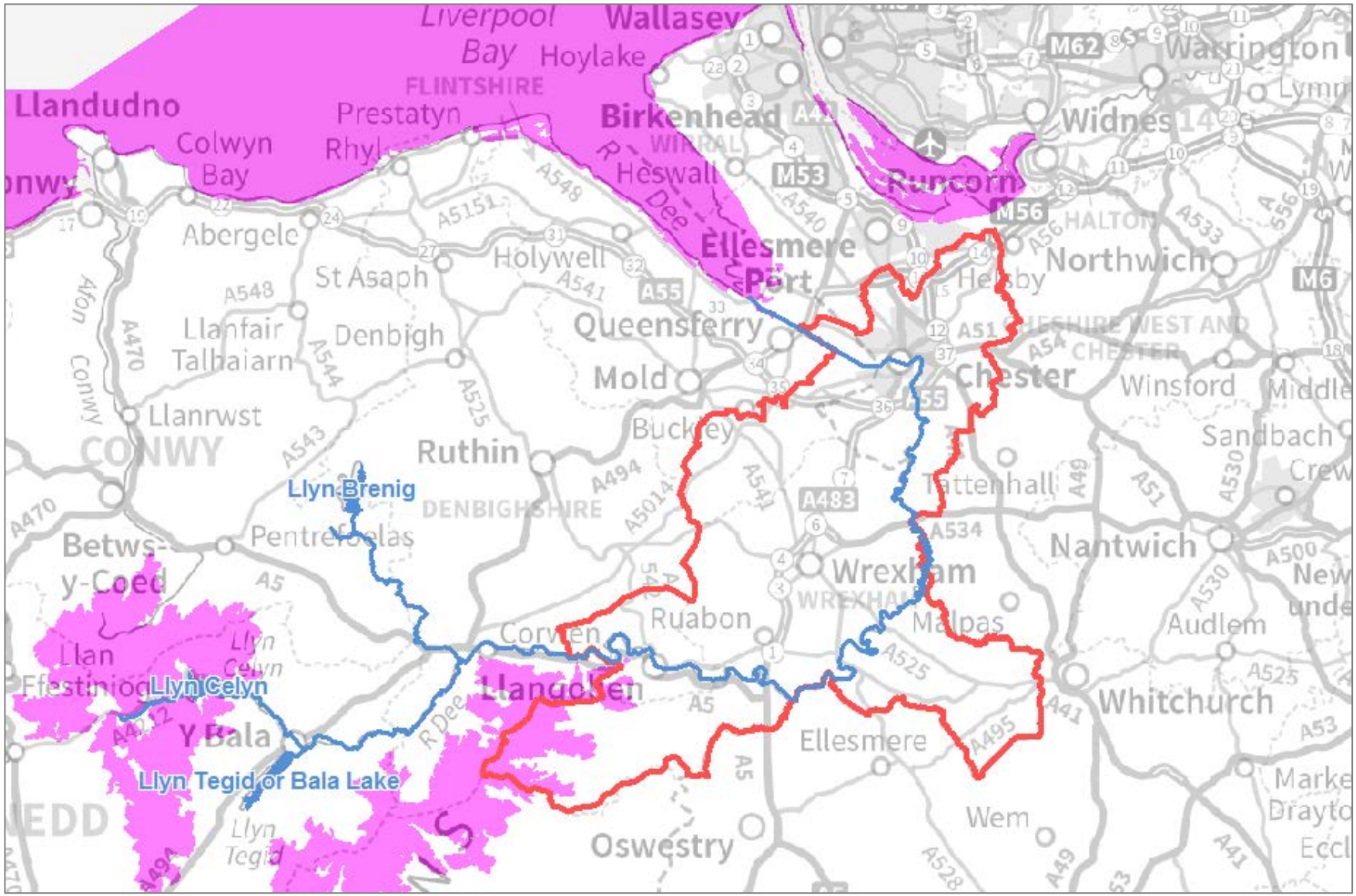
Water Company Drought Plan Guideline, Environment Agency (June 2011)

A Practical Guide to the Strategic Environmental Assessment Directive, Scottish Executive, Welsh Assembly Government, Department of the Environment, Northern Ireland, Office of the Deputy Prime Minister: London (September 2005)

