Spring 2023

Regional Water Resources Plan–South West

Strategic Environmental Assessment

Environmental Report – Appendices A to G

Data disclaimer: This document uses best available data at time of writing. As data relating to population forecasts and trends are based on information gathered before the Covid-19 Pandemic, monitoring and feedback will be used to capture any updates. The National Water Resources Plan will also align to relevant updates in applicable policy. In December 2022, the Water Services (Amendment) (No. 2) Act, 2022 was signed into law. This act legislates that from the 31 December 2022, Irish Water will only be known as Uisce Éireann. It also provides that, from that date, all references in any enactment, legal proceedings or other document to Irish Water shall be construed as references to Uisce Éireann only. Therefore in Appendices A to G of the Strategic Environmental Assessment, which was developed prior to the name change, all references to Irish Water shall be construed as Uisce Éireann.

Baseline data included in the RWRP-EM has been incorporated from numerous sources including but not limited to; National Planning Framework, Central Statistics Office, Regional Spatial and Economic Strategies, Local Authority data sets, Regional Assembly data sets and Irish Water data sets. Data sources will be detailed in the relevant sections of the RWRP-EM. 2019 was selected as the base year to align with the planning period (2019-2025) of the NWRP.

Appendix A Baseline Environment Figures

Figure 5.1a Population, Health and Material Assets (Built) Context – Overview

Figure 5.2a Water Context: Surface Waterbodies – Overview

Figure 5.2b Surface Waterbodies at Risk (EPA, December 2022)

Figure 5.3a Water Context: Groundwater – Overview

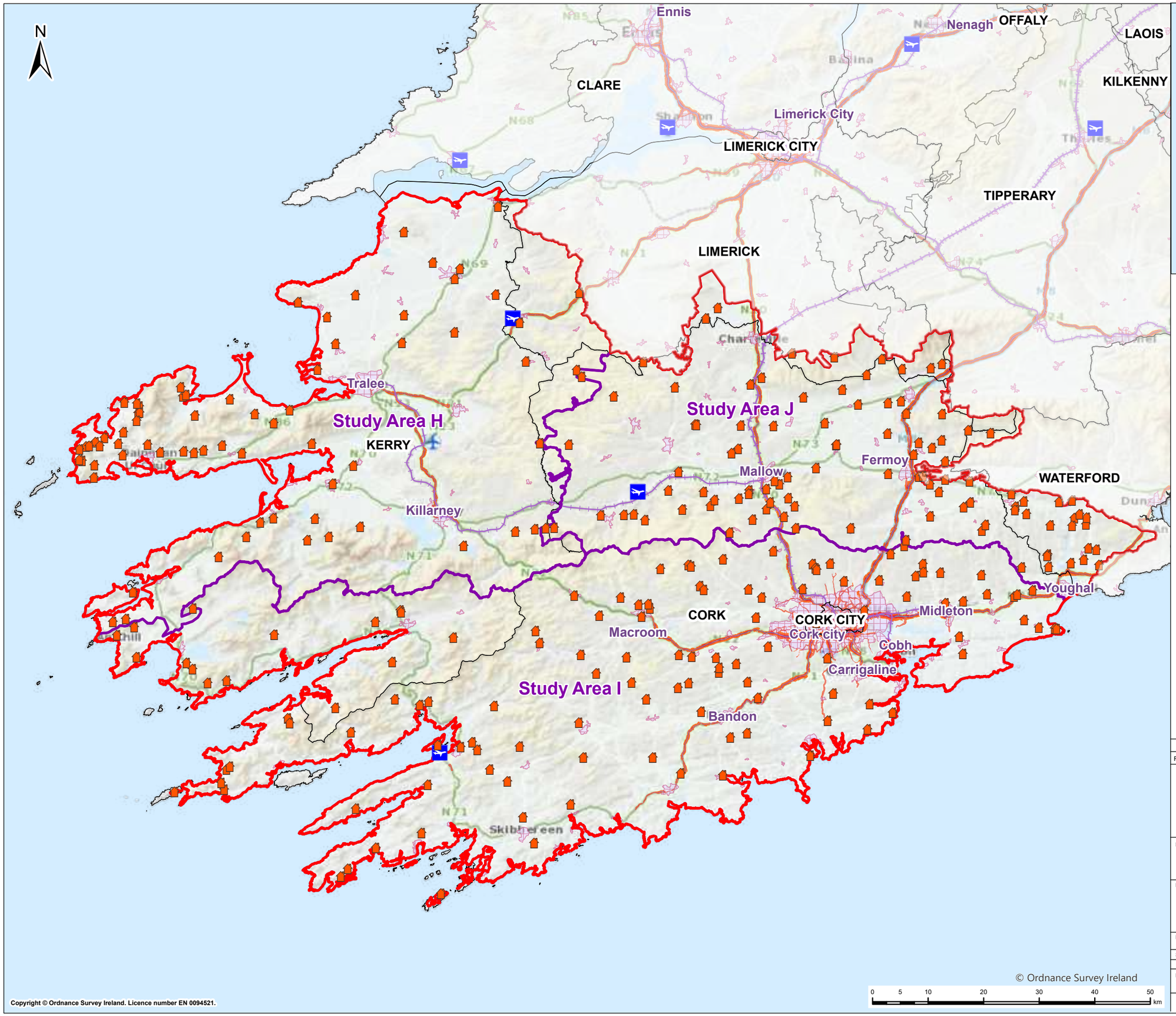
Figure 5.3b Ground Waterbodies at Risk (EPA, December 2022)

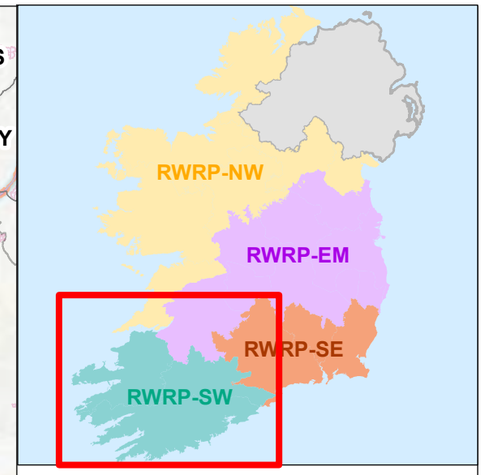
Figure 5.4 Water Context: Flood Risk

Figure 5.5 Biodiversity Context: Overview

Figure 5.6 Material Assets (Natural Assets) Context - Overview

Figure 5.7 Hydrogeology





Legend

- Settlement
- Water Treatment Plant (WTP)
- Airport
- Railway
- South West Region boundary
- Study area boundary
- Local authority boundary

Road

- Motorway
- National Road

Road Average Day-Evening-Night Noise, Round 3

Decibel (Db) Value

- 55-59
- 60-64
- 65-69
- 70-74
- 75+

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	3/4/2022	FINAL	MA	MO	RV	BF

UISCE ÉIREANN : IRISH WATER

Project

REGIONAL WATER RESOURCES PLAN SOUTH WEST

Drawing Title

POPULATION, HEALTH AND MATERIAL ASSETS (BUILT) CONTEXT – OVERVIEW

Drawing Status: **FINAL**

Scale @A3	1:650,000	DO NOT SCALE
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Drawing No.

FIGURE 5.1a

N

Ennis

Nenagh

Shannon

Limerick

Thurles

24 Shannon Estuary South

16 Suir

23 Tralee Bay-Feale

Charleville

Tralee

Study Area H

18 Blackwater (Munster)

Study Area J

Mallow

Clonmel

17 Colligan-Mahon

Dalgean

22 Laune-Maine-Dingle Bay-Inney

19 Lee, Cork Harbour and Youghal Bay

Cork

Carrigaline

21 Dunmanus-Bantry-Kenmare

Study Area I

Bandon

20 Bandon-Ilen

Skibbereen

0 5 10 20 30 40 60 km

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Legend

- South West Region boundary
- Study area boundary
- Water Framework Directive (WFD) Catchment

WFD River Waterbody

Ecological Status or Potential, 2016 - 2021

- High
- Good
- Moderate
- Poor
- Bad

WFD Lake, Transitional or Coastal Waterbody

Ecological Status or Potential, 2016 - 2021

- High
- Good
- Moderate
- Poor
- Bad

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	App'd
0	21/02/23	FINAL	PND	MEI	RV	BF

UISCE EIREANN / IRISH WATER

Project
REGIONAL WATER RESOURCES PLAN SOUTH WEST

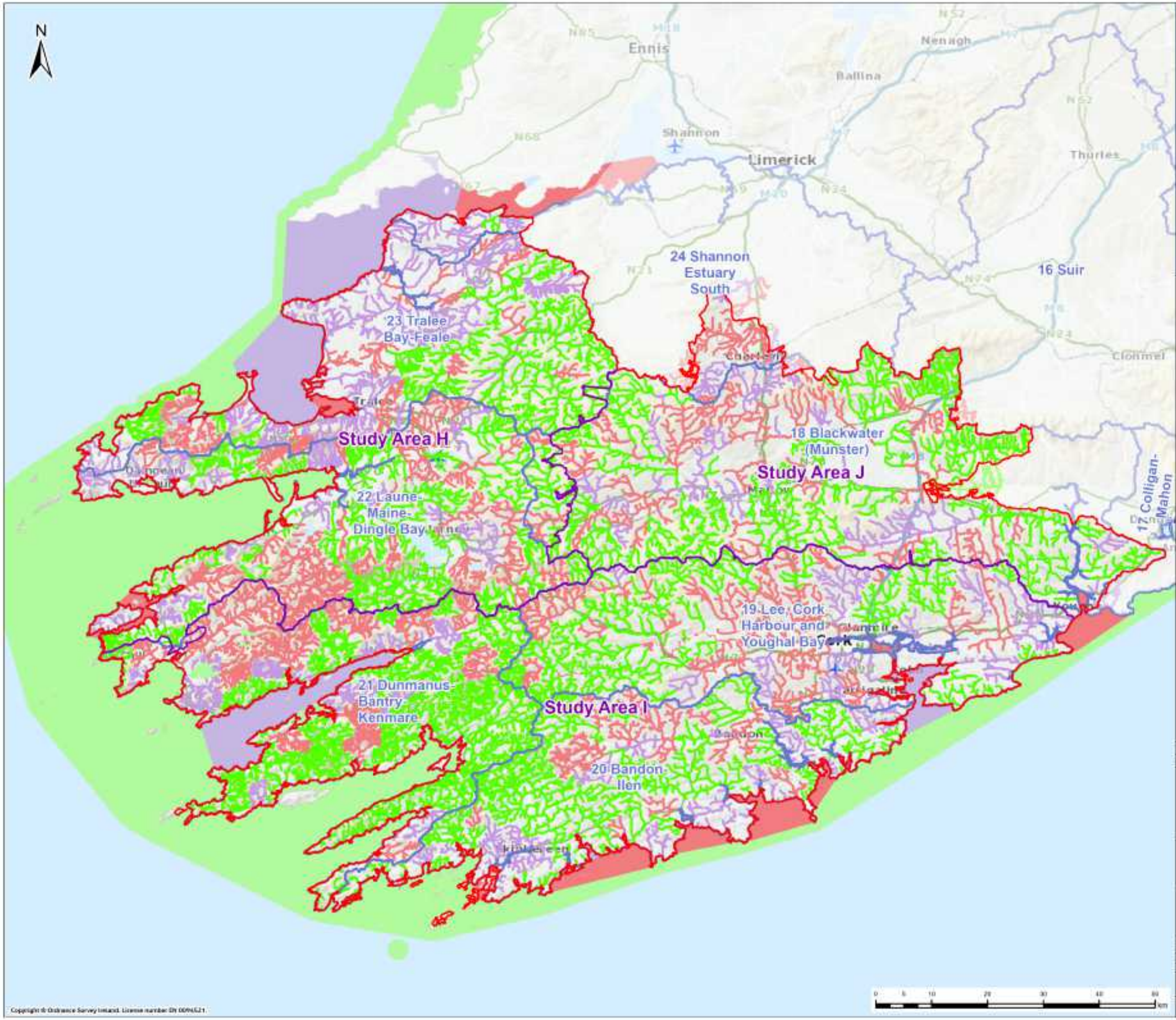
Drawing Title
WATER CONTEXT: SURFACE WATERBODIES - OVERVIEW

Drawing Status: FINAL

Scale @A1: 1:650,000 DO NOT SCALE

Filepath:

Drawing No.
FIGURE 5.2a



Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	App'd
0	[illegible]	FINAL	FND	MO	RV	BF

UISCE ÉIREANN : IRISH WATER

Project
REGIONAL WATER RESOURCES PLAN SOUTH WEST

Drawing Title
SURFACE WATERBODIES AT RISK (EPA, APRIL 2018)

Drawing Status
FINAL

Scale @A1: 1:650,000 — DO NOT SCALE

Filepath: [illegible]

Drawing No.
FIGURE 5.2b

N

24 Shannon Estuary South

16 Suir

23 Tralee Bay-Feale

Study Area H

18 Blackwater (Munster)

Study Area J

17 Colligan-Mahon

22 Laune-Maine-Dingle Bay

19 Lee, Cork Harbour and Youghal Bay

21 Dunmanus-Bantry-Kenmare

Study Area I

20 Bandon-Ilen

Legend

- South West Region boundary
- Study area boundary
- Water Framework Directive (WFD) Catchment

Ground Waterbody

Overall Ground Water Status 2016 - 2021

- Good
- Poor

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0	21/02/2023	FINAL	PND	MEI	RV	BF

UISCE EIREANN / IRISH WATER

Project
REGIONAL WATER RESOURCES PLAN SOUTH WEST

Drawing Title
WATER CONTEXT: GROUNDWATER - OVERVIEW

Drawing Status
FINAL

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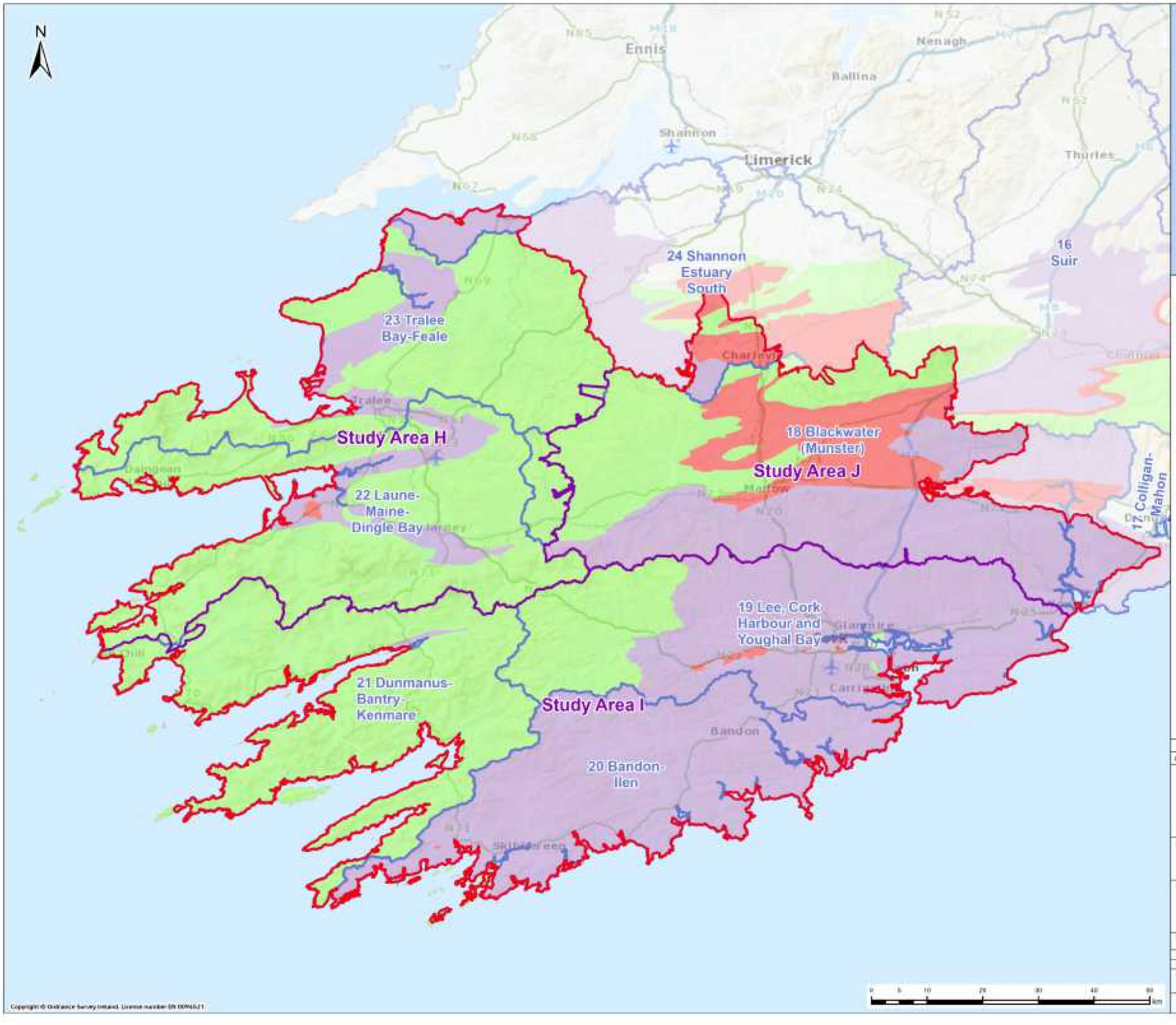
Drawing No.
FIGURE 5.3a

0 5 10 20 30 40 50 km



Legend

- South West Region boundary
- Study area boundary
- Water Framework Directive (WFD) Catchment

WFD Ground Waterbody

Approved Risk Projection

- At risk
- Not at risk
- Review

Rev	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	21/02/2023	FINAL	FND	MEI	RV	BF

UISCE EIREANN / IRISH WATER

Project: REGIONAL WATER RESOURCES PLAN SOUTH WEST

Drawing Title: GROUND WATERBODIES AT RISK (EPA, APRIL 2018)

Drawing Status: FINAL

Scale @A1: 1:650,000 DO NOT SCALE

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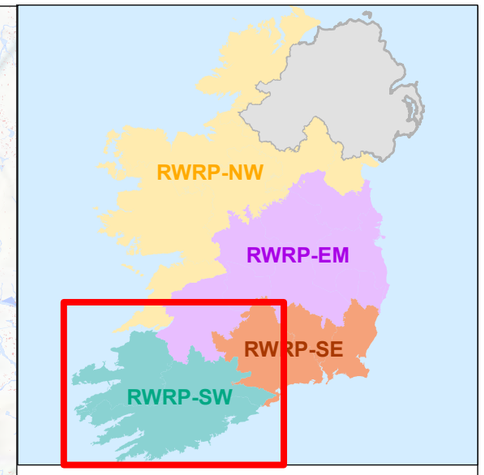
Drawing No: FIGURE 5.3b

N

Study Area H

Study Area J

Study Area I



Legend

- South West Region boundary
- Study area boundary
- Pluvial Flooding: 10% Annual Exceedance Probability (AEP)
- Pluvial Flooding: 1% Annual Exceedance Probability (AEP)
- Fluvial Flooding: 10% Annual Exceedance Probability (AEP)
- Fluvial Flooding: 1% Annual Exceedance Probability (AEP)
- Coastal Flooding: 10% Annual Exceedance Probability (AEP)
- Coastal Flooding: 1% Annual Exceedance Probability (AEP)
- Groundwater Flooding: High Probability
- Groundwater Flooding: Medium Probability

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0	3/4/2022	FINAL	MA	MO	RV	BF

UISCE ÉIREANN / IRISH WATER

Project
REGIONAL WATER RESOURCES PLAN
SOUTH WEST

Drawing Title
WATER CONTEXT:
FLOOD RISK

Drawing Status: **FINAL**

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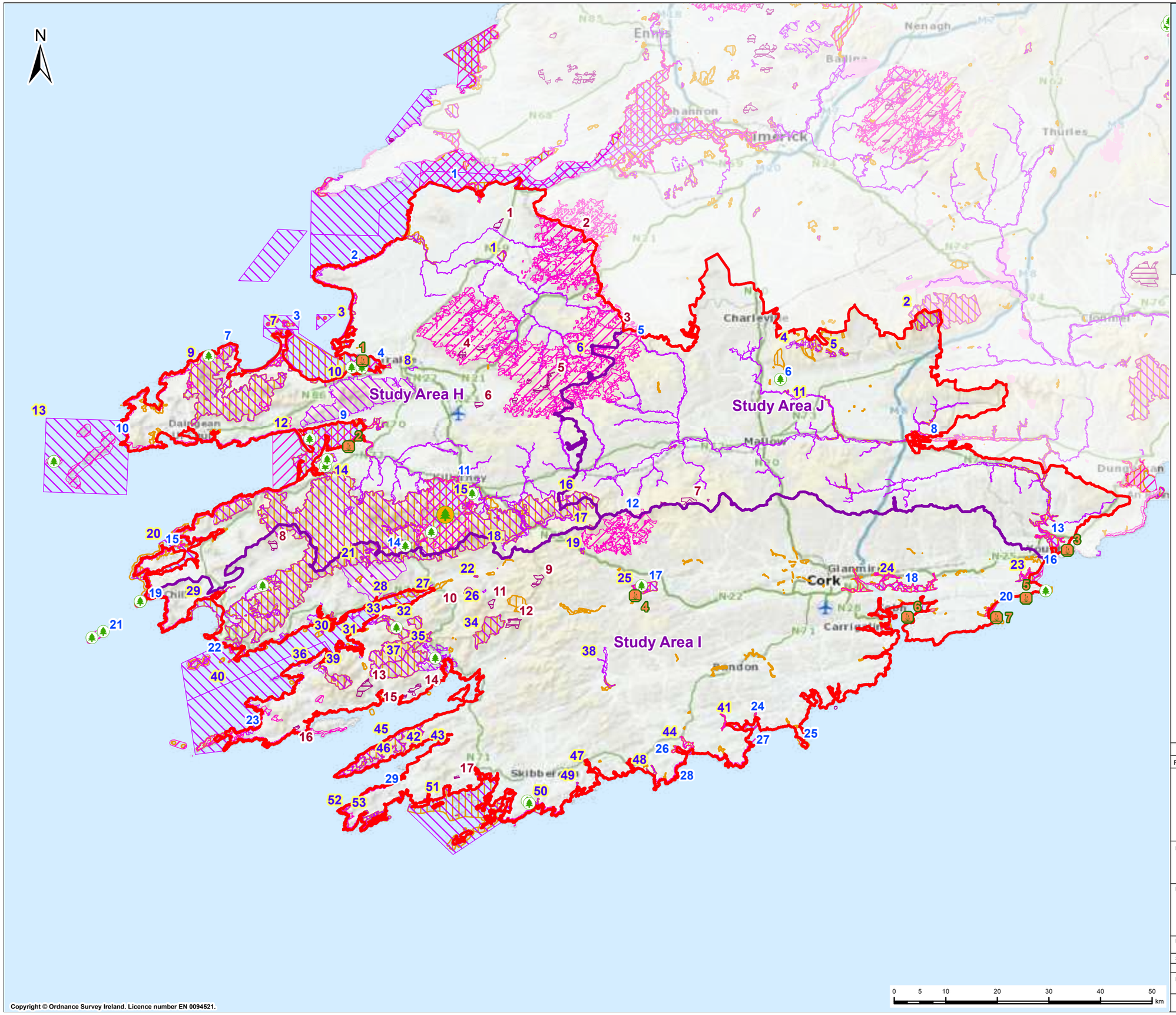
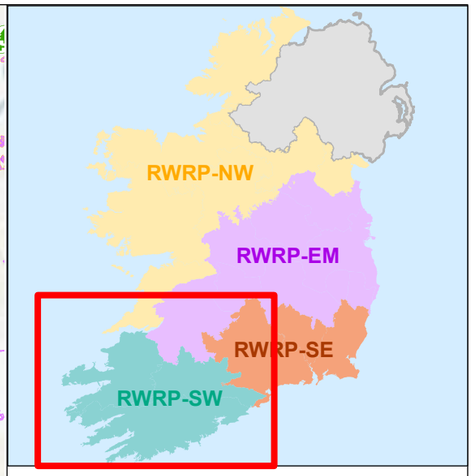
Drawing No.
FIGURE 5.4

0 5 10 20 30 40 50 km





Legend

- Ramsar Site
- Killarney National Park
- Nature Reserve
- South West Region boundary
- Study area boundary
- Special Area of Conservation (SAC)
- Special Protection Area (SPA)
- Natural Heritage Area (NHA)
- Proposed Natural Heritage Area (pNHA)
- Geological Heritage Site

Reference Labels Key

xx : Ramsar Site Reference Label
xx : NHA Reference Label
xx : SPA Reference Label
xx : SAC Reference Label

Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd
0	1/12/2022	FINAL	SMD	SJ	RV	BF

Project
REGIONAL WATER RESOURCES PLAN
SOUTH WEST

Drawing Title
BIODIVERSITY CONTEXT:
OVERVIEW

Drawing Status: **FINAL**

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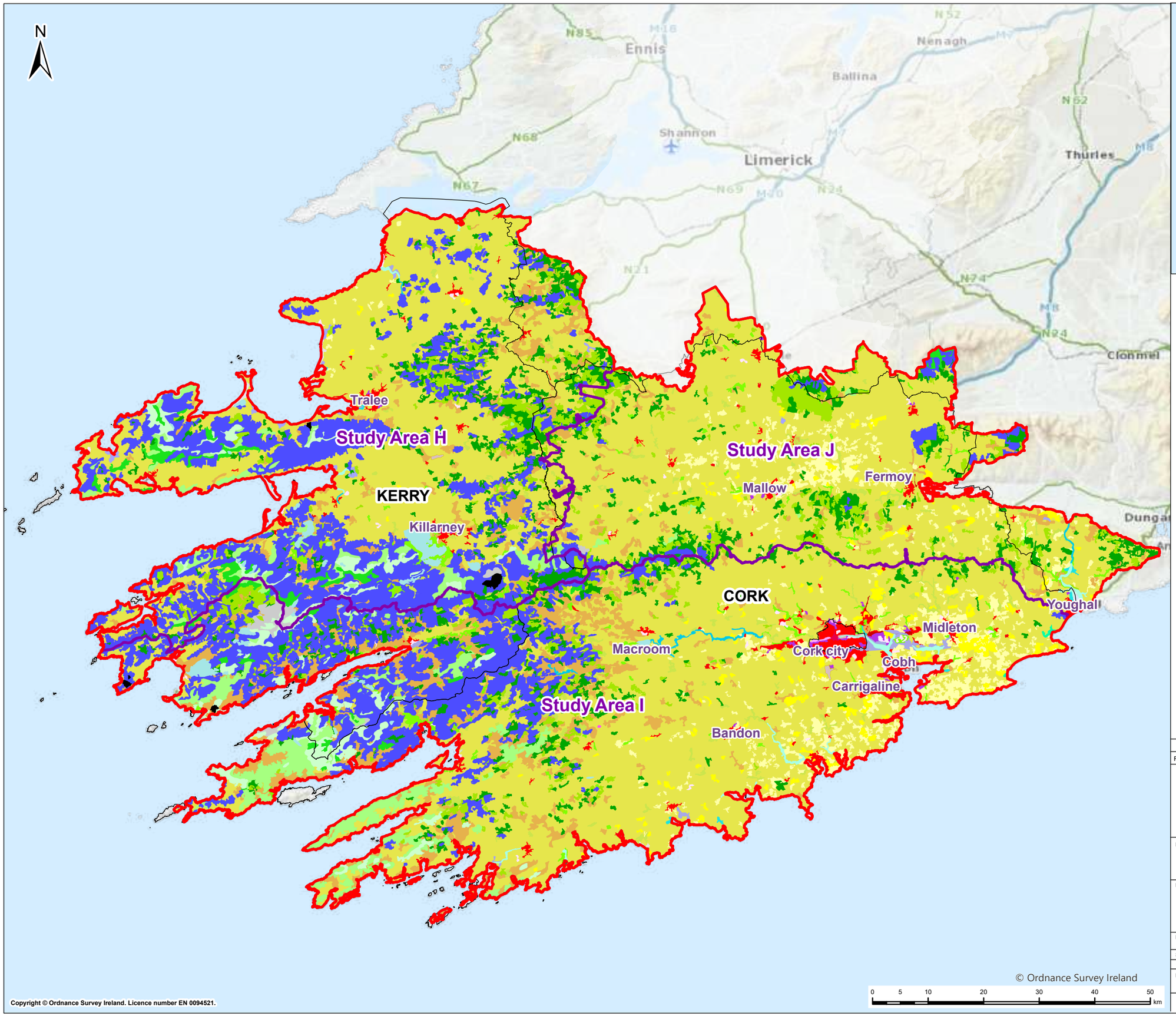
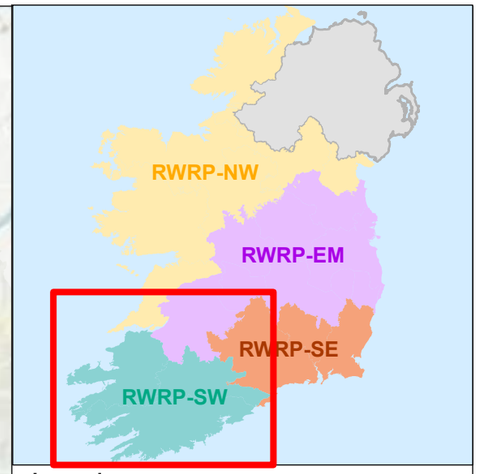
FIGURE 5.5





Legend

- South West Region boundary
- Study area boundary
- 111 Continuous urban fabric
- 112 Discontinuous urban fabric
- 121 Industrial or commercial units
- 122 Road and rail networks
- 123 Sea ports
- 124 Airports
- 131 Mineral extraction sites
- 133 Construction sites
- 141 Green urban sites
- 142 Sport and leisure facilities
- 211 Non-irrigated land
- 231 Pastures
- 242 Complex cultivation patterns
- 243 Principally agriculture with areas of natural vegetation
- 311 Broad-leaved forest
- 312 Coniferous forest
- 313 Mixed forest
- 321 Natural grassland
- 322 Moors and heaths
- 324 Transitional woodland scrub
- 331 Beaches, dunes, sand
- 332 Bare rocks
- 333 Sparsely vegetated areas
- 334 Burnt areas
- 411 Inland marshes
- 412 Peat bogs
- 421 Salt Marshes
- 423 Intertidal flats
- 511 Water courses
- 512 Water bodies
- 521 Coastal lagoons
- 522 Estuaries

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0	3/4/2022	FINAL	MA	MO	RV	BF

UISCE ÉIREANN IRISH WATER

Project

REGIONAL WATER RESOURCES PLAN
SOUTH WEST

Drawing Title

MATERIAL ASSETS (NATURAL ASSETS)
CONTEXT - OVERVIEW

Drawing Status: **FINAL**

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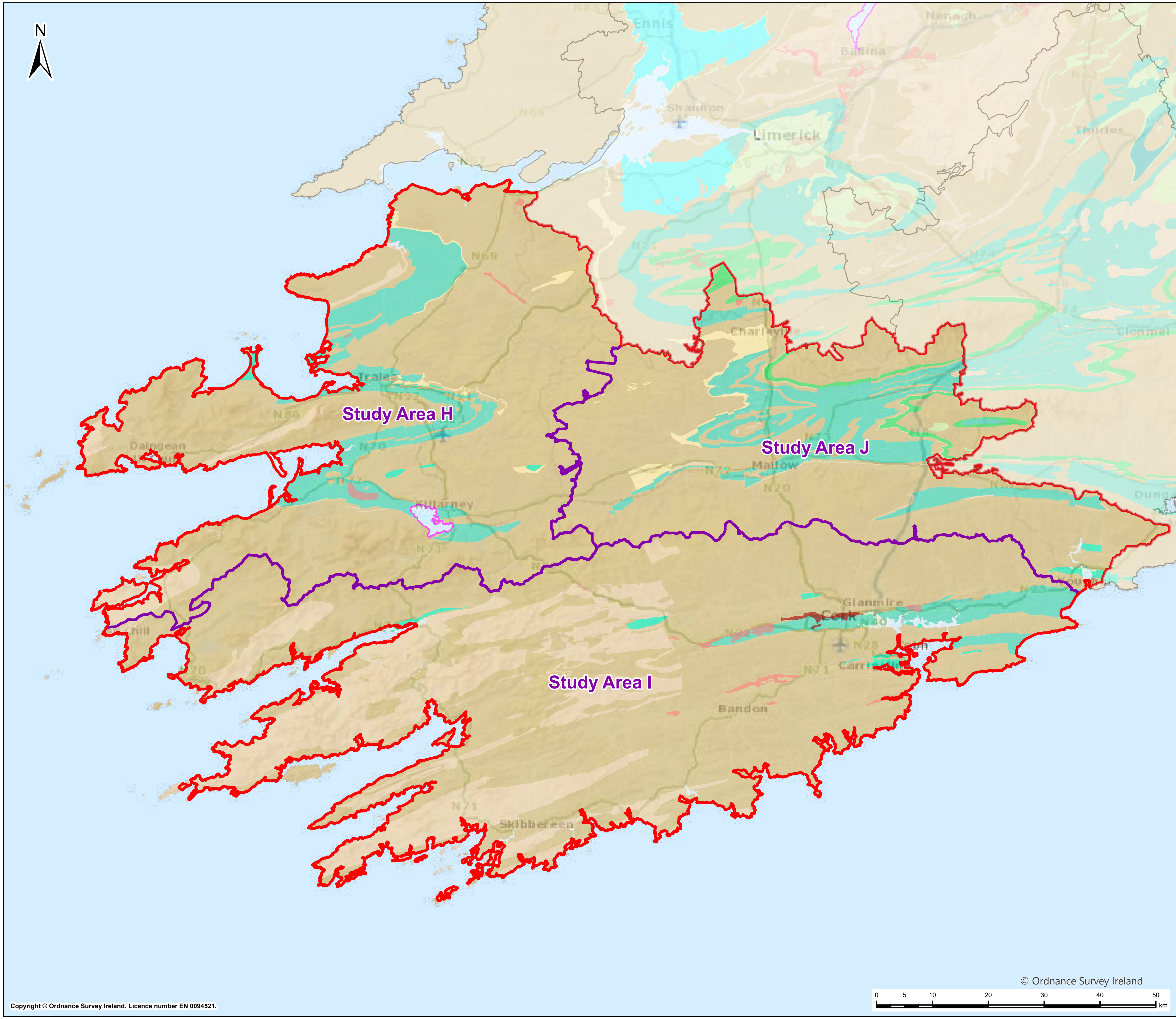
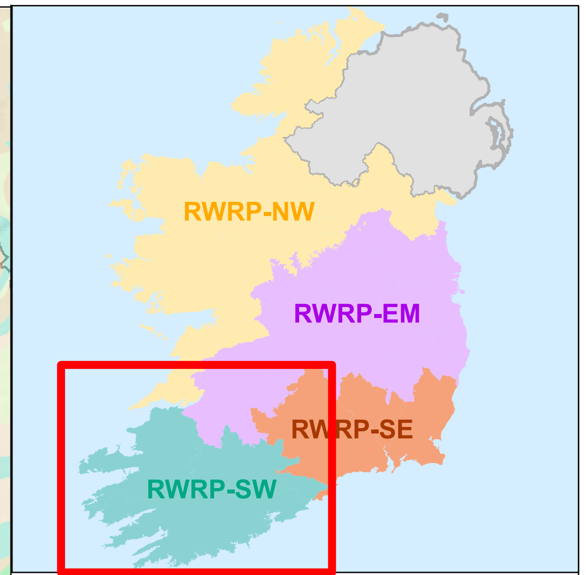
Drawing No.