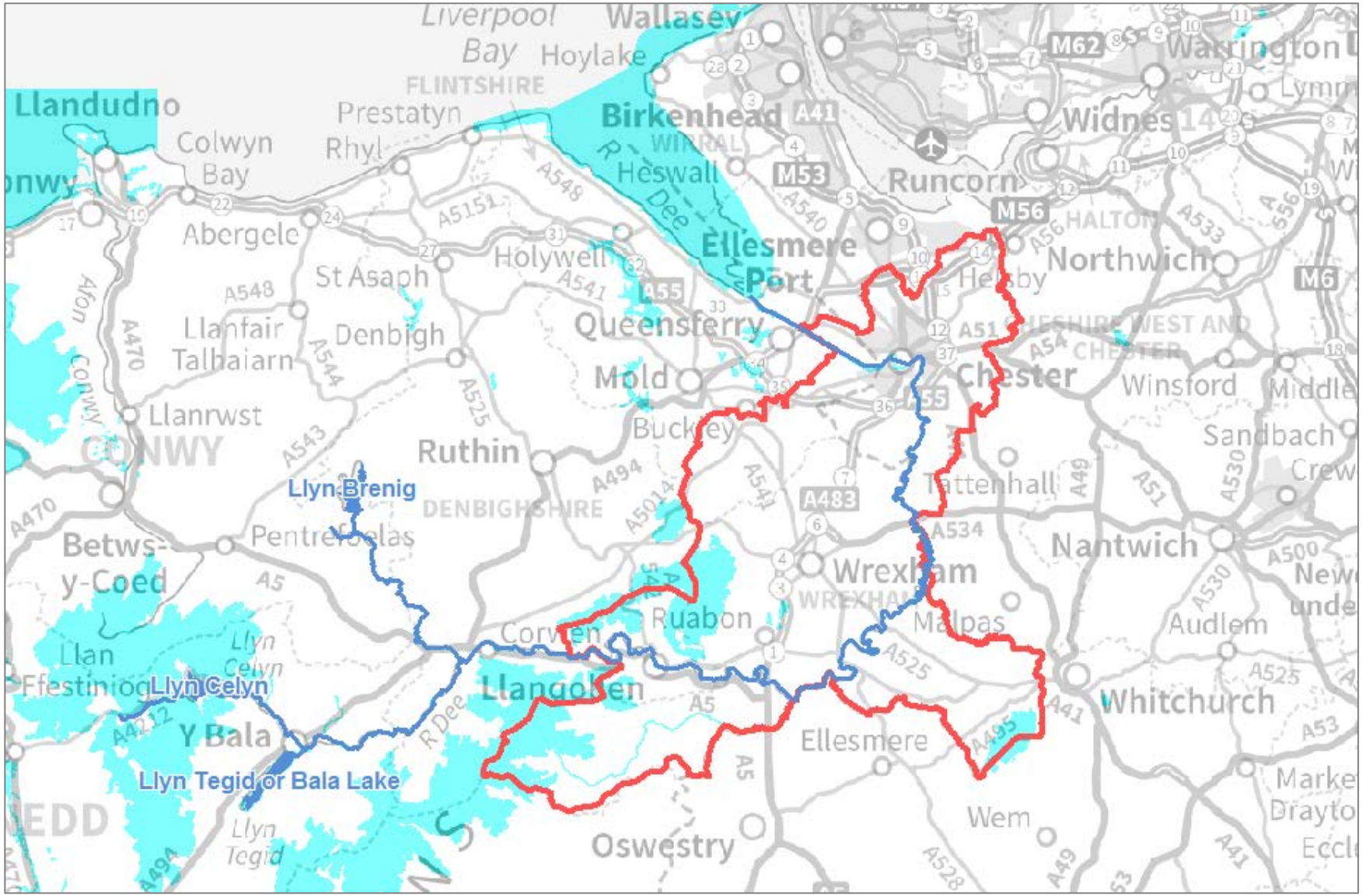
APPENDIX A – DESIGNATED CONSERVATION SITES AND WOODLAND AREAS



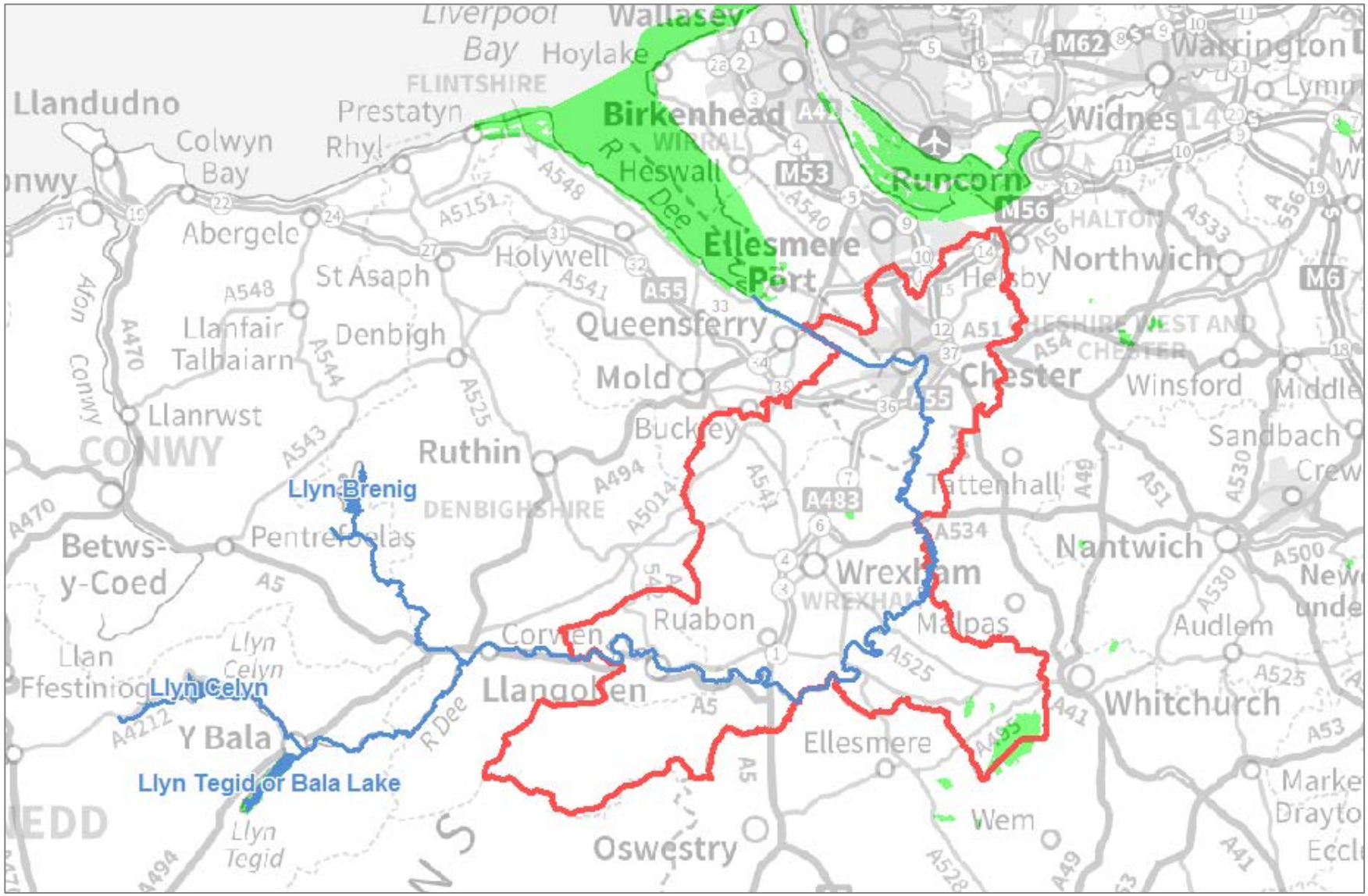
Sights of Special Scientific Interest (SSSI) within the Dee Valley Water supply area