FIGURE 5.6





Legend

South West Region boundary

Study area boundary

Gravel Aquifer

Locally important gravel aquifer

Regionally important gravel aquifer

Bedrock Aquifer

Regionally Important Aquifer - Karstified (conduit)

Regionally Important Aquifer - Karstified (diffuse)

Regionally Important Aquifer - Karstified

Regionally Important Aquifer - Fissured bedrock

Locally Important Aquifer - Bedrock which is Generally Moderately Productive

Locally Important Aquifer - Karstified

Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones

Poor Aquifer - Bedrock which is Generally Unproductive except for Local Zones

Poor Aquifer - Bedrock which is Generally Unproductive

Lake

0	1/12/2022	FINAL	MA	MO	RV	BF
Rev.	Date	Purpose of revision	Drawn	Check'd	Rev'd	Appr'd

Project
REGIONAL WATER RESOURCES PLAN SOUTH WEST

Drawing Title
HYDROGEOLOGY

Drawing Status
FINAL

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FIGURE 5.7

Appendix B MCA Environment Criteria Scoring Rules

B.1 Fine Screening MCA: Environmental Scoring Rules Applied

In the Framework Plan, Irish Water describe the Option Assessment Methodology that will be used to develop a national programme of proposed solutions for all of their water supplies. The solutions will be used to reduce or eliminate the Supply Demand Balance (SDB), Water Quality, Reliability and Sustainability risks.

The purpose of Irish Water's options assessment process is to consider the widest practicable range of solutions to resolve identified need within a given area. Environmental and social assessment criteria were included from the earliest stages of the screening process, with screening criteria being applied to filter out any options that are not feasible, or viable on environmental sustainability, resilience or deliverability grounds.

In the first stage of the options screening process the unconstrained options were identified to address need. These options were then subject to coarse screening against the criteria of resilience, deliverability and environment. Any unconstrained options were rejected at this stage if they were unviable in relation to one or more assessment criteria. The remaining options were progressed to further assessment through the fine screening process.

B.2 Fine Screening

The remaining options were subject to a more detailed Multi Criteria Assessment (MCA) at the Fine Screening Stage using desktop assessments of best available environmental data. The objective of the fine screening process is to ensure that all options which will progress to the feasible options list meet the following overarching criteria:

- Resilient;
- Feasible and Flexible;
- Progressible;
- Environmentally and socially viable; and
- Cost Effective.

These criteria were broken down into sub-criteria (see Table B-1) which were then rated between 3 and -3 depending on the option's impact (see Figure B-1).

For the environmental and social criteria, each topic was rated using specific rules covered in this Appendix to provide a basis for consistency and comparability. The fine screening process, assessment criteria and general scoring guide are provided in the Framework Plan. g

Major Positive / Beneficial	Moderate Positive / Beneficial	Minor Positive / Beneficial	Neutral / Negligible Risk	Minor Risk	Moderate Adverse Risk	Major Adverse Risk
3	2	1	0	-1	-2	-3

Figure B-1 Fine Screening Rating

B.2.1 Limitations

This is a high-level desk based assessment using option descriptions and indicative locations and routings. The scoring guidance and rules are intended to help provide a consistent approach across a

large number of options of different types and levels of information. The MCA is a comparative assessment and does not replace requirements for more detailed or project level assessment. Option costings are based on unit cost values and provide a consistent approach for option comparison, these costs do not include environmental mitigation costs at this stage and these would expect to be developed as part of option design and assessment for feasibility and planning consent stages.

B.3 MCA Scoring Criteria

These scoring rules focus on the environmental and social criteria and are based on the SEA objectives. They provide more detail to support consistent scoring and take account of data available and the range of options under consideration.

B.3.1 Sustainability (Environmental and Social Impacts)

The criteria for Sustainability (Environmental and Social impacts) and the questions used to rate options within the criteria for the fine screening are shown in Table B-1.

Table B-1 Fine Screening Sustainability (Environmental and Social Impacts) Criteria

SEA Objective /Topic Headings	Scoring Questions
Sustainability (Environmental and Social impacts)	
Population, health, economy and recreation	P1: Will the option impact public health and quality of life, during construction?
	P2: Will the option impact public health and quality of life, during operation?
	P3: What is the impact on recreational amenities?
Water Environment: Quality and Resources	W1: Would the option or associated construction activities affect WFD Status of water body status, in terms of quantity and quality for surface water?
	W2: Would the option or associated construction activities affect WFD Status of water body status, in terms of quantity and quality for groundwater?
	W3: Would the option or associated construction activities affect WFD Status of water body status, in terms of hydro morphology?
	W4: Would this option reduce pressure on water environment through water savings?
	W5: Is there a potential for this option to increase flood risk – e.g. increase base flow or result in loss of flood plain?
	W6: Will Navigation be affected?
Biodiversity, Flora and Fauna	B1: Potential to result in adverse effects on the integrity of a European site?
	B2: Potential to impact on Annex species outside designated areas?
	B3: Potential to impact on National designated sites?
	B4: Potential to impact Biodiversity in all other areas?
	B5: Risk of INNS?
Material Assets	M1: Will the option make effective use of existing assets?

SEA Objective /Topic Headings	Scoring Questions
	M2: Will this option conflict with critical infrastructure, or does the option conflict with existing business, planned land use or valuable agricultural land?
Landscape and Visual	L1: Could this option impact the landscape character areas, townscape character areas or important views – detract or improve?
Climate Change	CC1: What is the level of construction and operational carbon emissions associated with the option – tonnes?
Culture, Heritage and Archaeology	CH1: Does this option avoid direct damage to, or detract from the setting of, designated cultural heritage assets, or does this contribute to protecting them?
Geology and Soils	G1: Would any designated or non-designated geological features, valuable soils, or contaminated land sites be affected?

So that the criteria could be rated comparatively across the Study Areas and options, it was important that a set of rules were followed in the rating process. The rules for the Sustainability (Environmental and Social impacts) criteria are shown in Table B-2 - Table B-9.

B.3.2 Population, Economy, Tourism and Recreation, and Human Health

Table B-2 Fine Screening Questions for P1, P2 and P3

Fine Screening Question P1	Criteria	Data Sources	Score	
Will the option impact public health and quality of life, during construction?	• Level of concern about temporary risks to health, for example in relation to disturbance or loss of access due to construction or increased risk from poor water quality and risks of flooding during construction. • Ratings should be assigned relative to schemes/options under consideration rather than to absolute values. • Check GIS for impacts on roads/towns and whether they are urban/rural. • No construction would be for example an abstraction increase with no associated works.	• IW GIS layer on settlements and amenities • Consideration to scale of the option and sensitivity of the area • Are options located in close proximity to settlements (distance <2km)? • Are options routed through settlements?	3	N/A
			2	N/A
			1	N/A (no positive impact from construction works)
			0	No or minimal construction
			-1	Rural – small scale construction/upgrade and/or remote from sensitive receptors
			-2	Urban – large scale construction/upgrade and near sensitive receptors
			-3	No foreseeable -3 impact for this criterion. Construction impact expected to be temporary and subject to standard mitigation
Fine Screening Question P2	**Criteria**	**Data Sources**	**Score**	
	• Level of concern about risks to health, for example in	• IW GIS layers on settlements and amenities	3	N/A

Will the option impact public health and quality of life, during operation?	relation to water quality, water borne disease transmission, insect borne disease transmission, recreational and agricultural land take, and risks of flooding. • Ratings should be assigned relative to schemes/options under consideration rather than to absolute values. • Benefits: improved Level of service or water quality /access is an overall objective through options in combination. • Unlikely to be sufficient information for individual options on for allocation of +2/+3 scoring. Positive scores where WTPs on RAL are upgraded.	• Are options located in close proximity to settlements (distance <2km)? • Are options routed through settlements?	2	N/A
			1	Upgrades to WTP/new WTP likely to result in improved water quality/reliability
			0	Below ground assets in rural/urban area, upgrades to existing sites or new sites within industrial areas
			-1	New above ground assets in rural areas near sensitive receptors
			-2	New above ground assets in urban areas near sensitive receptors
			-3	Unlikely for individual options to score -3 as standard mitigation expected to be applied.
Fine Screening Question P3	**Criteria**	**Data Sources**	**Score**	
What is the impact on recreational amenities?	• Type of land take • Duration of land take • Level of impact on recreational amenity	• IW GIS layer for amenities (based on Failte Ireland information) and GIS layer for walking trails.	3	N/A
			2	N/A
			1	Potential for a net improvement to amenity provision (informal or formal recreation)

	• Improvement or creation of new recreation amenity (however this potential for should be improvement would need to be indicated in the option design. IW reservoirs for water supply normally have restrictions for recreational use this so cannot be assumed as a benefit for impoundments or bunded reservoirs for example)	• Is the option located within close distance of an amenity marked on the layer? • Layers may not accurately reflect all amenities in an area.	0	No change
			-1	Temporary amenity area loss/loss of access to amenity area during construction
			-2	Reduction/restriction of amenity
			-3	Permanent amenity area loss

* Extra costs associated

B.3.3 Water Environment: Quality and Resources

Table B-3 Fine Screening Questions W1, W2, W3, W4 and W5

Fine Screening Question W1	Criteria	Data Sources	Score	
Would the option or associated construction activities affect WFD Status of water body status, in terms of quantity and quality for surface water?	• Based on standards outlined in WFD: % of Q95 – detailed scoring guide takes account of WFD water body status and whether a river or lake waterbody. • Potential to contribute to meeting WFD objectives	• Catchments.ie for additional information on catchments • IW GIS layer for surface water WFD status. • Check Hydrotool/Hydronet to ensure that proposed abstraction is within 10% of Q95.	3	N/A
			2	N/A
			1	Option involves removing existing surface water abstraction identified as at risk of over abstraction
			0	=<5% Q95 OR No abstraction from surface water
			-1	5-7.5% Q95
			-2	7.5-10% Q95

	considered based on review of potential over abstraction risk from existing abstractions. • Unlikely to be sufficient information for allocation of +2/+3 scoring for individual options		-3	>10% of Q95 also preventing a return to good status*	
Fine Screening Question W2	**Criteria**	**Data Sources**	**Score**	**Bedrock**	**Gravels**
Would the option or associated construction activities affect WFD Status of water body status, in terms of quantity and quality for groundwater?	• % of average recharge. • WFD Assessment of Impact & Assignment of Risk Categories Table 4 • Option = Proposed Q [Ml/d] • Review of sustainability of groundwater abstractions • Unlikely to be sufficient information for allocation of +2/ +3 scoring for individual options	• Check underlying aquifer and 'Average Recharge' (GSI) • Groundwater Working Group Document No. 5, 2005)	3	N/A	N/A
			2	N/A	N/A
			1	Option involves removing existing groundwater abstraction identified as at risk of over abstraction	
			0	<2% OR No abstraction from groundwater	<2% OR No abstraction from groundwater
			-1	<10%	<20%
			-2	<20%	<30%
			-3	>20%	>30%
Fine Screening Question W3	**Criteria**	**Data Sources**	**Score**		
Would the option or associated construction activities affect		• Catchments.ie for additional information on catchments	3	N/A	
			2	N/A	

WFD Status of water body status, in terms of hydromorphology?	• Option type and its perceived effect on hydromorphology • Potential benefits from river restoration/ removal of barriers such as weirs where this is feasible and there is agreement with parties responsible for the structures. • Unlikely to be sufficient information for allocation of +2/+3 scoring for individual options	• IW GIS layer for groundwater WFD status, groundwater risk status, and surface water WFD status.	1	Option likely to contribute to WFD objectives by removing barriers or structures such as weirs or by including river restoration
			0	No change to hydromorphology
			-1	Lower intake on lake abstraction – new infrastructure
			-2	New river abstraction and intake structure
			-3	Impoundment option – online with loss of river channel
Fine Screening Question W4	**Criteria**	**Data Sources**	**Score**	
Would this option reduce pressure on water environment through water savings?	• Does the option include leakage reduction or a reduction in abstraction? • Positive score if option includes mains replacement reducing leakage or a reduction in abstraction – supporting objectives of use less and lose less. * • *Water savings options are not currently considered as Irish Waters leakage	• EPA Hydrometric data (initially) • Qube Model	3*	N/A
			2*	N/A
			1	Unlikely to be sufficient information to score positive benefits for water savings from individual options
			0	No water savings associated with this option
			-1	N/A

	reduction targets were included in their supply demand balance calculations for this iteration of the Framework Plan. • (note negative effects on environment addressed through criteria W1,2 3 and 4)		-2	N/A
			-3	N/A
Fine Screening Question W5	**Criteria**	**Data Sources**	**Score**	
Is there a potential for this option to increase flood risk – e.g. increase base flow or result in loss of flood plain?	• OPW Rules • Floodinfo.ie to determine whether option would result in loss of flood plain • Option supporting retention of water in upper catchment • Option providing storage capacity for flood water	• OPW online resource for flood mapping and previous flood events (not used at this stage) • Floodinfo.ie for flood mapping and previous flood events	3	Unlikely to be sufficient information for allocation of +3 scoring
			2	Unlikely to be sufficient information for allocation of +2 scoring
			1	Option provides additional flood storage or promotes retention of water in upper catchment
			0	No loss of flood plain or change to flood risk (e.g. upgrade of existing infrastructure)
			-1	Above ground asset adjacent to/on flood plain with potential for loss of flood plain or effect on drainage
			-2	Loss of flood storage area with some added risk of downstream flooding
			-3	Loss of flood storage area with potential added risk to downstream settlements/urban areas
Fine Screening Question W6	**Criteria**	**Data Sources**	**Score**	

Will Navigation be affected?	• Potential for impacts on navigable waterways – based on proximity of works to navigable waterways and type of works.	• Navigable Waterways GIS information	3	N/A
			2	N/A
			1	N/A
			0	No impact on navigable waterways expected
			-1	Navigation could potentially be affected by option such as a new abstraction on a navigable waterway but impacts likely to be avoidable through siting and design
			-2	Navigation could potentially be affected by option due to reduced water levels in navigable waterway
			-3	Navigation would potentially be affected by option due to proposed structures or reduced water levels in navigable waterways

B.3.4 Biodiversity, Flora and Fauna

Table B-4 Fine Screening Questions B1, B2, B3, B4 and B5

Fine Screening Question B1	Criteria	Data Sources	Score *	
Is there potential for the option to result in adverse effects on the integrity of a European site?	• Undermining the sites conservation objectives through direct or indirect effect pathways. • Direct loss of habitat or supporting habitat.	• NPWS GIS Database for European Designated sites including SACs and SPAs • SAC/SPA Conservation Objectives	3	N/A
			2	N/A
			1	Potential for benefits to designated site from removal or reduction of an impact - thereby improving the conservation status or condition of a European site.
			0	No potential for option to impact on European site

	• Mortality of Qualifying Interest species (QIs). • Changes to water quality, both qualitatively and quantitatively. • Changes in hydrology impacting on water dependant species and habitats (ground water dependant terrestrial ecosystems -GWDTE). • Unlikely to be sufficient information for allocation of +2 or +3 positive scoring for level of benefit		-1	Hydrological link to European site (SAC/SPA). No direct habitat loss within European site. No works within a European site. Potential for disturbance to QI species outside European site (e.g. mobile QI species otter, birds etc.). Impacts can be mitigated
			-2	No direct habitat loss within European site. Temporary works within or adjacent to European site or direct crossing of river European site. Potential for temporary disturbance to QI species within European site. Impacts can be mitigated
			-3	In some instances, impacts may not be fully known or understood without further detailed site assessment. Site assessment could identify potential adverse effects on site integrity (AESI) for which mitigation or alternative option may be required
Fine Screening Question B2	**Criteria**	**Data Sources**	**Score**	
Is there potential for the option to impact Annex I habitats or Annex II/ IV species outside European sites?	• Undermining the favourable conservation status of species and habitats listed on the annexes of the Habitats Directive (e.g. species and habitats listed in Article 17 reports). • Direct habitat loss • Disturbance to species	• NPWS GIS Layer - Ecosystem Provision • National Biodiversity Data Centre (NBDC) • NPWS Article 17 GIS Layer	3	N/A
			2	N/A
			1	Potential benefits to Annexed species through for example removal of obstructive weir or addition of fish pass
			0	No potential for option to impact on Annex I habitats or Annex II/ IV species
			-1	Disturbance to Annex I habitats or Annex II/ IV species

	• Disturbance to or loss of commuting or foraging habitat • Direct mortality of species • Unlikely to be sufficient information for allocation of +2 or +3 scoring of level of benefit			Disturbance to or loss of commuting or foraging habitat used by Annexed species
			-2	Direct mortality of Annexed species outside of European sites
			-3	Unlikely to be sufficient information for allocation of -3 scoring therefore level of negative impact currently not measurable
Fine Screening Question B3	**Criteria**	**Data Source**	**Score**	
Is there potential for the option to impact on a Nationally Designated site (e.g. NHAs, pNHAs).	• Undermining the conservation of national designated sites. • Direct impact on designated site (e.g. direct loss of habitat) • Disturbance (e.g. spread of invasive species from adjacent sites). • Unlikely to be sufficient information for allocation of +2 or +3 scoring of level of benefit	• NPWS GIS layer -NHAs, pNHAs. • GIS layer – foss wetland	3	N/A
			2	N/A
			1	Potential for benefits to designated site from enhancement or removal of an effect such as from an existing abstraction
			0	No impact on national designated sites expected
			-1	No direct loss of habitat within designated area. Indirect (temporary) impact.
			-2	Direct loss of habitat within designated area. Direct (permanent) impact.
			-3	No -3 scoring as there will be avoidance and/or mitigation to prevent significant impact on National Designated sites.
Fine Screening Question B4	**Criteria**	**Data Sources**	**Score**	
	• Outside of European and Nationally designated sites	• GIS layer – foss wetland/aerial photography	3	Potential to create new high value habitat on a large scale

Is there potential for the option to impact on Biodiversity in all other areas	• Loss of significant areas of ecologically valuable habitat and/or by undermining biodiversity objectives outlined in local or national plans (e.g. county development plans) • Direct habitat loss (e.g. hedgerows/woodlands other semi-natural habitats) • Disturbance to species protected under the wildlife act (e.g. badger, common frog, newts, nesting birds etc.) • Direct mortality of species protected under the wildlife act (e.g. badger, common frog, newts, nesting birds etc.) • Positive scoring for overall biodiversity enhancements where sufficient information is available for the options.	• National Biodiversity Data Centre (NBDC)	2	Potential to create new high value habitat on a small scale
			1	Potential to improve biodiversity through enhancement of existing habitat or improving connectivity
			0	No impact on biodiversity expected
			-1	Temporary loss of habitat or temporary disturbance to species.
			-2	Permanent loss of habitat and or direct mortality of species protected under the wildlife act.
			-3	No -3 scoring as there will be avoidance and/or mitigation to prevent biodiversity loss as included in the option design.
Fine Screening Question B5	**Criteria**	**Data Sources**	**Score**	
Is there potential for the option to spread invasive non-native species?	• Species listed on the third schedule of the Hab+A94:C102itats Regulations 2011, (S.I. 477)	• National Biodiversity Data Centre	3	N/A
			2	N/A
			1	N/A

	Regs 49 & 50 Prohibition on dispersal of certain species. • Presence of highly invasive species e.g. Japanese knotweed (JK), Himalayan balsam (HB), zebra mussel (ZM) etc). • Unlikely to be sufficient information for scoring positive benefits from removal of invasive species		0	No risk of spreading invasive species (e.g. tankering of water) OR no high risk options. Irish Water do not allow transfer of raw water between catchments
			-1	No major risk identified e.g. no records of key invasive (JK, HB, ZM etc.) identified on NBDC. However, site assessment would still be required to rule out presence of invasive at project level.
			-2	Risk identified e.g. records of key invasive species (JK, HB, ZM etc.) identified on NBDC.
				Significant cost to eradicate
				H.B. J.K. and aquatic species. Can mitigate for this however, associated time constraint and cost.
			-3	No high-risk options such as raw-water transfer are removed through Coarse Screening

* Score of -1, -2 or -3 = potential likely significant effects (LSEs) have been identified at fine screening stage in the absence of mitigation (stage 1 of the AA process cannot take mitigation into account).