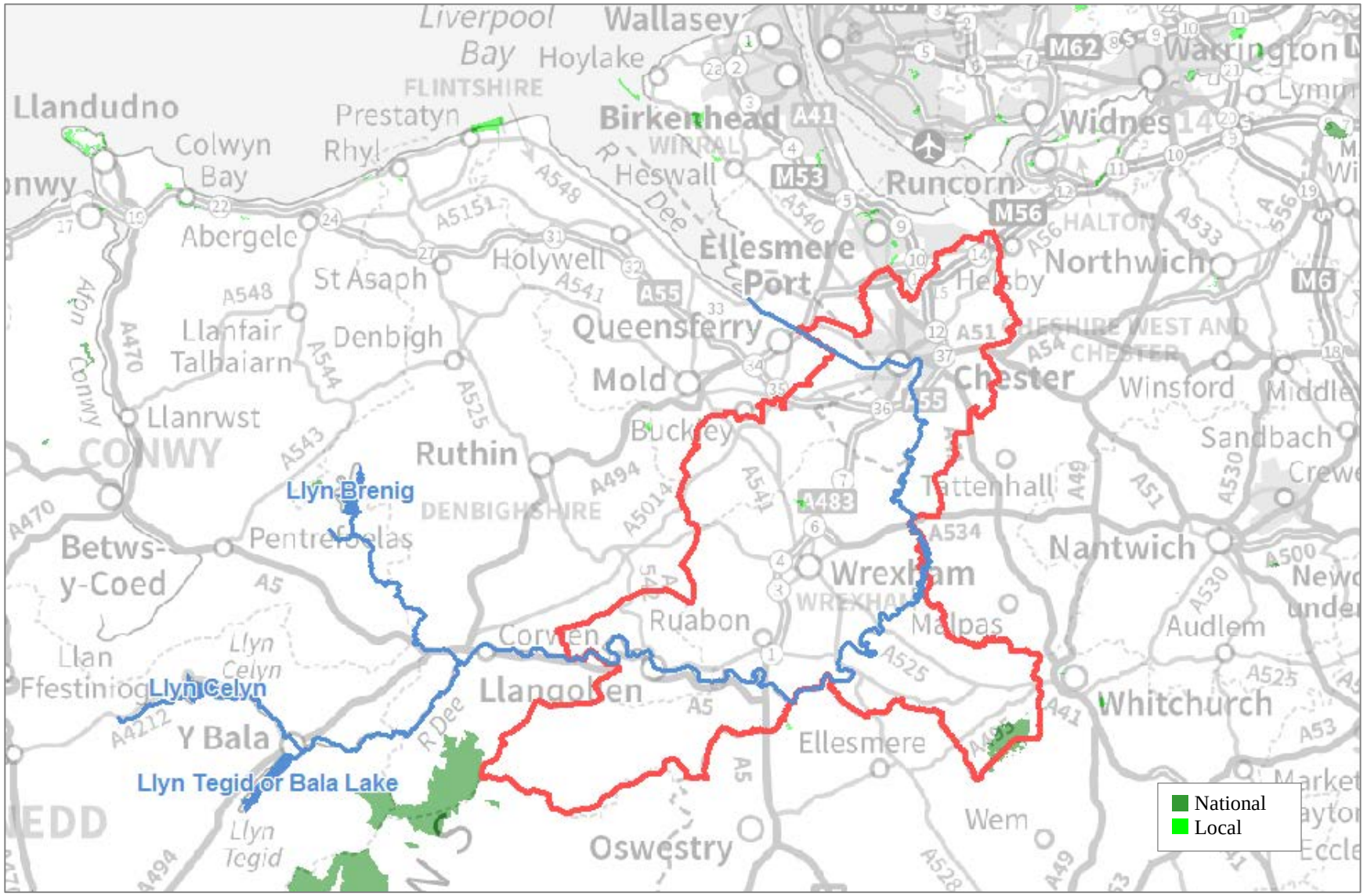
Special Protection Areas (SPAs) within the Dee Valley Water supply area



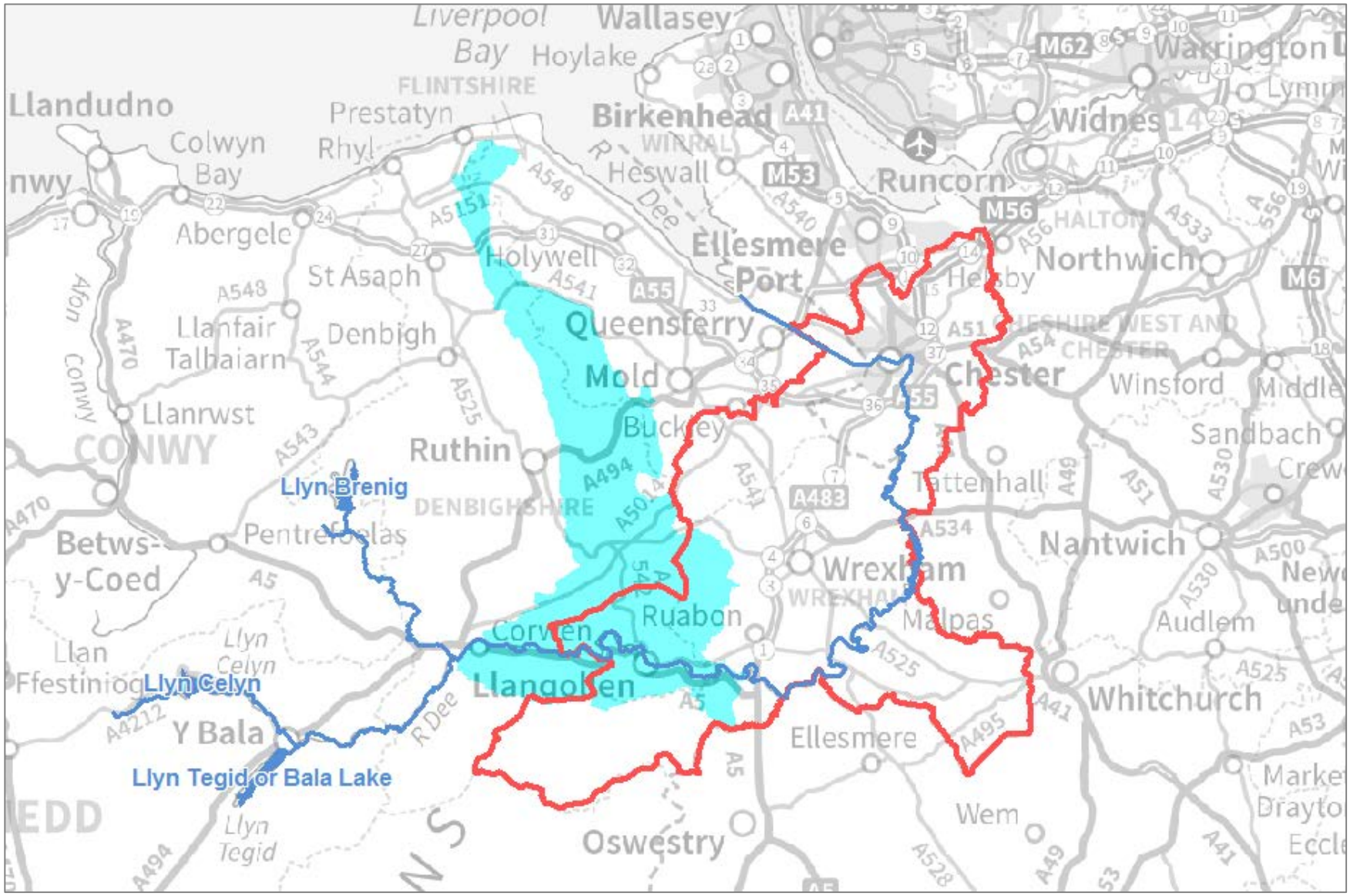
Special Areas of Conservation (SACs) within the Dee Valley Water supply area



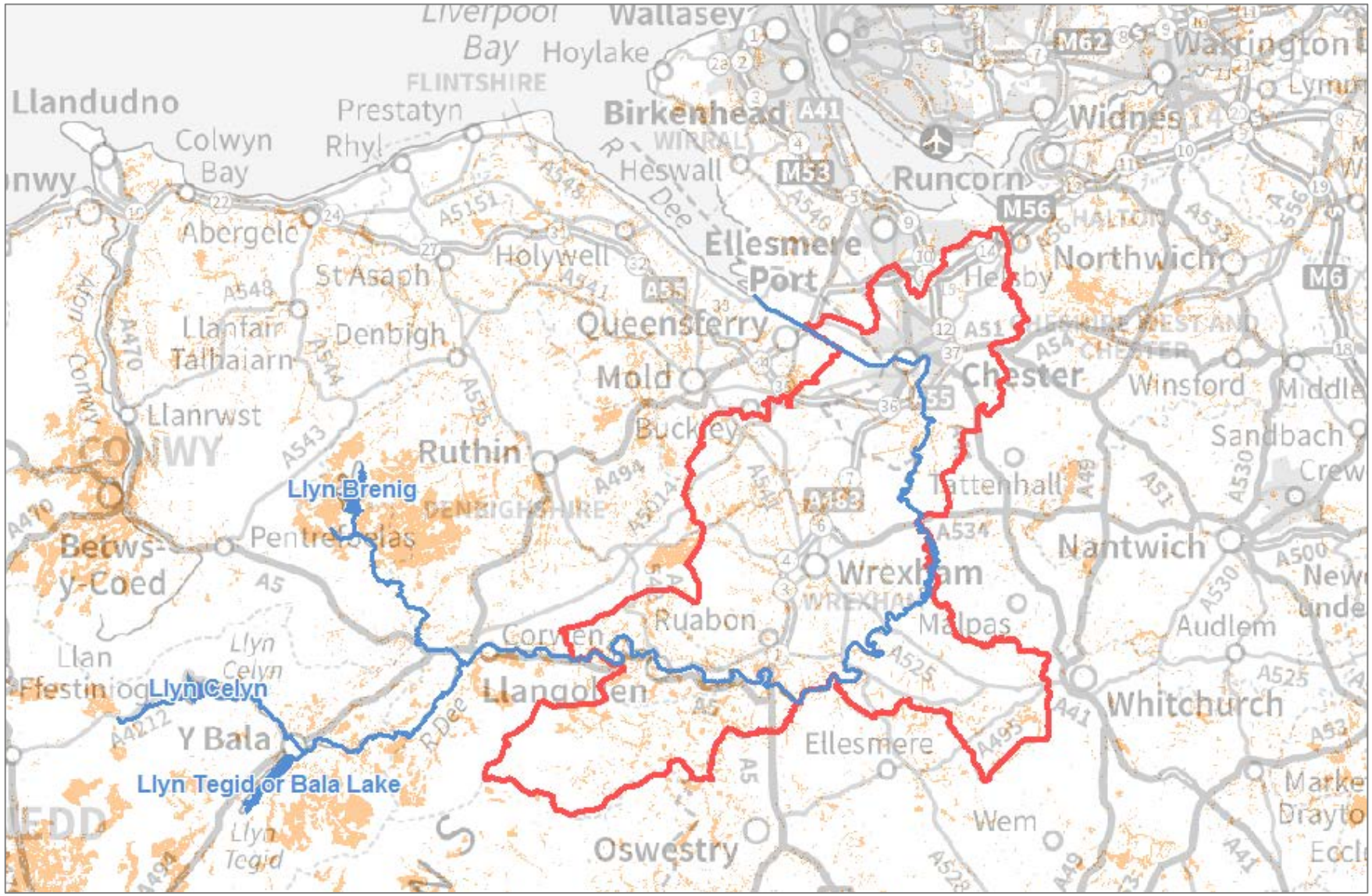
Ramsar areas within the Dee Valley Water supply area