0 score: those options scoring 0 are those unlikely to result in likely significant effects (LSEs) on a European site (based on desktop review). During the optioneering process Irish Water identify if these 0 scoring options meet the “Objectives of the Plan” and are assessed as having no potential impact on a European Site, it is automatically adopted as the Preferred Approach at WRZ level.

-1 score: potential for LSE (generally construction related impacts) identified. However, it is considered that these LSEs will not result in adverse effects on site integrity (AESI) with standard best practice project specific mitigation (for example pollution control compliant with legislation to protect the general environment and not always specifically for European sites or their qualifying interest features). These options are not considered to lead AESI based on the plan level rules/protective measures applied and desktop information available at the time of assessment.

-2 score: potential for LSE (generally construction related impact) identified. However, it is considered that these s LSEs will not result in AESI with standard best practice project specific mitigation. These options are not considered to lead AESI based on the plan level rules/protective measures applied and desktop information available at the time of assessment.

-3 score: potential for LSEs that may be harder to mitigate or where uncertainty around potential impacts remains (uncertainty may remain until site level assessments are carried out) and although deemed feasible through Stage 2, may require a higher burden of site based proof to succeed if it ever progresses to project level. As part of the feedback loop from the Natura Impact Statement for the Plan, any sites with a -3 score are noted and a better approach to these options identified where possible (e.g. an option that meets the Plan objectives and doesn't score -3). Where there are no options that meet this criterion the -3 options are progressed as the Preferred Approach. For such options mitigation in the form of avoidance is provided within the Plan, for example should potential adverse effects on European sites be identified at the project level from such an option the Plan will have identified other options that could be progressed at the project level if required.

B.3.5 Material Assets

Table B-5 Fine Screening Questions M1 and M2

Fine Screening Question M1	Criteria	Data Sources	Score	
Will the option make effective use of existing assets?	• Negatively scored if additional infrastructure required e.g. new WTP, pipeline, boreholes. • Neutral score if existing assets utilised • Positive score for improved efficiency and allowing decommissioning of old/failing assets • Unlikely to be sufficient information for allocation of +2 or +3 scoring of level of benefit	• IW GIS layers	3	N/A
			2	N/A
			1	Rationalisation of existing assets
			0	Component upgrade within existing site
			-1	Brownfield Site, WTP upgrade, new/replaced network <20km
			-2	Greenfield Site new WTP, new/replaced network 20-50km
			-3	New WTP with limited life span (e.g. Lough Talt). Significant above ground assets (desal), new/replaced network >50km
Fine Screening Question M2	**Criteria**	**Data Sources**	**Score**	
Will this option conflict with critical infrastructure, or does the	• IW GIS layer on land use can highlight areas where	• IW GIS layers • Myplan.ie	3	N/A
			2	N/A

option conflict with existing business, planned land use or valuable agricultural land. (see W6 for Navigation impact)	agricultural land may be disrupted. • IW GIS layer for existing water infrastructure • Cannot assess planned land use on IW GIS but can use Myplan.ie to check how land is zoned in a number of different areas • Cumulative impacts on other plans and projects will be assessed separately.		1	Unlikely to have positive impact
			0	No long term impact on critical infrastructure or operations – such as below ground assets where land can be reinstated
			-1	Loss of agricultural land. New above ground assets that will change land use
			-2	Loss to amenities, parks and designated sites or below ground works on land with strategic use.
			-3	Land with strategic use potential and above ground infrastructure

B.3.6 Landscape and Visual

Table B-6 Fine Screening Questions L1

Fine Screening Question L1	Criteria	Data Sources	Score	
Could this option impact the landscape character areas, townscape character areas or important views – detract or improve?	• Does the option entail new assets e.g. WTP, pipeline and boreholes? • Proximity to settlements • Are there any landscape considerations in this area? • Score more negatively if located in a sensitive landscape.	• Datasets/Documents exist for some counties (e.g. Wicklow) but no central map with all counties • IW GIS layers	3	Unlikely to be sufficient information for allocation of +3 scoring
			2	Unlikely to be sufficient information for allocation of +2 scoring
			1	Rationalisation involving removal of above ground structures
			0	No additional visual impact – such as upgrade within an existing site
			-1	Temporary View Impact i.e. construction of below ground assets
			-2	New above ground assets

Fine Screening Question L1	Criteria	Data Sources	Score	
			-3	New significant above ground assets in landscape amenity areas

B.3.7 Climate Change

Table B-7 Fine Screening Questions CC1

Fine Screening Question CC1	Criteria	Data Sources	Score	
What is the level of construction and operational carbon emissions associated with the option – tonnes?	• Carbon cost information to be used if available for fine screening otherwise scoring based on indicators of construction and operational scale from initial option descriptions • New large WTPs scored negatively based on energy requirements. • Energy intensive processes such as desalination and effluent reuse to be reflected in scoring • Note: Carbon calculations for embodied and operational carbon and NPV costings undertaken	• Option descriptions	3	N/A
			2	N/A
			1	N/A
			0	Small increases in abstraction at existing sites <10m3/d or small scale upgrades.
			-1	Increases in abstraction, pumping water through <20km of network, increase in abstraction to from 0.1 to 10Ml/d
			-2	Significant new/increases in abstraction (>10 to 50Mld), pumping water through >20-50km of network

Fine Screening Question CC1	Criteria	Data Sources	Score	
	after fine screening and used as an input for the approach development rather than the MCA carbon scoring. • There might be opportunity for reducing carbon through the use of renewable energy sources. If this information is not available for scoring it will be highlighted in the assessment for consideration either for a specific scheme or in relation to opportunities across a WRZ/study area/region.		-3	Significant new/increases in abstraction (>50Ml/d), pumping water through >50km of network or energy intensive treatment such as desalination

B.3.8 Cultural Heritage

Table B-8 Fine Screening Questions CH1

Fine Screening Question CH1	Criteria	Data Sources	Score	
Does this option avoid direct damage to, or detract from the setting of, designated cultural	• Is the option located in proximity distance of these sites?	• IW GIS layers for National Monuments in State Care and NIAHs	3	N/A
			2	N/A
			1	N/A

Fine Screening Question CH1	Criteria	Data Sources	Score	
heritage assets, or does this contribute to protecting them?	• Unknown archaeological risk is not scored at this stage but to be considered at later assessment stages. • Unlikely to be sufficient information to score any benefits such as improvements to access to sites.	• Online historic environment viewer	0	No or low risk to cultural heritage sites
			-1	New above ground assets close to heritage site (NIAH/SMR) – potential to detract from setting
			-2	New above ground/below ground asset close to heritage site (NIAH/SMR) that would not result in a loss of site but would involve a large amount of archaeological input
			-3	New above ground/below ground asset resulting in loss of NIAH/SMR site (e.g. a pipeline through an earthworks site)

B.3.9 Geology and Soils

Table B-9 Fine Screening Questions G1

Fine Screening Question G1	Criteria	Data Sources	Score	
Would any designated or non-designated geological features, valuable soils, or contaminated land sites be affected?	• Loss of valuable geological sites or risks from contaminated sites and loss of soils resources. • Lack of detail on design and routing at this stage so not possible to assess to sufficiently to compare options other than to check	• Online GSI database • IW GIS layers for soils, geological features	3	N/A
			2	N/A
			1	N/A
			0	No or low risk to geological heritage sites

Fine Screening Question G1	Criteria	Data Sources	Score	
	geological features are avoided. • Further assessment of impact on soils or risks from contaminated land would be required at a more detailed assessment stage.		-1	New above ground assets close to geological heritage site – potential to detract from setting. Some risk to archaeological interest from below ground construction
			-2	New above ground/below ground asset within geological heritage site that would not result in a loss of site but would involve a large amount of input
			-3	New above ground/below ground asset resulting in loss of geological heritage site

Appendix C Preferred Approaches for the Study Areas

Note: SA options are also known as ‘group options’

C.1 SAH Preferred Approach

WRZ	SAH Preferred Approach	
	Option Description	SA Option
1300SC0004: An Baile Mor/An Daingean	SAH-179 New SW abstraction from Milltown River and WTP	-
1300SC0007: An Fheothanach/An Mhuirioch/Baile Breach	SAH-122 Amalgamate all sources in WRZ to one WTP and rationalise smaller WTP - Upgrade an Fheothanach WTP	-
1300SC0003: An Mhin Aird	SAH-099 New GW abstraction in Dingle area to serve the customers currently served by An Mhín Aird Gualainn WTP	-
1300SC0002: Annascaul/Ballintermonb	SAH-173 WTP Upgrade - No deficit	-
1300SC0010: Ardfert North/Glenderry Ballyheigue WRZ	SAH-038 Increase Ballyheigue abstraction. Abandon existing borehole (BH) at Glenderry Well and rationalise WTP	-
1300SC0030: Aughacasla	SAH-138 New GW abstraction from Aughacasla BHs and upgrade existing Aughacasla WTP to supply deficit. Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones	-

WRZ	SAH Preferred Approach	
	Option Description	SA Option
1300SC0012: Brosna/Knocknagoshel PWSS 016F	SAH-225 Develop trial well at Brosna raw water pump house, upgrade WTP and undertake source protection works	-
1300SC0009: Castlegregory PWSS 024D	SAH-065 New SW abstraction from Lough Gill and upgrade Castlegregory WTP	-
1300SC0022: Ceann Tra PWS 074D	SAH-094 Increase GW abstraction from Ceann Trá WTP BHs (Local important aquifer) and upgrade Ceann Tra WTP	-
1300SC0026: Lios Cearnaigh PWS 052D	SAH-169 WTP Upgrade - No deficit	-
1300SC0024: Lyranes 303A	SAH-148 Increase GW abstraction from source Lyranes BH (local important aquifer) and upgrade Lyranes WTP	-
1300SC0025: Mountain Stage PWS 062A	SAH-170 New abstraction from Coomassaharn Lake, upgrade Mountain Stage WTP to treat	-
1300SC0008: An Clochlan	SAH-108 Increase GW abstraction at An Clochan. Ce Brennan and Clochan are connected - Could feed from either depending on where yield is	12
1300SC0028: Ce Bhreannain	SAH-108a Increase GW abstraction at An Clochan. Ce Brennan and Clochan are connected - Could feed from either depending on where yield is	12
1300SC0011: Listowel Regional PWS	SAH-162a New GW abstraction and interconnect Abbeyfeale	24

WRZ	SAH Preferred Approach	
	Option Description	SA Option
1900SC0021: Abbeyfeale WS	SAH-162 Interconnect Abbeyfeele and Listowel Regional WRZs	24
1300SC0013: Central Regional - Lough Guitane	SAH-177 New abstraction from Lower Leaneand WTP at abstraction to feed deficit in Central Regional and Mid Kerry	30
1300SC0015: Mid kerry	SAH-178 New abstraction from Lower Leaneand WTP at abstraction to feed deficit in Central Regional and Mid Kerry	30
1300SC0023: Waterville (SAI WRZ)	SAH-181 Increase abstraction from Lough Currane and supply Cahersiveen and Emlaghpeasta	31
1300SC0032: Cahersiveen	SAH-182 Rationalise Cahersiveen to Waterville, with Lough Currance abstraction increased to meet deficit	31
1300SC0016: Emlaghpeasta/Portmagee/Maulin	SAH-204 Rationalise Emlaghpeasta to Waterville, with Lough Currance abstraction increased to meet deficit	31
1300SC0005: Baile an Fheirtearaigh/Tir Abhainn Thoir/Cill Maoilcheadair/An Ghraig/Cloichear	SAH-187 Increase GW abstraction from Tobar Bhreandáin WTP BH (local important aquifer), upgrade Tobar Bhreandáin WTP and supply Dun Chaoin	33
1300SC0006: Dun Chaoin PWS 034D	SAH-186 Increase GW abstraction from Tobar Bhreandáin WTP BH and supply Ceann Tra	33

WRZ	SAH Preferred Approach	
	Option Description	SA Option
1300SC0031: Rathmore	SAH-215 Rationalise Rathmore WTP and connect to Central Regional WRZ and new SW source for central Regional	40

C.2 SAI Preferred Approach

WRZ	SAH Preferred Approach	
	Option Description	SA Option
0500SC0145: Bandon Regional	SAI-957 Interconnect with Cork City via Inniscarra	171
0500SC0070: Ballymakeera	SAI-011 New SW abstraction and upgrade WTP	-
0500SC0071: Clondrohid	SAI-855 Rationalise Clondrohid to Macroom WRZ	152
0500SC0059: Aghabullogue	SAI-942 Rationalise to Cork City WRZ	171
0500SC0178: Coolyhane	SAI-854 Rationalise Coolyhane to Macroom WRZ	152
0500SC0019: Ard Na Killy Ridge	SAI-050 Increase GW abstraction and upgrade WTP	-

WRZ	SAH Preferred Approach	
	Option Description	SA Option
0500SC0017: Nohoval	SAI-889 Rationalise Nohoval and Minane Bridge WRZs	163
0500SC0009: Ballingeary	SAI-060 Increase SW and upgrade WTP	-
0500SC0073: Ballinagree	SAI-954 Rationalise to Cork City WRZ	171
0500SC0013: Newcestown	SAI-083 Increase GW abstraction and rationalise Mossgrove to Newcestown WRZ	20
0500SC0016: Roberts Cove	SAI-964 Rationalise Roberts Cove and Minane Bridge WRZs	163
0500SC0074: Rylane	SAI-955 Rationalise to Cork City WRZ	171
0500SC0010: Carrignadoura	SAI-102 Upgrade existing WTP	-
0500SC0014: Mossgrove	SAI-105 Rationalise Mossgrove to Newcestown WRZ	20
0500SC0146: Clashanamid	SAI-960 Rationalise Clashanamid to Cork City WRZ (Innishannon WTP)	171
0500SC0171: Knockburden	SAI-940 Rationalise Knockburden to Cork City WRZ (Inniscarra WTP) via Cloughduv	171

WRZ	SAH Preferred Approach	
	Option Description	SA Option
0500SC0020: Cullen	SAI-951 Rationalise Cullen to Cork City WRZ (Inniscarra WTP)	171
0500SC0180: Ballyverane	SAI-853 Rationalise Ballyverane to Macroom WRZ	152
0500SC0058: Coolineagh	SAI-943 Rationalise to Cork City WRZ	171
0500SC0095: Knockanleigh	SAI-146 Upgrade existing WTP	-
0500SC0161: Tibbotstown	SAI-959 RationaliseTibbotstown to Cork City WRZ (Inniscarra WTP)	171
0500SC0042: Youghal Regional	SAI-830 New GW abstraction and new WTP	149
0500SC0184: Whitegate Regional	SAI-176 Increase GW abstraction and new WTP	-
0500SC0158: Cloyne	SAI-193 New GW abstraction and new WTP	-
0500SC0057: Donoughmore	SAI-212 New GW abstraction and upgrade WTP	-
0500SC0055: Grenagh	SAI-949 Rationalise Grenagh WRZ and Cork City WRZ (Inniscarra WTP) via Blarney	171
0500SC0085: Killeagh	SAI-837 Increase GW abstraction	150

WRZ	SAH Preferred Approach	
	Option Description	SA Option
0500SC0162: Mogeely	SAI-231 Increase existing GW abstraction	77
0500SC0051: Whitechurch	SAI-239 & SAI-240 Increase GW abstraction & new GW abstraction	-
0500SC0041: Ballymacoda	SAI-832 Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal (new GW source)	149
0500SC0047: Corbally	SAI-944 Rationalise Corbally to Inniscarra WTP	171
0500SC0084: Ballykilty	SAI-836 Rationalise Ballykilty to Killeagh WRZ	150
0500SC0050: Carrignavar	SAI-273a Increase existing GW abstraction	-
0500SC0048: Clash Leamleara	SAI-945 Rationalise Clash Leamleara to Inniscarra WTP via Corbally	171
0500SC0172: Ballyshoneen	SAI-952 Rationalise Ballyshoneen and Vicarstown to Inniscarra WTP	171
0500SC0167: Ballincurrig Lisgoold	SAI-946 Rationalise Ballincurrig Lisgoold WRZ to Inniscarra WTP	171
0500SC0044: Dungourney	SAI-293 Rationalise Dungourney WTP to Mogeely WRZ	77