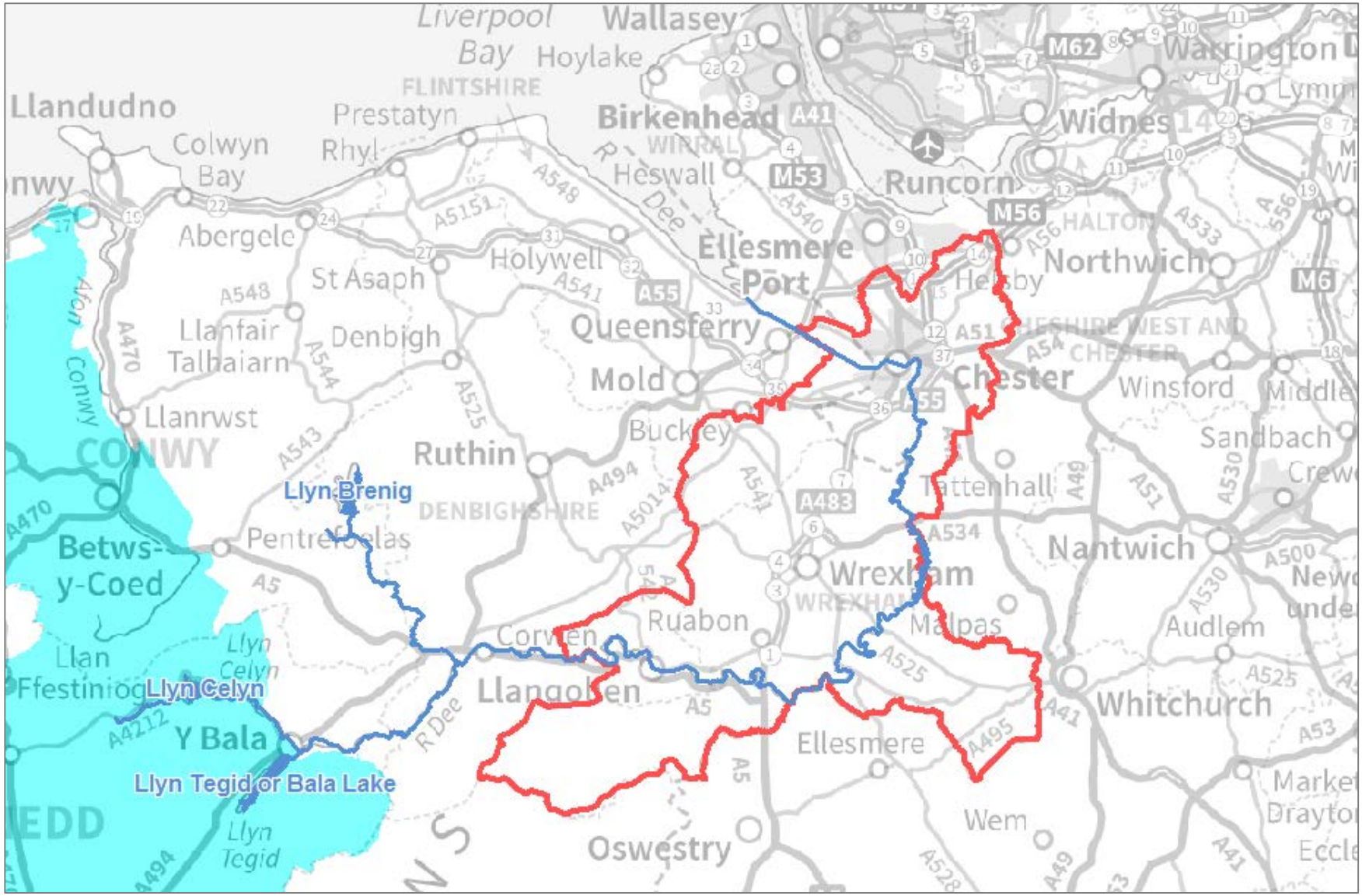
National and Local nature reserves within the Dee Valley Water supply area



Areas of outstanding natural beauty within the Dee Valley Water supply area

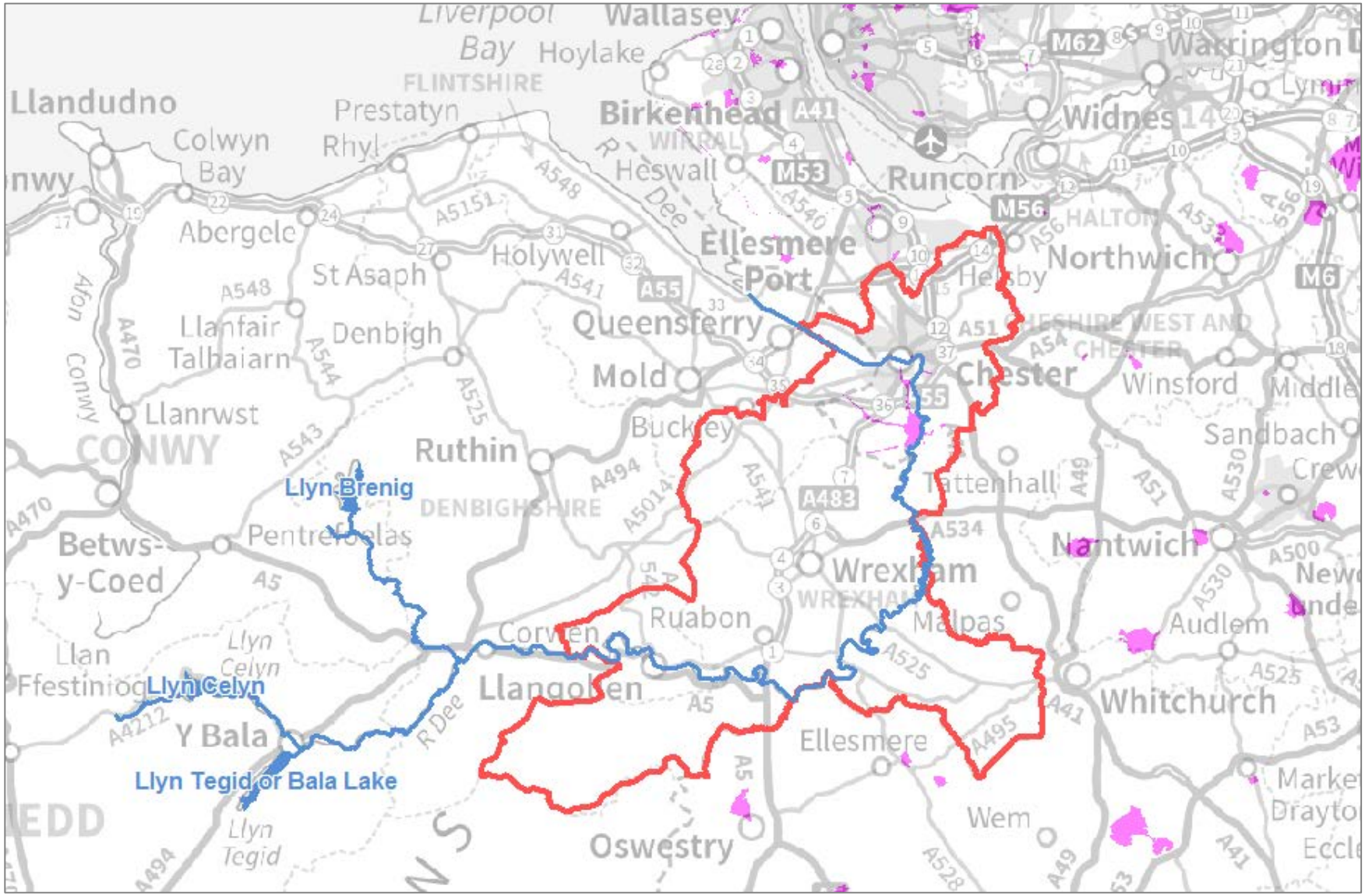


Woodland areas within the Dee Valley Water supply area

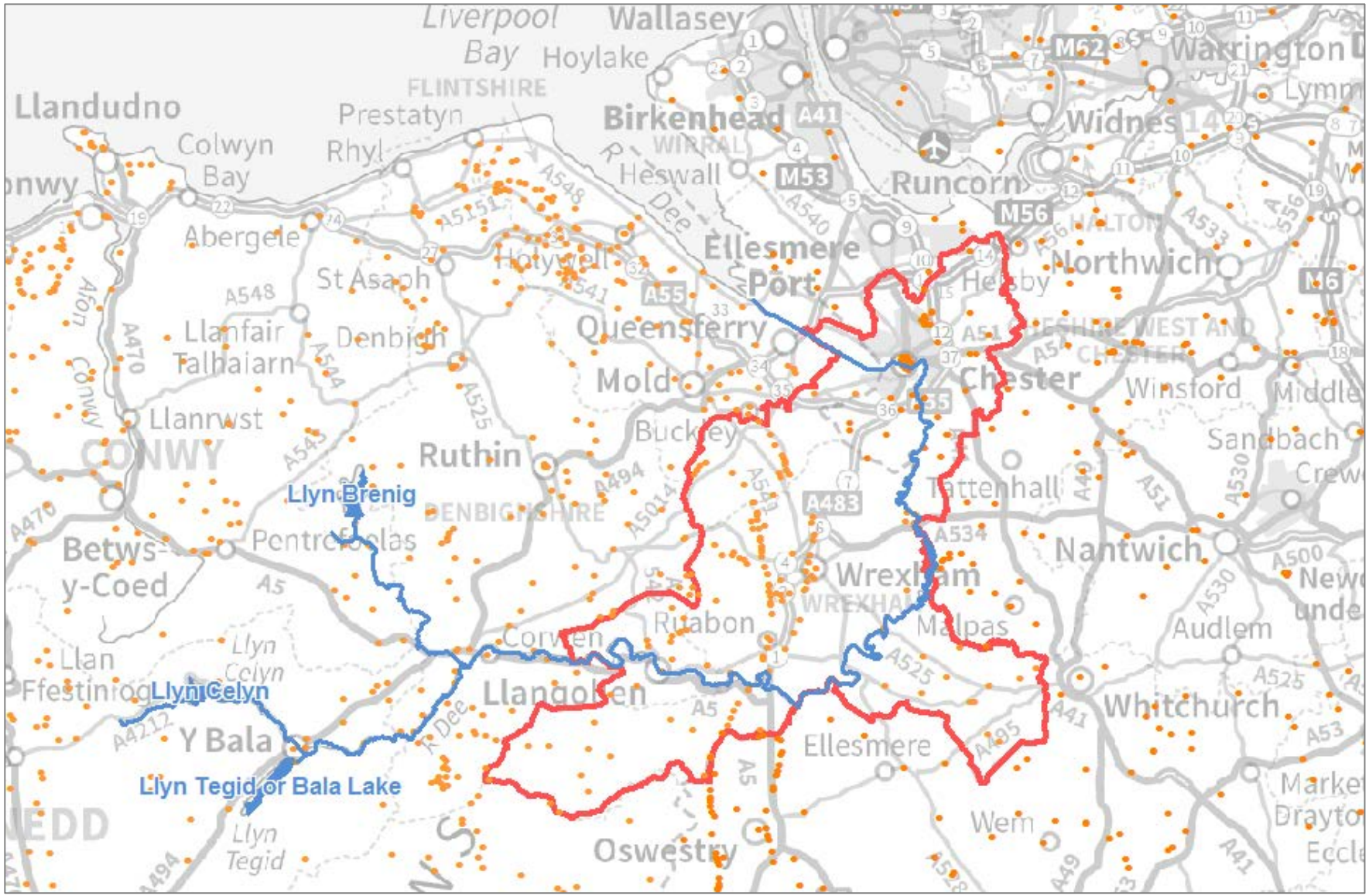


National parks within the Dee Valley Water supply area

APPENDIX B – ARCHAEOLOGY AND CULTURAL HERITAGE



Parks, gardens and country parks within the Dee Valley Water supply area (Welsh sites unavailable at time of printing)