WRZ	SAH Preferred Approach	
	Option Description	SA Option
0500SC0040: Kilcraheen	SAI-833 Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal (new GW source)	149
0500SC0046: Walshtown	SAI-947 Rationalise Walshtown to Inniscarra WTP	171
0500SC0053: Stoneview Blarney	SAI-950 Rationalise Stoneview to Cork City WRZ (Inniscarra WTP)	171
0500SC0039: Knockadoon	SAI-831 Rationalise Knockadoon, Ballymacoda and Kilcraheen to Youghal (new GW source)	149
0500SC0043: Inch	SAI-324 Increase existing GW abstraction	-
0500SC0021: Skibbereen 2 - Baltimore and Schull	SAI-888 Upgrade WTP	162
0500SC0030: Bantry	SAI-861 New Inchybegga Impoundment (Cullomane) and new WTP	155
0500SC0034: Castletownbere	SAI-865 Rationalise to Bantry	155
0500SC0012: Dunmanway	SAI-399 Interconnect Dunmanway and Drinagh WRZ	97
0500SC0068: Glengarriff	SAI-862 Rationalise to Bantry	155
0500SC0183: Kealkill	SAI-410 New SW abstraction and new WTP	-

WRZ	SAH Preferred Approach	
	Option Description	SA Option
0500SC0033: Adrigole	SAI-863 Rationalise to Bantry	155
0500SC0037: Dursey Island	SAI-768 New raw water storage for this WRZ	-
0500SC0038: Drinagh	SAI-434 Increase SW abstraction and update WTP	97
0500SC0027: Durrus	SAI-442 Increase GW abstraction and upgrade WTP	-
0500SC0031: Whiddy Island	SAI-450 New GW abstraction	-
0500SC0029: Dromore Bantry	SAI-455 Upgrade existing WTP	-
0500SC0024: Goleen	SAI-457 Increase SW abstraction and updage WTP	-
0500SC0069: Crosterra	SAI-468 Upgrade existing WTP	-
0500SC0035: Allihies	SAI-883 Rationalise Allihies to Ballydonegan GWS	160
0500SC0036: Cahermore	SAI-480 New GW abstraction and upgrade WTP	-
0500SC0168: Coppeen	SAI-486 Increase GW abstraction and upgrade WTP	-

WRZ	SAH Preferred Approach	
	Option Description	SA Option
0500SC0181: Reenmeen West	SAI-864 Rationalise to Bantry (new Inchybegga Impoundment source)	155
0500SC0007: Tarelton	SAI-508 Upgrade existing WTP	-
0500SC0082: Cork City	SAI-939 Increase abstraction and upgrade WTP	171
1300SC0019: Kenmare / Kilgarvan	SAI-630 New SW abstraction and new WTP	-
1300SC0018: Sneam PWS	SAI-643 Increase SW abstraction	-
1300SC0029: Kilgarvan	SAI-645 New GW abstraction and upgrade WTP	-
1300SC0027: Lauragh PWS	SAI-652 New SW abstractionand upgrade WTP	-
0500SC0153: Clonakilty	SAI-958 Interconnect with Cork City via Inniscarra	171
0500SC0026: Kilcrohane	SAI-660 New GW abstraction and new WTP	-
0500SC0179: Kilnagurteen Macroom	SAI-852 Rationalise Kilnagurteen (Macroom) to Macroom WRZ	152
0500SC0177: Macroom	SAI-851 Increase SW abstraction and new WTP	152

WRZ	SAH Preferred Approach	
	Option Description	SA Option
0500SC0008: Inchigeelagh	SAI-771 Upgrade existing WTP	-
0500SC0023: Toormore	SAI-498 New GW abstraction and upgrade WTP	-
0500SC0025: Crookhaven	SAI-784 Upgrade existing WTP	-
0500SC0028: Caheragh	SAI-772 Upgrade existing WTP	-
0500SC0054: Vicarstown	SAI-953 Rationalise Ballyshoneen and Vicarstown to Inniscarra WTP	171
0500SC0078: Kilnamartyra	SAI-774 Upgrade existing WTP	-
0500SC0081: Templemartin & Garranes	SAI-941 Rationalise Templemartin & Garranes to Cork City WRZ (Inniscarra WTP)	171
0500SC0083: Minane Bridge	SAI-890 New GW abstraction and upgrade WTP	163
0500SC0147: Ratharoon	SAI-778 Upgrade existing WTP	-
0500SC0152: Bayview	SAI-956 Rationalise to Cork City	171
0500SC0154: Lyre Clonakilty	SAI-779 Upgrade existing WTP	-

WRZ	SAH Preferred Approach	
	Option Description	SA Option
0500SC0155: Cape Clear	SAI-780 Upgrade existing WTP	-
0500SC0157: Bilberry	SAI-781 Upgrade existing WTP	-
0500SC0159: Midleton	SAI-948 Maintain allowable abstraction from Owenacurra River and supply deficit from Inniscarra	171
0500SC0169: Johnstown	SAI-526 Upgrade existing WTP	-
0500SC0170: Cluain Court Allihies	SAI-882 Rationalise Cluain Court Allihies to Allihies	-
0500SC0173: Skibbereen	SAI-887 Upgrade WTP and supply spare capacity	162
1300SC0017: Caherdaniel / Castlecove	SAI-641 Supplement Caherdaniel from Waterville	123
1300SC0023: Waterville PWS 075H	SAI-642 Increase abstraction	123

C.3 SAJ Preferred Approach

WRZ	SAJ Preferred Approach	
	Option Description	SA Option
0500SC0124: Castletownroche	SAJ-128 Conjunctive use of existing spring and trial well and upgrade existing Castletownroche WTP	-
0500SC0002: Conna Regional	SAJ-141 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-
0500SC0130: Lombardstown Glantane	SAJ-162 Increase GW abstraction from Kilgobnet (Spring) and upgrade Laharan Abbeys Well WTP to supply deficit	-
0500SC0066: Lyre	SAJ-167 Increase GW abstraction from Lyre spring and upgrade Lyre WTP to supply deficit	-
0500SC0126: Dromahane/Kilcolman/Cois Tobair	SAJ-188 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-
0500SC0004: Ballynoe	SAJ-223 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-
0500SC0105: Knockeragh	SAJ-262 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-
0500SC0061: Carrigcleena	SAJ-272 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-
0500SC0101: Mountain Barracks	SAJ-281 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-

WRZ	SAJ Preferred Approach	
	Option Description	SA Option
1900SC0018: Castletown/Ballyagran Water Supply	SAJ-287 Increase GW abstraction at Ballyagran BH and upgrade Ballyagran Pump Station WTP to supply deficit	-
3100SC0082: Aglish Cul Rua	SAJ-291 Upgrade existing WTP for water quality improvements	-
3100SC0016: Villierstown	SAJ-294 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-
3100SC0017: Camphire	SAJ-295 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-
3100SC0010: Strancally	SAJ-304 Upgrade existing WTP for water quality improvements. The WRZ is not in deficit	-
0500SC0185: Ballyclough & Mount North	SAJ-154 Increase GW abstraction from Mount North (spring) and upgrade Mountnorth WTP to supply spare capacity to neighbouring WRZ	20
0500SC0185: Ballyclough & Mount North	SAJ-155 Increase GW abstraction from Mountnorth & Ballyclough (spring) and upgrade Ballyclough WTP to supply spare capacity to neighboring WRZ.	20
0500SC0096: Boherascrub	SAJ-278 Rationalise Boherascrub to Ballyclough & Mount North WRZ	20
0500SC0102: Gortnaskehy	SAJ-260 Rationalise Gortnaskehy to Ballyheaphy WRZ	31

WRZ	SAJ Preferred Approach	
	Option Description	SA Option
3100SC0052: Ballyheaphy	SAJ-325 Increase GW abstraction from Ballyheaphy BH and upgrade Ballyheaphy WTP to supply spare capacity to neighboring scheme	31
0500SC0176: Fermoy	SAJ-396 Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP. Additional treatment is provided when the infiltration gallery floods	95
0500SC0122: Ballyvadonna	SAJ-397 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95
0500SC0165: Strawhall	SAJ-398 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95
0500SC0088: Knockdrumaclough	SAJ-399 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95
0500SC0089: Coolagown	SAJ-400 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95
0500SC0090: Kilmagnier	SAJ-401 Rationalise Ballyvadonna, Strawhall, Knockdrumalough, Coolagown and Kilmagnier to Fermoy WRZ	95

WRZ	SAJ Preferred Approach	
	Option Description	SA Option
0500SC0131: Mallow	SAJ-406 Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit	97
0500SC0182: Gortnagreige	SAJ-407 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0065: Ballinamona	SAJ-408 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0062: Monaparson	SAJ-409 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0006: Bottlehill	SAJ-411 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0128: Killavullen	SAJ-412 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0166: Knoppogue	SAJ-413 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0064: Monee & Knockabrack	SAJ-414 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97

WRZ	SAJ Preferred Approach	
	Option Description	SA Option
0500SC0186: Rahan	SAJ-415 Rationalise Gortnagreige, Ballinamona, Monaparson, Bottlehill, Killavullen, Knoppogue, Monee & Knockabrack and Rahan to Mallow	97
0500SC0109: Stagmount	SAJ-423 Rationalise Stagmount to Rockchapel WRZ	100
0500SC0108: Rockchapel	SAJ-424 Rationalise Stagmount to Rockchapel WRZ. Supply spare capacity.	100
0500SC0100: Mitchelstown	SAJ-425 Increase existing GW abstraction from Ballybeg BHs and new GW from no. TWs upgrade Mitchelstown South WTP to supply deficit. Improve interconnectivity between Mitchelstown North and Mitchelstown South WSZs	101
0500SC0099: Glenduff	SAJ-426 Rationalise Glenduff to Mitchelstown	101
3100SC0020: Tallow	SAJ-449 New GW abstraction in karstic region and new WTP to supply full demand	109
3100SC0106: Kilmore-Kilbeg	SAJ-450 Rationalise Kilmore-Kilbeg to Tallow WRZ	109
3100SC0121: Ballymoate Upper	SAJ-451 Rationalise Ballymoate Upper to Tallow WRZ	109
3100SC0007: Grallagh	SAJ-455 Increase GW abstraction from Grallagh BH and upgrade Grallagh WTP to supply deficit	111

WRZ	SAJ Preferred Approach	
	Option Description	SA Option
3100SC0084: Clashmore/Whitewell	SAJ-457 Rationalise Clashmore/Whitewell to Grallagh WRZ	111
3100SC0008: Tinkock/Tinnabinna	SAJ-458 Rationalise Tiknock/Tinnabina to Grallagh WRZ	111
0500SC0106: Labbamollogga	SAJ-461 Rationalise Labbamollogga to Ballylanders WRZs	113
0500SC0092: Kilmurry (Mitchelstown)	SAJ-462 Rationalise Kilmurry (Mitchelstown) to Inchinleamy WRZ	114
0500SC0056: Bweeng	SAJ-466 Rationalise Bweeng to Donoughmore WRZ	116
0500SC0175: Glanworth/Ballykenley/Johnstown	SAJ-467 New GW abstraction at Ballynacagheragh (no. 2 BHs - projected yield 2.2 MLD) and new WTP to supply deficit. New Storage at Dunmahon	117
0500SC0103: Knockanevin	SAJ-468 Rationalise Knockanevin to Glanworth/Ballykenley/Johnstown (WRZ)	117
0500SC0118: Ballyhooly	SAJ-511 Interconnect Fermoy and Conna Regional and supply deficit from Conna Regional. Increase SW abstraction from River Bride and upgrade Conna Regional WTP. Supply spare capacity to neighbouring WRZ in deficit	127
0500SC0118: Ballyhooly	SAJ-512 Increase GW abstraction from existing Spring and upgrade Castletownroche (Ballyhooley) WTP to supply deficit	127

WRZ	SAJ Preferred Approach	
	Option Description	SA Option
0500SC0121: Macroney	SAJ-513 New SW abstraction from Blackwater River and new WTP to supply deficit. Interconnect Ballyvadonna and Fermoy and supply deficit from new SW abstraction from River Blackwater at Fermoy	127
0500SC0107: Monabricka	SAJ-514 New SW abstraction from Blackwater River and new WTP to supply deficit. Rationalise Ballyvadonna to Fermoy WRZ (new SW abstraction from Blackwater River)	128
0500SC0114: Charleville/Doneraile	SAJ-515 Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP. Rationalise Ballyvadonna to Fermoy WRZ (increase existing GW abstraction)	129
0500SC0110: Castlewrixon	SAJ-516 Increase existing GW abstraction from infiltration gallery alongside Blackwater River and upgrade Coolrue WTP. Interconnect Ballyvadonna and Fermoy and supply deficit from increased GW abstraction at Fermoy	129
0500SC0104: Skahanagh	SAJ-517 Rationalise Castlewrixon and Skahanagh WRZs to Charleville/Doneraile WRZ	129
0500SC0113: Allow Regional	SAJ-518 New GW abstraction (karstic) and new WTP to supply full deficit. Decomission Freemount WTP	130
0500SC0144: Kilbrin Garran an Darra	SAJ-519 Rationalise Kilbrin Garran an Darra to Allow regional WRZ	130

WRZ	SAJ Preferred Approach	
	Option Description	SA Option
0500SC0136: Banteer	SAJ-521 Increase GW abstraction at Box Cross and upgrade Box Cross WTP to supply deficit. Rationalise Bottlehill to Mallow WRZ (Box Cross WTP)	131
0500SC0076: Glenleigh	SAJ-522 Interconnect Bweeng and Dromahane/Kilcolman/Cois Tobair WRZs and supply deficit from Dromahane/Kilcolman/Cois Tobair. Increase GW abstraction from Drommahane BH and upgrade Hammond Place WTP. Supply spare capacity to neighboring scheme in deficit. Increase GW abstraction from Cois Tobair BH and upgrade Cois Tobair WTP. Supply spare capacity to neighboring scheme in deficit	131
0500SC0075: Kilcorney	SAJ-523 Rationalise Bweeng to Dromahane/Kilcolman/Cois Tobair WRZ. Increase GW abstraction from Drommahane BH and upgrade Hammond Place WTP. Supply spare capacity to neighboring scheme in deficit. Increase GW abstraction from Cois Tobair BH and upgrade Cois Tobair WTP. Supply spare capacity to neighbouring scheme in deficit	131
0500SC0138: Millstreet	SAJ-525 Increase GW abstraction from existing Spring and upgrade Castletownroche (Ballyhooley) WTP to supply deficit. Interconnect Castletownroche with Ballyhooly WRZ and supply deficit	131
0500SC0143: Newmarket	SAJ-526 Increase GW abstraction from Charleville BHs and upgrade Charleville WTP to supply deficit. Rationalise Castlewrixon to Charleville for increased resilience and long term OPEX savings	131

WRZ	SAJ Preferred Approach	
	Option Description	SA Option
0500SC0143: Newmarket	SAJ-527 New GW abstraction from Ketragh Springs and new WTP to supply deficit (karstic region)	131
0500SC0139: Toureen_Derry	SAJ-528 Rationalise Toureen Derry to Banteer WRZ (approved)	131

Appendix D SEA Mitigation Measures

SEA options assessment assumes the implementation of standard mitigation measures, such as operation of water sources in line with regulatory requirements and the use of good construction practice. Examples of standard measures expected to be embedded in the design and development of infrastructure options are listed in Table D-1.

Table D-1 Embedded standard mitigation

Mitigation assumptions
Studies and surveys
Feasibility and scheme option studies, including detailed pipeline routing, siting and technology options to avoid effects on designated sites and species.
Studies, surveys and consultation on environmental effects of proposed development following relevant good practice guidance to inform design, identify relevant mitigation and to support appropriate planning permission, EIA and licencing processes.
Investigation, monitoring and modelling studies for groundwater and surface water abstractions to be agreed where relevant in context of schemes meeting WFD no deterioration requirements and RBMP objectives and to support AA requirements.
Short term/construction impacts
Local residents provided with due notice of construction works.
Ensure safe access for pedestrians, cyclists and equestrians, providing diversions where necessary.
Implementation of traffic management measures to minimise disruption to minor roads, including, where possible, limitation of works within peak periods or times.
Use of construction techniques that avoid or minimise disruption to major infrastructure and river crossings, such as directional drilling (where appropriate).
Any disruption to the road to be agreed in advance with transport authorities and traffic management plans to be used where needed.
No works to take place within curtilage of designated cultural heritage sites without necessary consents in place. Directional drilling where needed. Archaeological watching briefs during ground works where agreed as needed to address risk with planning authorities.
No works to take place within or in close proximity to designated sites without necessary consents in place and impacts to be avoided through detailed routing and trenchless construction approaches or timing to avoid disturbance where appropriate.
Appropriate permissions and consents to be obtained for all works which may affect a European protected species or nationally protected species.
A suitably qualified and experienced ecological clerk of works (ECoW) to carry out site supervision works during activities that affect sensitive habitats and species, ensure that site specific mitigation identified following surveys is undertaken.

Appropriate watercourse consents and environmental permits to be obtained for construction activities in or near water.
Consent for noisy works to be obtained and noise barriers used where required.
Best practice measures to control noise, air and water pollution in accordance with guidance.
Long-term mitigation (outside permanent footprints)
Full reinstatement of all footpaths and recreational areas.
Full reinstatement of all habitat types, including hedgerows, and provision of compensation habitat where appropriate.
All river abstraction points to be fitted with fish screens.
Full reinstatement of landscape features, and good management practice for the long-term restoration of landscape features.
Full restoration of agricultural land and previously undeveloped land.
Appropriate abstraction licence to be obtained for new, increased or traded licences.
New built infrastructure to incorporate the appropriate flood defence measures.

Table D-2 illustrates the mitigation measures that specifically respond to the significant environmental effects identified for each SEA topic within the three SAs of Region/Group 2.

Table D-2 Region/Group 2 significant impacts and corresponding mitigation measures

SEA Topic (abridged)	Significant Impact Identified in SEA	Mitigation Measures
Population & Health	Construction-stage disruption to access routes and recreational areas Construction-stage noise disturbance, dust and extra traffic Changes to drinking water quality caused by WTPs at risk of failure	• Regular community liaison • Construction Environmental Management Plan, Traffic Management Plan • Drinking water safety plans, catchment management, leakage reduction programmes, drought management actions – see EAP • Design of upgraded plant to meet drinking water standards
Water	Draw-down of groundwater levels caused by abstraction Abstraction of surface water with risk to reduce flow or water levels Impacts on water quality from surface water runoff or drawdown of water levels Increase in flood risk due to construction of new infrastructure or changes to	• All abstractions to be operated within the defined sustainability levels • Detailed studies required to determine abstraction regime that will not result in significant negative impacts on surface water or groundwater waterbody WFD status and how WFD objectives can be supported – see climate resilience measure below • Use of treatment and dispersal technologies appropriate to the source effluent and receiving waters • Improvements to residuals management

SEA Topic (abridged)	Significant Impact Identified in SEA	Mitigation Measures
	drainage affecting flood risk during operation.	• Implementation of best practice pollution prevention guidance, e.g. IFI 2016, CIRIA C532 • Emergency Pollution Response Plan • Environmental flow linked abstraction limits to minimise impact on summer low flows or fish migration periods • Catchment management to improve water quality where relevant • Locate new infrastructure away from areas of high flood risk. Where this is unavoidable, implement appropriate flood protection measures
Biodiversity	Loss or fragmentation of habitats within development footprint Disturbance to wildlife during construction Discharges of pollutants into water bodies and subsequent impacts on aquatic biodiversity Spread of invasive species during construction works	• Location and design of development to take account of designated sites or important habitats • Project level AA screening/AA required • Pre-construction Surveys/Seasonal Restrictions/ECoW • Ecology surveys, CEMPs and consultation to inform site-specific location, design and mitigation • Construction site reinstatement to include biodiversity enhancement and habitat connectivity measures where possible. • INNS Management Plan and biosecurity protocols in relation to water quality and biological sampling • Environmental flow linked abstraction limits to minimise impact on summer low flows or fish migration periods
Landscape	Impacts on local landscapes and visual amenity during construction	• Design of new plant to minimise visual effects and agree design with local authorities • Use landscape screening if appropriate, to reduce visual impacts during construction • Tree protection fencing • Lighting management • Link provision of biodiversity and land use reinstatement and enhancement to landscape opportunities where possible
Material assets	Disruption to infrastructure or access to infrastructure, access routes, public spaces and agricultural land	• Refine site locations and pipeline alignments to avoid built and natural assets • WRZ configuration – rationalisation opportunities for assets, waste and energy use, sustainable source use – see EAP
Climate change	Reduced resilience to climate change impacts	• Design criteria to emphasise climate change resilience • Prepare and implement a Climate Change Adaptation and Mitigation Strategy – see WSSP

SEA Topic (abridged)	Significant Impact Identified in SEA	Mitigation Measures
	Increase in greenhouse gas emissions	• Climate Sensitive Catchments Project, leakage reduction programmes, drought management actions – see EAP • Development of operational procedures for new groundwater abstraction which seek to limit abstraction volumes under conditions of environmental stress. Further research and assessment work required to inform development of operational procedures • Consider potential for use of renewable energy sources and energy efficiency measures to reduce carbon footprint during construction and operation
Cultural heritage	Loss or damage to cultural heritage assets within construction footprint	• Maintenance of access to cultural heritage assets during construction • Locations of known archaeological interest/value, or areas where archaeological work is planned, will be signposted/fenced off to avoid unintentional damage • Where a previously unknown heritage asset is discovered, or a known heritage asset proves to be more significant than foreseen at the time of application, the developer will inform the local planning authority and inform the project team of a solution that protects the significance of the new discovery, as far as practicably possible • Further cultural heritage and archaeological assessment and consultation to influence site location, design, pipeline alignment etc

Appendix E Environmental and Social Costs

E.1 Introduction

This methodology sets out the approach to estimating the environmental and social (E&S) costs for individual options for Irish Water. It uses an ecosystem services approach and uses both data relating to UK-based studies and Irish-based studies.

The aim of the calculations was to capture and value significant residual impacts in relation to ecosystem services. The availability of options data and robust ecosystem services values mean that potential impacts on three ecosystem services are valued:

- Climate regulation – woodland;
- Traffic impacts – opportunity cost of time due to road congestion from roadworks; and
- Food – crops and livestock.

(Note: Carbon emissions are addressed separately and are calculated alongside the construction and operational costs for the options).

Valuation of potential impacts on recreation and biodiversity were excluded from the E&S costs to avoid double counting, as potential effects on recreational amenities are captured within the Multi-Criteria Analysis (Environmental/Population, health, economy and recreation category).

There is the potential for additional ecosystem services categories to be captured within the E&S costs if additional time was available to undertake research into the availability of additional relevant studies.

As the actual route selection and site selection for the options has not yet been carried out, the E&S costs are based on the best available geographic information. A number of assumptions have been made in terms of land type and the size of the land take. Once route and site selection have taken place, the E&S costs can be refined to reflect this updated information.

The E&S costs were provided as a snapshot for one year – they are included in the EBSD model where they are discounted to produce the costs over the required time period.

The E&S costs are presented in 2018 prices, as 2018 is the most recent available data for the GDP deflator. If the E&S costs are required in a different base year to facilitate comparison of costs, assumptions could be made to convert them to the required base year.

The following section looks at individual impact categories in more detail.

E.2 Methodology

E.2.1 Climate regulation – woodland

The climate regulation/woodland impacts are calculated as an annual value – the impact of any woodland lost will continue to be felt in terms of loss of carbon sequestration.

The carbon sequestration rate per hectare of woodland is used to calculate the value of climate regulation for three categories of woodland – broadleaved, coniferous and mixed forest.

For coniferous and broadleaved, the values are calculated as weighted averages of the carbon sequestration rate for young and adult trees. The carbon sequestration rate is taken from the UK Forestry Commission's Woodland Carbon Code Carbon Look-Up Tables (2013) and is weighted by the

proportion of young and adult trees (UK Forestry Commission's National Inventory of Woodland and Trees, 2003).

The mixed forest carbon sequestration rate is the weighted average of the coniferous and broadleaved sequestration rates, based on the biomass stocks of living coniferous and broadleaved trees.

Table E-1 Carbon sequestration assumptions

Assumption	Value	Unit	Study year
Total area of young coniferous trees	84,221	Hectares	2003
Total area of adult coniferous trees	1,228,121	Hectares	2003
Total area of young broadleaved trees	26,879	Hectares	2003
Total area of adult broadleaved trees	510,299	Hectares	2003
Carbon sequestration rate for young coniferous trees	2.64	tCO_2e/ha	2013
Carbon sequestration rate for adult coniferous trees	4.47	tCO_2e/ha	2013
Carbon sequestration rate for young broadleaved trees	2.20	tCO_2e/ha	2013
Carbon sequestration rate for adult broadleaved trees	4.71	tCO_2e/ha	2013
Biomass stocks in living coniferous trees in GB	218	Million tonnes oven dry	2013
Biomass stocks in living broadleaved trees in GB	208	Million tonnes oven dry	2013

The non-traded value of carbon is used as there is no market for carbon sequestration – it is the social cost.

The carbon cost is taken from the PSC Central Technical References and Economic Appraisal Parameters document[1], published by the Department of Public Expenditure and Reform.

The non-trade price of carbon is uplifted to 2018 prices using the GDP deflator for Ireland published by the World Bank[2]; 2018 prices were selected, as this was the most recent year for the GDP deflator.

E.2.2 Traffic impacts – opportunity cost of time due to road congestion from roadworks

The traffic impacts are calculated as a one-off value – this is because these impacts will only be realised during construction.

The number of vehicles per day, speed of pipe laying and time of delay at roadworks for different road types are used with the average value of time per hour to calculate the cost of congestion.

The number of vehicles per day are taken from the UK Department for Transport's 'Road Traffic Estimates: Great Britain 2017'. The speed of pipe laying has been informed by professional judgement

[1] https://www.gov.ie/en/publication/public-spending-code/
[2] https://data.worldbank.org/indicator/NY.GDP.DEFL.ZS?locations=IE

and is assumed to be 30m/day. The time of delay at roadworks is presented by type of road – motorway, A road, B road, minor road – averaging the values for urban and rural roads[3].

Table E-2 Traffic assumptions

Assumption*	Value	Unit	Study year
Number of vehicles per day on a motorway (passing a reference point)	88,000	Vehicles	2017
Number of vehicles per day on an A road (passing a reference point)	35,500	Vehicles	2017
Number of vehicles per day on a B road (passing a reference point)	14,000	Vehicles	2017
Number of vehicles per day on a minor road (passing a reference point)	1,600	Vehicles	2017
Average time delay at road works for motorway	0.06	Hours/vehicle	2005
Average time delay at road works for A road	0.06	Hours/vehicle	2005
Average time delay at road works for B road	0.03	Hours/vehicle	2005
Average time delay at road works for minor road	0.004	Hours/vehicle	2005

*Road categories adapted where appropriate to reflect traffic levels

The average value of time per hour is calculated using the value of time from Transport Infrastructure Ireland's 'Project Appraisal Guidelines for National Roads Unit 6.11'[4], and apportioning it by the vehicle miles by type of vehicle for Great Britain[5]. Data for Ireland for vehicle miles was not readily available. This produced an estimate for the value of time per hour for an average vehicle.

The length of pipe laid which intersects different types of road was provided through GIS data.

E.2.3 Food – crops and livestock

The food/crops and livestock impacts are calculated as an annual value – the impact of any agricultural land lost will continue to be felt in terms of loss of productive agricultural land.

The area of land take for each option was calculated using information on the proposed new infrastructure – water treatment plants, desalination plants, pumping stations, groundwater treatment plants, boreholes and reservoirs. As the geographic information for each option is only indicative at this stage, it was assumed that all of the proposed land take was agricultural land.

The value of the agricultural land was calculated using information on the indicative monetary estimates of the gross margins (£/hectare) for selected crops from the Multi-Coloured Manual[6]. An average of the gross margin for different arable land types was used.

[3] Goodwin, P. (2005) Utilities' street works and the cost of traffic congestion, London, National Joint Utilities Group. Available at: http://www.njug.org.uk/wp-content/uploads/93.pdf
[4] https://www.tiipublications.ie/library/PE-PAG-02030-01.pdf
[5] Data table TRA4213 in Department for Transport (2017) 'Road Traffic Estimates: Great Britain 2017' available from https://www.gov.uk/government/statistics/road-traffic-estimates-in-great-britain-2017
[6] https://www.mcm-online.co.uk/handbook/

Table E-3 Agricultural land MCM assumptions

MCM group	Gross margin (£/ha) 2017 prices	MCM group assumption
Winter wheat	758	Assumes 9t/ha
Extensive arable	741	Assumes wheat 70%, oil seed rape 20%, beans 10% by area
Intensive arable	1370	Assumes wheat 66%, sugar beet 17%, potatoes and vegetables 17% by area

This was uplifted to 2018 prices using the GDP deflator for Ireland published by the World Bank[7]. 2018 prices were selected, as this was the most recent year for the GDP deflator. It was converted to euros using the Bank of England's euro/sterling spot exchange rate[8].

[7] https://data.worldbank.org/indicator/NY.GDP.DEFL.ZS?locations=IE

[8] https://www.bankofengland.co.uk/boeapps/database/fromshowcolumns.asp?Travel=NIxSUx&FromSeries=1&ToSeries=50&DAT=RNG&FD=1&FM=Jan&FY=2010&TD=28&TM=Jul&TY=2020&FNY=&CSVF=TT&html.x=167&html.y=37&C=DMD&Filter=N

Appendix F Policy, Plan and Programme Review

F.1 National and regional level

Theme	Policies, Plans and Programmes
All aspects	1. EU Sustainability Policy 2. UN Sustainable Development Goals 3. Our Sustainable Future, a Framework for Sustainable Development for Ireland 4. Strategic Environmental Directive (2001/42/EC) 5. European Communities (Environmental Assessment of Certain Plans and Programmes) Regulations 2004 S.I. No. 435/2004 (as amended 2011 S.I. No. 200/2011) 6. Planning and Development (Strategic Environmental Assessment) Regulations 2004 S.I. No. 436/2004 (as amended 2011 S.I. No. 201/2011) 7. Environmental Impact Assessment Directive (2014/52/EU) 8. European Union (Planning and Development) (Environmental Impact Assessment) Regulations 2018 S.I. No. 296/2018 (as amended S.I. No. 646/2018) 9. Environmental Liability Directive (2004/35/EC) 10. European Communities (Environmental Liability) Regulations 2008 S.I. No. 547/2008 (as amended 2015 S.I. No. 293/2015) 11. European Green Deal 12. Water Services Act, 2013 (as amended 2017) 13. Ireland 2040: Our Plan, National Planning Framework 14. Water Services Policy Statement 2018 - 2025 15. National Spatial Strategy for Ireland 2002-2020 (Department of the Environment and Local Government, 2002) 16. Regional Spatial and Economic Strategies 17. Planning and Development Act 2000 (as amended) 18. Planning and Development Regulations 2001 (as amended) 19. Capital Investment Plan 2016-2021 20. Climate Action Plan 2023 21. Ireland's Environment - An Integrated Assessment 2020
Population, economy, tourism and recreation and human health	22. Aarhus Convention 23. Drinking Water Directive (2020/2184) 24. European Union (Drinking Water) Regulations 2014 S.I. No. 122/2014 (as amended 2017 S.I. No. 464/2017) 25. EPA Drinking Water Advice Note No. 8: Developing Drinking Water Safety Plans (2011) 26. Groundwater Protection Schemes (1999)

Theme	Policies, Plans and Programmes
	27. World Health Organization Guidelines for Drinking Water Quality (4th edition, 2017) 28. Water safety plan manual: step-by-step risk management for drinking-water suppliers (2009) 29. Irish Water - Water Services Strategic Plan 2015 30. Irish Water - National Wastewater Sludge Management Plan 31. Irish Water - Lead in Drinking Water Mitigation Plan 32. Healthy Ireland Framework 2019-2025 33. Agri-Food Strategy 2030 34. Food Vision 2030 35. Food Wise 2025 36. Food Harvest 2020 37. Fàilte Ireland's 10 Year Tourism Strategy 38. Fàilte Ireland Visitor Experience Development Plans 39. EU Tourism Policy 40. National Countryside Recreation Strategy 41. Tourism Policy Statement 42. Tourism Development and Innovation. A Strategy for Investment 2016-2022 43. Tourism Action Plan 2019-2021 44. Waterways Ireland Tourism Masterplan for the River Shannon 2020-2030
Water environment	45. Water Framework Directive (2000/60/EC) 46. European Communities (Water Policy) Regulations 2003 S.I. No. 722/2003 (as amended 2010 S.I. No. 326/2010) 47. European Union (Water Policy) (Abstractions Registration) Regulations 2018 (S.I. No. 261/2018) 48. River Basin Management Plan 2018 - 2021 49. River Basin Management Plan 2022-2027 50. General Scheme of the Water Environment (Abstractions) Bill 2020 51. Bathing Water Directive (2006/7/EC) 52. Bathing Water Quality Regulations 2008 S.I. No. 79/2008 (as amended 2016 S.I. No. 163/2016) 53. Floods Directive (2007/60/EC) 54. European Communities (Assessment and Management of Flood Risks) Regulations 2010 S.I. No. 122/2010 55. Nitrates Directive (91/676/EEC and derogation 2018/209) 56. European Union (Good Agricultural Practice for Protection of Waters) Regulations 2014 S.I. No. 31/2014 (as amended 2020 S.I. No. 529/2020) 57. Urban Wastewater Treatment Directive (91/271/EEC as amended 98/15/EEC)

Theme	Policies, Plans and Programmes
	58. Urban Waste Water Treatment Regulations 2001 S.I. No. 254/2001 (as amended 2010 S.I. No. 48/2010) 59. Marine Strategy Framework Directive (2008/56/EC) 60. European Communities (Marine Strategy Framework) Regulations 2011 S.I. No. 249/2011 (as amended 2018 S.I. No. 648/2018) 61. Groundwater Directive (2006/118/EC) 62. European Communities Environmental Objectives (Groundwater) Regulations 2010 S.I. No. 9/2010 (as amended 2016 S.I. No. 366/2016) 63. Catchment Flood Risk Management (CFRAM) Programme 64. Flood Risk Management Plans 65. Fourth Nitrates Action Programme 66. National Marine Planning Framework 67. Maritime Spatial Planning Directive 2014/89/EU 68. Marine and Coastal Access Act 2009 69. UK Marine Strategy
Biodiversity, flora and fauna	70. International and European Council Conventions 71. EU Biodiversity Strategy for 2030 72. The Habitats Directive (92/43/EEC) 73. The Birds Directive (2009/147/EC) 74. European Communities (Birds and Natural Habitats) Regulations 2011 S.I. No. 477/2011(as amended 2015 S.I. No. 355/2015) 75. Green Infrastructure: Enhancing Europe's Natural Capital Strategy 76. Creating Green Infrastructure for Ireland: Enhancing Natural Capital for Human Wellbeing 77. Wildlife Act 1976 (as amended including 2010) 78. Fisheries Consolidation Act, 1959 79. Other National Biodiversity related regulations 80. National Biodiversity Action Plan 2017-2021 81. All-Ireland Pollinator Plan 2021-2025
Material assets	82. Waste Framework Directive (2008/98/EC) 83. Infrastructure and Capital Investment Plan 2016-2021 84. Waste Management Acts 1996 – 2005 85. Ireland 2040: Our Plan, National Planning Framework 86. National Peatland Strategy 87. Forestry Programme 2014-2020 88. Waste Action Plan for a Circular Economy 89. National Hazardous Waste Management Plan 2014-2020