Scheduled monuments within the Dee Valley Water supply area

APPENDIX C – EUROPEAN CONSERVATION AREAS

Type	Primary Features	Key Threats	Relevance to Plan
Midland Meres & Mosses Phase 2			
Ramsar	Open water and raised bog Supports a number of rare species of plants and invertebrates	Agricultural practices Eutrophication Siltation Reduced water levels Recreational activities Habitat change Fragmentation	None of the threats listed are proposed in the Drought Plan.
Fenn's, Whixall, Bettisfield, Wem and Cadney Mosses			
SAC	Active raised bog Degraded raised bogs still capable of natural regeneration	Reduced water levels Peat extraction Afforestation Agricultural practices Encroachment of scrub	None of the threats listed are proposed in the Drought Plan.
Johnstown Newt Sites			
SAC	Great crested newt population	Unregulated public access Fly-tipping Pollution Development	None of the threats listed are proposed in the Drought Plan.
River Dee and Bala Lake / Afon Dyfrdwy a Llyn Tegid			
SAC	Water courses of plain to montane levels Sea lamprey Brook lamprey River lamprey Atlantic salmon Bullhead Otter Floating water-plantain	Inappropriate flow regulation Excessive abstraction Direct and diffuse pollution Eutrophication Siltation Agricultural practices Engineering works Invasive plant species Fishing	DVW extracts water from the River Dee for supply to domestic and non-domestic customers. Abstraction outside existing allowances for our Sesswick and Barrelwell Hill sources is not proposed as part of the Drought Plan.
Berwyn and South Clwyd Mountains			
SAC/ SPA	European dry heaths Blanket bogs Transition mires Quaking bogs Calcareous and calshist screes of the montane to alpine levels Calcareous rocky slopes with chasmophytic vegetation Hen harrier Merlin Peregrine Red kite	Drainage Reseeding Fertilisers Burning Track construction Damaging razing regimes Encroachment of bracken	As part of the Dee Drought General Directions the River Dee will be augmented using water from Pen-y-Cae which is within the Berwyn and South Clwyn Mountains SAC/SPA. Abstraction outside existing allowances for this source is not proposed as part of the drought plan.

APPENDIX D – SITES OF SPECIAL SCIENTIFIC INTEREST

Name	Reason for Designation	Relevance to Plan
Berwyn	Moorland	None
Caeau Pen-y-Coed	Botanical	The River Dee runs with 100m, however water is not abstracted at this point.
Chirk Castle and parkland	Ancient woodland and parkland	None
Chwarel Pant Glas	Geological	None
Chwarel Singret	Geological	None
Clogau Quarry	Geological	None
Cloy Brook Pastures	Neutral grassland	None
Coed Talon Marsh	Botanical	None
Dee Cliffs, Farndon		The River Dee runs with 50m, however water is not abstracted at this point.
Dinas Bran	Geological	None
Fenn's Whixhall, Bettisfield, Wem and Cadney Mosses	Open water and peatland	None
Gatewen Marsh	Marsh	None
Hanmer Mere	Wetland	None
Llandegla Moor	Dry heath	None
Llay Bog	Meadow	None
Llyn Bedydd	Wetland and woodland	None
Marford Quarry	Entomological	None
Nant-y-Blean and Prynela Woods	Woodland	The River Dee runs with 50m, however water is not abstracted at this point.
Old Pulford Brook Meadows	Botanical	None
Pandy Quarries	Geological	None
River Dee	Geomorphological features and protected species	DVW extracts from the River Dee for supply to domestic and non-domestic customers. Abstraction is under licence from Natural Resources Wales which considers the integrity of the SSSI.
Ruabon/Llantysilio Mountains and Minera	Upland moorland and limestone cave system	None
Shell Brook Pastures	Botanical	None
Sontley Marsh	Marsh	None
Stryt Las a'r Hafod	Great crested newts and other amphibians	None
Vicarage Moss	Geomorphological and botanical	None
Well Rough and Long Plantation	Woodland	None

APPENDIX E – SEA APPRAISAL TABLES

Increased water efficiency promotion			
SEA Topic	**SEA Objective**	**Commentary**	**Impact**
Biodiversity	Protect and enhance biodiversity related to our supply area, this includes sources which are outside the supply area. Protect and enhance designated conservation areas (SACs, SPAs, Ramsar, SSSIs) related to our supply area.	The methods used to publicise information associated with the drought and drought actions is thought to have little or no impact on biodiversity. Promotion of water efficiency has the potential to have a long term impact on people's behaviour in relation to reduced consumption. If people use less water this could result in a reduced levels of abstraction. Overall increased water efficiency promotion has been classified as having a minor beneficial impact on biodiversity.	
Human beings	Protect and improve health and wellbeing Protect and improve recreational activities Maintain the social and economic capacity of the area	As per biodiversity. Reduced abstraction will lead to an increase security of supply.	
Soil, geology and land use	Protect and enhance the quality of the soil and the geological diversity	No impacts are anticipated.	
Water	Provide a reliable and wholesome supply of water Protect and improve water quality Minimise adverse changes in water levels and flow	As per biodiversity.	
Air and climate	Minimise the impact of climate change Maintain and improve air quality, including the reduction of greenhouse gases	No impacts are anticipated.	
Material assets	Maintain a reliable supply of water for both domestic and non-domestic customers.	As per biodiversity.	
Archaeology and cultural heritage	Protect the archaeological and cultural heritage and access to it	No impacts are anticipated.	
Landscape and visual amenity	Protect and enhance all landscapes and visual amenities	The potential for reduced consumption may lead to reduced abstraction and therefore reducing the impact of drought on the landscape and visual amenity. Increased water efficiency promotion has therefore been classified has having a minor beneficial impact on landscape and visual amenity.	

Increased leakage detection and repair activity			
SEA Topic	**SEA Objective**	**Commentary**	**Impact**
Biodiversity	Protect and enhance biodiversity related to our supply area, this includes sources which are outside the supply area. Protect and enhance designated conservation areas (SACs, SPAs, Ramsar, SSSIs) related to our supply area.	Repairing leaks may result in minor disturbances to local habitats but these are unlikely to be long term. Increased leakage detection activity may lead to lower levels of background leakage and therefore a lower economic level of leakage; consequently abstraction maybe reduced. Increased leakage detection and repair activities have been classified as having a minor beneficial impact on biodiversity.	
Human beings	Protect and improve health and wellbeing Protect and improve recreational activities Maintain the social and economic capacity of the area	Similar to biodiversity. Reduced abstraction will lead to an increased security of supply.	
Soil, geology and land use	Protect and enhance the quality of the soil and the geological diversity	Repairing leaks may result in minor disturbances to local soils. Increased leakage detection and repair activities have been classified as having a negligible impact on soil geology and land use.	
Water	Provide a reliable and wholesome supply of water Protect and improve water quality Minimise adverse changes in water levels and flow	Similar to biodiversity.	
Air and climate	Minimise the impact of climate change Maintain and improve air quality, including the reduction of greenhouse gases	Increased leakage detection and repair activities will result in an increase in the use of vehicles and plant and therefore an increase in carbon dioxide emissions. Conversely, reducing the levels of leakage will reduce the greenhouse emissions which result from the abstraction and treatment of water. Increased leakage detection and repair activities have been classified as having a negligible impact on the air and climate.	
Material assets	Maintain a reliable supply of water for both domestic and non-domestic customers.	Repairing leaks earlier on in their development may increase the asset life of the associated pipes and fittings. Early fixing of leaks has been classified as having a minor beneficial impact on material assets.	
Archaeology and cultural heritage	Protect the archaeological and cultural heritage and access to it	Detection and repairs will be on assets that are already in-situ therefore will not lead to any adverse impacts over and above those that were experienced when the assets were first installed. Increased leakage detection and repair activities have been classified as having a negligible impact on the archaeological and cultural heritage.	