Theme	Policies, Plans and Programmes
	90. National Hazardous Waste Management Plan 2021 – 2027
Landscape and visual amenity	91. European Landscape Convention 92. National Landscape Strategy for Ireland 2015-2025
Air quality	93. Ambient Air Quality Directive (2008/50/EC) 94. Air Quality Standards Regulations 2011 S.I. No. 180/2011 95. Industrial Emissions Directive (2010/75/EU) 96. European Union (Industrial Emissions) Regulations 2013 S.I. No. 138/2013
Noise	97. Environmental Noise Directive (2002/49/EC) 98. European Communities (Environmental Noise) Regulations 2018 S.I. No. 549/2018
Climate change	99. The Kyoto Protocol 100. Paris Agreement 2015 101. EU Energy and Climate (2020) Package 2009 102. The Climate Action and Low Carbon Development Act 2015 103. Climate Action and Low Carbon Development (Amendment) Bill 2021 104. National Climate Change Adaptation Framework including the Sectoral Adaptation Plans including the Climate Change Adaptation for the Health Sector 2018-2024 105. Ireland's National Policy Position on Climate Action and Low Carbon Development (2014) 106. National Mitigation Plan, 2017 107. Energy White Paper: Delivering a Sustainable Energy Future for Ireland – The Energy Policy Framework 2007-2020 108. National Renewable Energy Action Plan (Directive 2018/2001) 109. European Union (Renewable Energy) Regulations 2020 S.I. No. 365/2020 110. Offshore Renewable Energy Development Plan (2014) and Interim Review (2018) 111. Irish Water Sustainable Energy Strategy 112. National Climate Action Plan 2023 113. European Green Deal
Cultural heritage (archaeological and architectural)	114. EU Conventions on Archaeological, Architectural and Cultural Heritage 115. Planning and Development Acts 116. Heritage Act 2018 117. National Monuments Act 2004 (as amended) 118. Architectural Heritage and Historic Monuments Act 1999
Geology and soils	119. Planning and Development Act 120. Action Plan for Rural Development

Theme	Policies, Plans and Programmes
Transboundary	121. Planning Act (NI) 2011 122. Regional Development Strategy: Building a Better Future, 2035 123. Northern Ireland's Climate Change Adaptation Programme 2019 – 2024 124. Climate Change Act (Northern Ireland) 2022 125. Climate Risk Independent Assessment 2021 126. The Water Environment (Floods Directive) Regulations (Northern Ireland) 2009 127. Water Abstraction and Impoundment (Licensing) (Amendment) Regulations (Northern Ireland) 2007 128. The Water Supply (Water Quality) Regulations (Northern Ireland) 2017 129. NI Water (2020) Our Strategy 2021-2046 130. NI Water (2020) Water Resource and Supply Resilience Plan 131. The Private Water Supplies Regulations (Northern Ireland) 2017 132. Sustainable Water – A Long term water strategy for Northern Ireland (2015 – 2040) 133. Fisheries Act (NI) 1966 (as amended) 134. NI Flood Risk Management Plan 2021-2027 135. Marine Act (Northern Ireland) 2013 136. UK Marine Policy Statement 137. Marine Plan for Northern Ireland 138. Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995 139. Protection of Wrecks Act 1973 140. Archaeology 2030 - A Strategic Approach for Northern Ireland 141. 3rd cycle River Basin Management Plan 2021-2027 142. The Wildlife (NI) Order 1985 (as amended) 143. Wildlife and Natural Environment Act (NI) 2011 144. The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) 145. The Environment (NI) Order 2002 146. The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 147. The Strategic Planning Policy Statement (SPPS) for Northern Ireland 148. Planning Policy Statements (will be superseded by Local Development Plans when adopted) 149. Biodiversity Strategy for NI to 2020 150. Environment Strategy 151. The NI peatland policy 152. Strategic Planning Policy Statement 153. Northern Ireland Landscape Character Assessment

Theme	Policies, Plans and Programmes
	154. Regional Landscape Assessment 155. The Green Growth Strategy Consultation on the Green Growth Strategy for Northern Ireland 156. Northern Ireland Energy Strategy 2050 Northern Ireland Energy Strategy 2050 157. Wildlife (Northern Ireland) Order 1985 158. Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 159. The Marine and Coastal Access Act 2009 160. Strategic Planning Policy Statement for Northern Ireland 2015 161. An Integrated Coastal Zone Management Strategy for Northern Ireland 2006-2026 162. Northern Ireland Regional Seascape Character Assessment 2014 163. North Atlantic Salmon Conservation Organisation (NASCO) 164. Convention for the Conservation of Salmon in the North Atlantic Implementation Plan for the period 2019 – 2024 165. Northern Ireland Marine Plan (2018) 166. Policy Statement on Geothermal Energy for a Circular Economy

F.2 Local level

Theme	Policies, plans and programmes
All aspects	167. Kerry County Development Plan 2015-2021 (adopted) 168. Kerry County Development Plan 2022-2028 (adopted) 169. Limerick Development Plan 2022-2028 (emerging) 170. Limerick City Development Plan 2010-2016 (adopted) 171. Cork City Development Plan 2022-2028(emerging) 172. Cork City Development Plan 2015-2021 (adopted) 173. Cork County Development Plan 2014 (adopted) 174. Cork County Development Plan 2022 175. Waterford City and County Development Plan 2022-2028 (emerging) 176. Waterford County Development Plan 2011-2017 (emerging) 177. Waterford City Development Plan 2013-2019 (adopted) 178. Tipperary County Development Plan 2022-2028 (emerging) 179. County Tipperary Local Development Strategy 2014- 2020 (adopted)
Population, economy, tourism and recreation and human health	180. County Kerry Tourism Strategy & Action Plan 2016-2022 181. Healthy Kerry Framework 2021-2027 182. Limerick Tourism Development Strategy 2019-2023 183. Cork Healthy Cities Action Plan 2020-2030

Theme	Policies, plans and programmes
	184. Waterford City and County Council Tourism Statement of Strategy and Work Plan 2017-2022 185. Tipperary Tourism Marketing, Experience and Destination Development Plan 2016-2021 186. A Strategy for a healthy Tipperary 2018-2020
Biodiversity, flora and fauna	187. Limerick City Council Biodiversity Plan 188. Killorglin, County Kerry Biodiversity Action Plan 2014 189. County Cork Biodiversity Action Plan 2009-2014 190. Cork County Council Environmental Awareness Strategy 2016-2020 191. Cork City Heritage and Biodiversity Plan 2021-2026 192. Waterford City Biodiversity Action Plan 2010 193. County Waterford Local Biodiversity Action Plan 2008-2013 194. North Tipperary Local Biodiversity Action Plan 2007 195. South Tipperary Biodiversity Action Plan 2010-2015
Material assets	196. Southern Region Waste Management Plan 2015-2021 197. Southern Region Waste Plan 2014
Landscape and visual amenity	198. Cork City Landscape Study 2008 199. Landscape Character Assessment of Tipperary 2016 200. Tipperary Landscape Character Assessment 2006 201. Kerry County Council Corporate Plan 2019-2024
Noise	202. Limerick City and Council Noise Action Plan 2018-2023 203. Kerry County Council Noise Action Plan Round 3 2019 204. Cork County Council Noise Action Plan 2018-2023 205. Waterford City and County Council Noise action Plan 2019-2023 206. Tipperary County Council Noise Action Plan 2018-2023
Climate change	207. Tipperary Renewable Energy Strategy 2016 208. Tipperary County Council Climate Adaptation Strategy 2019-2024 209. Tipperary Sustainable Energy Action Plan 2017-2020 210. Cork County Council Climate Adaptation Strategy 2019-2024 211. Cork City Climate Change Adaptation Strategy 2019-2024 212. Cork City Sustainable Energy and Climate Action Plan 213. Cork County Council Environmental Awareness Strategy 2016-2020 214. Limerick City and County Council Climate Change Adaptation Strategy 2019-2040 215. Kerry County Council Climate Change Adaptation Strategy 2019- 2024 216. Waterford City and County Council Climate Change Adaptation strategy 2019-2024

Theme	Policies, plans and programmes
Cultural heritage (archaeological and architectural)	217. Limerick City Walls Conservation Management Plan (2008) 218. County Cory Heritage Plan 2005-2010 219. Cork City and Heritage and Biodiversity Plan 2021-2026 220. Tipperary heritage Plan 2017-2021 221. Limerick heritage Plan 2017-2030 222. Tipperary Town Heritage Action Plan 2021-2022 223. Waterford Heritage Plan 2017-2022 224. Waterford City Heritage Plan 2006-2010 225. County Waterford Heritage Plan 2006-2010

Note: there are no local levels plans specific to the water or geology and soils topic areas. Plans of this nature tend to be regional or national level.

Appendix G SEA Scoping Consultation Responses

Consultee	Submission comment	Response
General comments		
Environmental Protection Agency	A note that in reference to the relevant aspects of Chapter 7 of the SOER2020, Irish Water needs to consider water quality in the identification of deficiencies and needs in relation to water supply.	Identification of water quality deficiencies and needs in relation to water supply have been considered and referenced within SEA Report and the RWRP and the assessment of deficiencies has informed the identification of solution to address water quality treatment needs as well as quantity.
Environmental Protection Agency	It is recommended that SEA aligns with the relevant objectives and policy commitments of the National Planning Framework, the Regional Spatial and Economic Strategy, national commitments on climate change mitigation and adaptation, as well as any relevant sectoral, regional and local adaptation plans. A schematic presenting these links and inter-relationships is recommended.	SEA Report has taken into account the policy commitments in the general approach taken and the SEA objectives and assessment methodology. The NPF and RSES as well as relevant national, regional and sectoral climate adaptation and mitigation plans are included as key influences. A schematic showing these links is now included in SEA Environmental Report and the RWRP-NW.
Environmental Protection Agency	A recommendation for implementation of, annual or biannual report publications in between review periods for the Plan as well as aligning Plan implementation monitoring and reporting with the environmental monitoring required under the SEA legislation.	A commitment to undertake annual reviews is included in the recommendation to provide feedback and progress reporting against the environmental monitoring plan and is included as part of the monitoring and feedback process committed to in the RWRP-NW.
Environmental Protection Agency	A note that the SEA-related monitoring should address positive, negative and cumulative effects where they are likely to occur and should include provision for on-going review to facilitate an early response to any environmental issues that may arise. The Environmental Report should specify the monitoring frequency and responsibilities and include provisions for reporting on the monitoring. To avoid duplication in data collection, the same indicators	Text added to SEA Report to clarify that the monitoring plan covers positive, negative and cumulative impacts. Annual reviews of implementation progress and environmental effects are identified along with responsibilities. These are integrated with the wider plan related monitoring and feedback.

Consultee	Submission comment	Response
	should be used for the plan-related and SEA-related monitoring where possible.	
Environmental Protection Agency	A recommendation to align the five-year review cycle for the Plan with reviews of other similar plans such as the River Basin Management Plan, Regional Economic and Spatial Strategies and National Planning Framework. The review cycle should also reflect the timing of the five-year Long-Term Climate Strategies, a requirement of the forthcoming Climate Action and Low Carbon Development (Amendment) Bill. Although some of the plans are referenced throughout the scoping report, timing of the reviews will be crucial to maximise multiple benefits and/or the identification of stressors. Aligning the reviews of the various plans would allow for plan makers to address the issues using a holistic approach.	The plans will be subject to ongoing review within the 5year plan cycle including annual review and the changes to related plans and policies and legislation or emerging issues will be part of this ongoing review and to allow early responses to influence plan making along with engagement in the respective consultation processes.
Environmental Protection Agency	A suggestion that further detail should be provided in the Environmental Report on the relevant environmental assessments to be carried out at the project stage and relevant mitigation measures to be applied, as appropriate. There may be merit in exploring this issue further with the relevant Environmental Authorities during the Plan preparation and SEA processes.	Added additional sentence in section 10.1 Mitigation Measures 'Standard and specific mitigation measures identified include recommendations for further environmental assessment work to be undertaken at project stage to inform further inform mitigation development ' SEA recommendations include seeking catchment management schemes and aiming to build in and environmental enhancement opportunities into the project stage such as nature based solutions carbon reduction, zero carbon emissions targets, biodiversity enhancement and river restoration.
Environmental Protection Agency	A recommendation for the Plan to include a commitment to implement the environmental monitoring programme and associated reporting. We suggest including a separate section on ‘Monitoring, Review and Reporting’ in the Plan, setting out the provisions for monitoring and reporting on the implementation of the Plan and periodic reviews. There may be merits in aligning the periodic reviews of the Plan with existing cyclical reporting e.g. Ireland’s Environment, National Planning Framework,	We have included chapter 10, Mitigation and Monitoring Plans which covers the integration of environmental and sustainability considerations throughout implementation of the Regional Plan. The plans will be subject to ongoing review within the 5year plan cycle including annual review and the changes to related plans and policies

Consultee	Submission comment	Response
	Water Framework Directive, Marine Strategy Framework Directive, etc.	and legislation or emerging issues will be part of this ongoing review and to allow early responses to influence plan making along with engagement in the respective consultation processes.
Environmental Protection Agency	All recommendations from the SEA and Appropriate Assessment processes, including mitigation measures, should be integrated in the Plan. We recommend that the Plan includes summary tables outlining the key findings of the SEA and linking the significant environmental effects identified to Plan policies/measures, proposed mitigation measures and monitoring programme.	Both the SEA and the Plan address this and further details have now been added in the mitigation and monitoring sections and these are presented as s for consultation and comments are welcomed.
Environmental Protection Agency	The Plan should clearly set out the scope, remit and implementation related elements of the Plan. These will have implications for the SEA, in terms of guiding the level of assessment applicable at the appropriate level for the Plan. Where it is envisaged that measures proposed in the Plan will be implemented via other plans, which themselves have been or will be subject to SEA, this should be explained in the Environmental Report and taken into account in the assessment, e.g. interactions between the Plan and other regional water resources plans.	The Environmental Action Plan (EAP) set out in Table 10.1 of the SouthWest SEA Report summarises the actions and areas of further study identified in the Environmental Report. The EAP provides a basis for tracking recommendations from the SEA during the NWRP implementation.
Northern Ireland Environment Agency	The Department of Agriculture, Environment and Rural Affairs Northern Ireland would like the SEA Environmental Report to contain a clear statement indicating the opinion about whether or not the implementation of the of the strategy is likely to have a significant effect on Northern Ireland, in combination with any identified measures envisaged to prevent, reduce and as fully as possible offset any significant adverse effects on the environment.	The potential for significant effects on the environment of Northern Ireland has been considered as part of the options and cumulative assessment and a statement on the conclusions is included in the SEA Environment Report.
Northern Ireland Environment Agency	Marine and Fisheries Division recommends that in the Scope of Assessment and SEA Objectives tables the water environment considers the hydrologically linked marine environment, that Landscape and Amenity considers seascape and that climate change mitigation and adaptation considers Nature based solutions.	The assessment includes consideration of the marine environment including seascape where relevant to the options. Irish Water recognises the increasing importance of nature-based solutions and catchment measures in relation to improving water quality and reducing risk across our supplies. Irish Water is

Consultee	Submission comment	Response
		an active participant in catchment-based initiatives and where possible will incorporate NBS solutions at project level. These aspects are also incorporated in the SEA EAP and Monitoring Plan.
Northern Ireland Environment Agency	The Marine Plan Team (MPT) stresses the importance of full marine consideration in the ongoing progression of the associated SEA process. The MPT would consider that by not fully exploring/referencing the relevant marine aspects within this iterative scoping document and AA screening, then it may be the case that the opportunities for the marine area and potential associated transboundary issues will not be fully considered at the Environmental Report stage. In accordance with Article 6(3) of the Habitats Directive, Stage 2 AA of the RWRP-NW is required.	Impacts on the marine environment have been part of the assessment and consideration of transboundary impacts. The basis of the assessment, relevant options identified for assessment, aspects considered and the conclusions are presented in the SEA Environmental Report and transboundary impacts on European Sites are also considered in the Appropriate Assessment.
Consultation and engagement		
Environmental Protection Agency	EPA states that given the significance of the series of regional plans as key water services plans, the establishment of a signal environmental working group would provide oversight of the environmental monitoring and reporting for all of the regional plans A suggestion to consider the implementation stages of plans such as the Offshore Renewable Energy Development Plan (OREDP) and Food Wise 2025. Such a working group should be inherently linked to any such working groups associated with the National Water Resources Plan and the groups should work together in delivering the environmental monitoring required under the water resource plans.	In recognition of the importance of multi-stakeholder engagement and collaboration in managing shared natural resources, Irish Water have formed a group of EPA, GSI, NFGWS, DHLG and Independent experts to provide steering on the strategy, objectives and high-level activities needed to ensure the concepts of the three pillars are consolidated
Environmental Protection Agency	Under the SEA Regulations, Irish Water should consult with: • Environmental Protection Agency; • Minister for Housing, Local Government and Heritage; • Minister for Environment, Climate and Communications; • Minister for Agriculture, Food and the Marine.	Irish Water consulted with all of these Bodies for scoping and all are included in the consultation document and will be part of the engagement process for the RWRP and SEA.