Increased leakage detection and repair activity			
SEA Topic	**SEA Objective**	**Commentary**	**Impact**
Landscape and visual amenity	Protect and enhance all landscapes and visual amenities	The potential for reduced consumption may lead to reduced abstraction and therefore reduce the impact of drought on the landscape and visual amenity. Increased leakage detection and repair has therefore been classified as having a minor beneficial impact on landscape and visual amenity.	

Water use restrictions (voluntary use bans and temporary use bans)			
SEA Topic	**SEA Objective**	**Commentary**	**Impact**
Biodiversity	Protect and enhance biodiversity related to our supply area, this includes sources which are outside the supply area.	Water use restrictions have been considered to have no long term impact on consumption and therefore negligible impact on biodiversity.	
	Protect and enhance designated conservation areas (SACs, SPAs, Ramsar, SSSIs) related to our supply area.		
Human beings	Protect and improve health and wellbeing	As per biodiversity. There is the potential for water use restrictions to impact businesses associated with domestic swimming pools, cleaning of domestic motor vehicles with a hosepipe and cleaning of walls, or windows of domestic premises using a hose pipe, however these are thought to be minimal. Water use restrictions have therefore been classified has having a minor adverse impact on human beings.	
	Protect and improve recreational activities		
	Maintain the social and economic capacity of the area		
Soil, geology and land use	Protect and enhance the quality of the soil and the geological diversity	No impacts are anticipated.	
Water	Provide a reliable and wholesome supply of water	As per biodiversity.	
	Protect and improve water quality		
	Minimise adverse changes in water levels and flow		
Air and climate	Minimise the impact of climate change	No impacts are anticipated.	
	Maintain and improve air quality, including the reduction of greenhouse gases		
Material assets	Maintain a reliable supply of water for both domestic and non-domestic customers.	No impacts are anticipated.	
Archaeology and cultural heritage	Protect the archaeological and cultural heritage and access to it	No impacts are anticipated.	
Landscape and visual amenity	Protect and enhance all landscapes and visual amenities	The potential for reduced consumption may lead to reduced abstraction and therefore reduce the impact of drought on the landscape and visual amenity. Water use restrictions have therefore been classified as having a minor beneficial impact on landscape and visual amenity.	

Ordinary drought order (non-essential use ban)			
SEA Topic	**SEA Objective**	**Commentary**	**Impact**
Biodiversity	Protect and enhance biodiversity related to our supply area, this includes sources which are outside the supply area.	Water use restrictions have been considered to have no long term impact on consumption and therefore negligible impact on biodiversity.	
	Protect and enhance designated conservation areas (SACs, SPAs, Ramsar, SSSIs) related to our supply area.		
Human beings	Protect and improve health and wellbeing	There is a potential for minor social and economic impacts upon businesses related to non-domestic swimming pools, mechanical vehicle washers and cleaning of non-domestic premises (including industrial plan). Ordinary drought orders have therefore been classified as having a minor adverse impact on human beings.	
	Protect and improve recreational activities		
	Maintain the social and economic capacity of the area		
Soil, geology and land use	Protect and enhance the quality of the soil and the geological diversity	No impacts are anticipated.	
Water	Provide a reliable and wholesome supply of water	As per biodiversity.	
	Protect and improve water quality		
	Minimise adverse changes in water levels and flow		
Air and climate	Minimise the impact of climate change	No impacts are anticipated.	
	Maintain and improve air quality, including the reduction of greenhouse gases		
Material assets	Maintain a reliable supply of water for both domestic and non-domestic customers.	No impacts are anticipated.	
Archaeology and cultural heritage	Protect the archaeological and cultural heritage and access to it	No impacts are anticipated.	
Landscape and visual amenity	Protect and enhance all landscapes and visual amenities	The potential for reduced consumption may lead to reduced abstraction and therefore reduce the impact of drought on the landscape and visual amenity. Ordinary drought orders have therefore been classified as having a minor beneficial impact on landscape and visual amenity.	

Augmentation of the River Dee from Pen-y-Cae Reservoir			
SEA Topic	**SEA Objective**	**Commentary**	**Impact**
Biodiversity	Protect and enhance biodiversity related to our supply area, this includes sources which are outside the supply area.	It is not anticipated that we will abstract below the minimum operating volume of the Pen-y-Cae Reservoir, therefore this option has been classified as having negligible impact on biodiversity within the immediate area. Augmenting the River Dee should increase flow rates within the river and therefore reduce the likelihood of adverse effects on biodiversity due to low flows.	
	Protect and enhance designated conservation areas (SACs, SPAs, Ramsar, SSSIs) related to our supply area.		
Human beings	Protect and improve health and wellbeing	A local fishing club is based on Pen-y-Cae Reservoir. As there is no plan to abstract below the minimum operating volume this option has been classified as having negligible adverse impact on human beings.	
	Protect and improve recreational activities		
	Maintain the social and economic capacity of the area		
Soil, geology and land use	Protect and enhance the quality of the soil and the geological diversity	No impacts are anticipated.	
Water	Provide a reliable and wholesome supply of water	No impacts are anticipated.	
	Protect and improve water quality		
	Minimise adverse changes in water levels and flow		
Air and climate	Minimise the impact of climate change	No impacts are anticipated.	
	Maintain and improve air quality, including the reduction of greenhouse gases		
Material assets	Maintain a reliable supply of water for both domestic and non-domestic customers.	No impacts are anticipated.	
Archaeology and cultural heritage	Protect the archaeological and cultural heritage and access to it	No impacts are anticipated.	
Landscape and visual amenity	Protect and enhance all landscapes and visual amenities	No impacts are anticipated.	