Consultee	Submission comment	Response
Environmental Protection Agency	A suggestion that Irish Water give hosts an SEA scoping workshop with key stakeholders likely to be impacted by the Plan and the statutory SEA environmental authorities as part of the SEA scoping process.	Stakeholder workshops were held on the SEA scoping report for the Framework plan and on the development of the options appraisal methodology. The RWRP and SEA Environmental report apply the methodology and a full programme of engagement with key stakeholders on the proposals will be part of the public consultation.
Environmental Protection Agency	Consultees noted the need to fully identify any significant data and knowledge gaps and include commitments to help address these on a priority basis during the implementation phase of the Plan.	The SEA and RWRP identify priorities for improving monitoring and gathering better data. Limitations or data gaps and assumptions are identified. In terms of the adequacy of existing information the issue here is that it is not currently stored centrally, as it was historically collected and collated by Local Authorities. Irish Water is building a telemetry system which will aid bringing all this data together but this will take time. Data and knowledge gaps are identified in the limitations and assumptions section in both the SEA Report and the RWRP NW and commitments to improve data is included within the environmental action plan and as part of the RWRP NW monitoring and feedback process.
Northern Ireland Environment Agency	The Loughs Agency should be consulted in relation to this SEA Scoping exercise. As a statutory consultee The Department of Agriculture, Environment and Rural Affairs Northern Ireland (DAERA) Inland Fisheries will continue to provide comment on any proposals put forward as a result of this plan through the normal planning process.	Where any options are identified as having potential significant effects these would be identified and further consultation with DAERA and agencies such as the Loughs Agency would be undertaken if any such options are taken forward.
Department of Agriculture, Food and the Marine (Ireland)	A note that it is essential that any negative impacts on fisheries are avoided. The evaluation of potential impacts on any commercial sea fishing activities needs to be given consideration as part of any planning/proposal process and during the	Desalination options are the only options likely to have a significant negative impact on fisheries due to brine discharge therefore the potential impacts on fisheries will be considered

Consultee	Submission comment	Response
	development process itself. It is imperative that engagement should be sought with the fishing industry and other relevant stakeholders at as early a stage as possible to discuss any changes that may affect them to afford a chance for their input. Fishers' interests and livelihoods must be fully recognised, supported, and taken into account. We recommend including commercial fisheries as a material asset when assessing this plan.	as part of impact on biodiversity and socio-economic objectives. There is only 1 desalination option - this is a small scale island desalination plant within Study Area D. Potential impacts are identified for further assessment but with appropriate mitigation are not expected to be significant.
Legislation, Plans and Policies		
Environmental Protection Agency	A recommendation to review and update the list of legislation in the scoping report and add the transposing Irish legislations.	The list of legislation, Plans, Policies and Programmes for the PPP review within the SEA Report has been updated and the transposing Irish legislation has been added.
Environmental Protection Agency	The following additional legislation should be considered also: • Climate Action and Low Carbon (Amendment) Bill 2021 • The actions for the Climate Action Plan 2023.	The legislation and action plans have been added to the SEA Report in the PPP review and are included as key influences for the SEA and RWRP
Environmental Protection Agency	An observation that the Section on the Water Framework Directive does not consider water quality and focuses more on provision of water. This appears to be an oversight, as having better quality raw water means less costs and processes in water treatment and also results in greater treatment efficiency i.e. reduced volumes being abstracted. The environmental report should include water quality in the baseline data analysis.	The baseline analysis in the SEA Environment Report includes consideration of water quality including specific reference to pressures identified in SOER 2020. The benefits of improved raw water are recognized and potential to do more on catchment management initiatives and nature-based solutions is specifically raised as a recommendation to take forward.
Environmental Protection Agency	A recommendation that the environmental report should consider the status quo / baseline with regard to existing water service provision i.e. what the asset base is, including water mains, and level of treatment, in addition to the concerns of the RAL.	The SEA Report considers baseline with regards to existing water provision. The SEA Report includes reference to the existing water service provision including level of service and treatment deficiencies and RAL list with more detail provided in the Study Area Environmental Review appendices.

Consultee	Submission comment	Response
Environmental Protection Agency	A recommendation that the environmental report should include the benefits from an indication of domestic versus non-domestic volumes supplied, any inter region transfers (included out of this study area) and interactions with the group water scheme sector (as there are some that are operated as group water schemes on behalf of Irish Water and vice versa). While it may not be possible to convey detail on these in the SEA, they warrant discussion nonetheless as they will be factors in the overall regional plan review.	The Group water scheme (GWS) sector covers the private group water schemes Irish Water considers options for connecting to GWSs and taking over GWSs and also where there have deficits in WSZs that are fed from GWS owned sources and WTPs. This information is fed into the supply demand balance and option development.
Environmental Protection Agency	A recommendation to use the EPA OSI national land cover map, currently being developed by the EPA and partners, as addition to using Corine Land Dataset for further detailed habitats and land use information.	The EPA OSI national land cover map is not currently available, however it has been highlighted in the SEA Environmental Report review for use in future updating habitats and land use information once available.
Environmental Protection Agency	A recommendation that climate change risks identified by counties in the core baseline area should also include reference to water quality as a key risk area as climate change impacts from flooding and storm surges not only impact on land and water supply but also on the actual quality of the water itself, e.g. suspended solids, movement of contaminants, etc.	Whilst not specifically identified in county level plans, climate change induced risk of water contamination through changes such as increased sediment loads and release of nutrients from catchment soils and effects of flooding on water quality would be a consideration for the future and relevant particularly for catchment management approaches and wider land use management.
Environmental Protection Agency	In addition, the DHLGH are preparing Guidelines for the incorporation of the Water Framework Directive into the Planning System, which is also undergoing SEA currently. This should in particular be taken into account in finalising and implementing the Plan.	We will take the Guidelines into account once available and have added a note to the SEA ensure this.
Northern Ireland Department for Communities Historic Environment Division	Historic Environment Division (HED) advises, the following legislation and plans should also be included: • Historic Monuments and Archaeological Objects (Northern Ireland) Order 1995 • Protection of Wrecks Act 1973 • Archaeology 2030 - A Strategic Approach for Northern Ireland	The legislation and action plans have been added to the SEA Report in the PPP review and are included as key influences for the SEA and RWRP. We will include review of local development plans prepared by the District Councils in NI as relevant to any options identified as having

Consultee	Submission comment	Response
	• The Strategic Planning Policy Statement We would also note that District Councils in NI are currently in the process of taking forward their own local development plans and will have relevance in taking forward the RWRP-NW and any subsequent local plans or projects.	potential for impact on the environment in Northern Ireland.
Northern Ireland Environment Agency	NI baseline conditions and relevant plans and programmes will need to be considered as part of the Environmental Report.	Figure 5.4 illustrates the transboundary environment and addresses the water environment and designated sites within Northern Ireland. Transboundary policies and plans have been reviewed as listed in Appendix F and potential for transboundary effects associated with plan proposals have been considered through the assessment process and findings are included in the Environmental Report. Section 6 outlines the approach and section 9 considers potential for options to have effects on Northern Ireland. No transboundary effects have been identified through this process. The RWRP-NW, SEA Environmental Report and NIS will be provided to the relevant Northern Ireland agencies as part of the consultation process.
Northern Ireland Environment Agency	A note to include the following plans in the considerations: • The Wildlife (NI) Order 1985 (as amended) • Wildlife and Natural Environment Act (NI) 2011 • The Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 (as amended) • The Environment (NI) Order 2002 • The Planning (Environmental Impact Assessment) Regulations (Northern Ireland) 2017 • The Strategic Planning Policy Statement (SPPS) for Northern Ireland • Planning Policy Statements (PPS – in particular PPS2 and PPS18). It should be noted that the PPS's will be superseded by Local Development Plans when they are adopted	The legislation and action plans have been added to the SEA Report in the PPP review and are included as key considerations for the SEA and RWRP as relevant to the proposals put forward. Information sources have been reviewed and taken into consideration where necessary and relevant.

Consultee	Submission comment	Response
	• Biodiversity Strategy for NI to 2020 • Environment Strategy • The NI peatland policy • The Green Growth Strategy Consultation on the Green Growth Strategy for Northern Ireland • Northern Ireland Energy Strategy 2050 Northern Ireland Energy Strategy 2050 • Climate Change Act (Northern Ireland) 2022 • Climate Risk Independent Assessment 2021 • The Private Water Supplies Regulations (Northern Ireland) 2017 • Sustainable Water – A Long term water strategy for Northern Ireland (2015 –2040) • Strategic Planning Policy Statement • Regional Landscape Assessment • River Basin Management Plan for the 3rd cycle period which runs from 2021-2027 • Northern Ireland State of the Environment Reports • Northern Ireland Environmental Statistics Reports • Designated Scientific Sites: www.daera-ni.gov.uk/landing-pages/protected-areas Regional Landscape Character Map viewer: https://www.daerani.gov.uk/services/regional-landscape-character-areas-map-viewer DAERA have a map browser for NI protected sites and known priority habitat: www.daera-ni.gov.uk/services/natural-environment-map-viewer Our natural environment datasets are available at the link below: www.daera-ni.gov.uk/articles/download-digital-datasets Appropriate Assessments should refer to the status of habitats and species in the relevant reports available on the JNCC website as follows: UK Article 17 report for the Habitats Directive https://jncc.gov.uk/our-work/article-17-habitats-directive-report-2019/ and the UK Article 12 report for the Birds Directive https://jncc.gov.uk/ourwork/european-reporting/#birds-directive-reporting Historic Environment Division Digital Datasets https://www.communities-	

Consultee	Submission comment	Response
	ni.gov.uk/publications/historic-environment-digital-datasets	
Northern Ireland Environment Agency	Reference to individual border area councils Local Development Plans could be considered in relation to Landscape designations.	Where there are any new proposals for new construction works or schemes that are in close proximity to the border and thus may have an impact, we will include consideration of local landscape designations.
Northern Ireland Environment Agency	Marine and Fisheries Division (M&FD) recommends, where plans are in close proximity and hydrologically linked to Lough Foyle and Carlingford Lough the following plans, policies and programmes are also considered: • Wildlife (Northern Ireland) Order 1985 • Conservation (Natural Habitats, etc.) Regulations (Northern Ireland) 1995 • The Marine and Coastal Access Act 2009 • Strategic Planning Policy Statement for Northern Ireland 2015 • An Integrated Coastal Zone Management Strategy for Northern Ireland 2006-2026 • Northern Ireland Regional Seascape Character Assessment 2014	The plans, policies and programmes have been added to the SEA Report in the PPP review and are included as key influences for the SEA and RWRP.
Northern Ireland Environment Agency	The Marine Plan Team Advice (MPT) suggests that the NI Marine Plan (2018) be included in 4.6 'In-combination Effects' as a plan that is on a similarly strategic level and that has a clear potential to have an in-combination effect upon European Sites. The inclusion of the Marine Plan NI within the ongoing RWRP-NW AA process will enable full consideration of all possible marine related likely significant effects (LSEs).	We will consider effects on the marine environment as part of the in-combination/ cumulative effects chapter in the SEA and NIS.
Northern Ireland Environment Agency	In relation to transboundary catchments Inland fisheries would recommend that any subsequent SEA/AA be cognisant of both, North Atlantic Salmon Conservation Organisation (NASCO), Convention for the Conservation of Salmon in the North Atlantic Implementation Plan for the period 2019 – 2024, this an international commitment for Northern Ireland (as part of the UK; ROI through the EU is also a signatory) and should be included as this policy has	The plans, policies and programmes have been added to the SEA Report in the PPP review and are included as key influences for the SEA and RWRP and will also be taken forward for consideration in more detailed studies as relevant.

Consultee	Submission comment	Response
	the potential to impact this species and the goals of this plan; and also the Fisheries Act (NI) 1966 (as amended).	
Drinking water quality		
Environmental Protection Agency Geological Survey Ireland	A recommendation to consider the changes incorporated in the recast Drinking Water Directive. Furthermore, greater emphasis could be placed on the Drinking Water Directive in relation to the environmental report and it should be considered as a key influence in addition to those plans and programmes already listed.	Irish Water considered changes included in the recast Drinking Water Directive and SEA Report now includes updated references. Drinking Water Directive is added to key national level influences listed in chapter 4.
Environmental Protection Agency	A recommendation that the baseline should include greater discussion of issues surrounding contaminants of existing and emerging concern which pose a threat to drinking water and to public health. For example, pesticides (of which there have been a number of exceedances in drinking water supplies in recent years), trihalomethane (THM) contamination, pharmaceuticals (including but not limited to antimicrobials (relevance to Ireland's National Action Plan on Antimicrobial Resistance (iNAP) as well as the forthcoming successor iNAP2)), microplastics, pathogenic and antimicrobial resistant bacteria and parasites (STEC/VTEC, Cryptosporidium, Giardia, etc.). The environmental report should give greater recognition of these challenges, how they may impact supplies and how they may be managed into the future taking account of projected population growth, urbanisation, agricultural activity and climate change.	Section 5.4.1 in the baseline includes consideration of the current and emerging concerns for water quality The source risk assessments currently in development align with the DWD Recast and will offer a leading/ potential indicator of risk of contamination rather than 'lagging'/ at the customers tap. This will be approached using the source-pathway-receptor concept and considering sources of contaminants in the catchment. These risk assessments will span existing contaminants in the short term, e.g. pesticides, Cryptosporidium, E. coli and natural organic matter, with a view to expanding of contaminants of emerging concern (microplastics, pathogenic and antimicrobial resistant bacteria, 'forever chemicals'.
Biodiversity, Flora and Fauna		
Northern Ireland Environment Agency	A recommendation to consider the following issues including the potential disturbance to/impact on NI/RoI migratory/mobile species such as salmon, for example within the Lough Melvin Special Area of Conservation which lies within both Northern Ireland and the Republic of Ireland. Cross border designated sites, European sites in Northern Ireland adjacent to or with pathways to/from the Republic of Ireland, priority habitats, river basins, and other landscape	These direct and indirect issues/impacts on cross-border designated sites, and priority habitats and species are considered in the SEA and NIS.

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	types also require special attention as ecological functionality and 'views' of landscape cross political boundaries. The SEA should consider all potential impacts including those which may impact Northern Ireland both directly and indirectly. Consideration should be given to priority habitats and species in NI that may be impacted.	
Northern Ireland Environment Agency	Note that following the decision of the United Kingdom to leave the European Union, the collective term of "Natura 2000" sites the network of European protected sites are now known as "National Site Network" sites within the United Kingdom, and is including Northern Ireland.	This has been considered and we will use National Site Network instead of Natura 2000 when referring to sites within Northern Ireland.
Northern Ireland Environment Agency	A recommendation that the SEA should consider all potential transboundary issues in relation to the aquatic environment. Cross border river basins require special attention as ecological functionality cross jurisdictional boundaries. The SEA should consider all potential impacts including those which may impact Northern Ireland both directly and indirectly.	As mentioned above, these direct and indirect issues/impacts on cross-border designated sites, and priority habitats and species are all be considered in the SEA Environmental Report and NIS.
Northern Ireland Environment Agency	M&FD would like to have the opportunity to comment on Desalination, in the future, if deemed a suitable option and if it was to occur near Lough Foyle and Carlingford Lough.	No desalinisation options are located in proximity to either Lough Foyle nor Carlingford Lough and no other options are identified with potential impacts anticipated on these receptors
Northern Ireland Environment Agency	M&FD lists several Northern Ireland MPAs which are associated with Lough Foyle and Carlingford Lough and recommend that they should be considered.	There are no options that affect Lough Foyle and Carlingford Lough
Northern Ireland Environment Agency	M&FD recommends considering the marine priority species listed on the Northern Ireland Priority Species List.	The marine priority species listed on the Northern Ireland Priority Species List will be considered
Northern Ireland Environment Agency	In relation to transboundary regions Inland Fisheries would recommend that any consideration of potential impacts should be in relation to all priority species and priority habitats as listed NIEA. Issues should include all loss of priority habitats and species.	The priority species and habitats as listed by NIEA will be considered in relation to potential impacts to the transboundary region.
Northern Ireland	A note that the issues which are likely to have a negative effect on Inland Fisheries interests would relate to Surface/Ground water abstractions and the	SEA options assessment assumes the implementation of standard mitigation measures, such as operation of water

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Environment Agency	introduction of reservoirs within transboundary catchments. These have the potential to affect fisheries habitats and species through habitat fragmentation, loss of habitats and deterioration/dewatering of habitats.	sources in line with regulatory requirements and the use of good construction practice in order to minimise negative effects.
Northern Ireland Environment Agency	M&FD recommends considering Nature based solutions (NbS) with regards to mitigation. NbS are defined by the IUCN as 'actions to protect, sustainably manage and restore natural or modified ecosystems that address social challenges effectively and adaptively, simultaneously providing human well-being and biodiversity benefits	Irish Water recognises the increasing importance of nature-based solutions and catchment measures in relation to improving water quality and reducing risk across our supplies. Irish Water is an active participant in catchment-based initiatives and where possible will incorporate NBS solutions at project level. These aspects are also incorporated in the SEA EAP and Monitoring Plan.
Cultural heritage		
Northern Ireland Department for Communities Historic Environment Division	Historic Environment Division (HED) notes that a large number of heritage assets predate the border itself. Transboundary environment paragraph should include consideration of the potential for impacts on cultural heritage, particularly in regard to transboundary effects on marine heritage and industrial heritage assets within a riverine context, such as bridges, mill buildings and mill races. Agreements with landowners and farmers to improve water catchment management, should also take into account the potential for transboundary effects on known and unknown archaeology. Note: HED consider that there may be an inadvertent error in the report, in that Page 17 states "that "No Potential for transboundary effects has been identified", although this is contradicted in section 3.1.2 which states that "there is potential for transboundary effects".	All of the impacts to heritage assets will be considered where relevant, especially within the transboundary environment. The scoping report concluded that there is a potential for transboundary effects (as stated in section 3.1.2) and the statement on Page 17 was an error. The effects on the transboundary environment will be considered as part of the SEA of the NW.
Northern Ireland Department for Communities Historic Environment Division	HED on behalf of Department for Communities, maintain a record of designated and non-designated heritage assets, which should be used in this process of information gathering to understand where there is a likelihood or potential for transboundary impacts on cultural heritage, the associated constraints, and potential mitigation measures. Our datasets are	The Historic Environment Digital Datasets along with the marine historic environment datasets will be considered when assessing the transboundary effects on heritage assets.

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	available to download at Historic Environment Digital Datasets | Department for Communities (communities-ni.gov.uk) We also attach a link to our historic environment map viewer Historic Environment Map Viewer | Department for Communities (communities-ni.gov.uk). We further advise that additional datasets for Northern Ireland's marine historic environment may be obtained through contacting colin.dunlop@daera-ni.gov.uk	
Northern Ireland Department for Communities Historic Environment Division	HED suggests that the SEA objective for cultural heritage as set out in Table 4.2, is amended as follows, to align with regional guidance as set out in RG11 of the Regional Development Strategy and take account of the potential for indirect effects on cultural heritage. Protect, conserve and, where possible, enhance cultural heritage resources effected by provision of water services. We also consider that the issues and opportunities as set out in Table 4.1 should also include the potential for effects on architectural heritage.	Where this is potential for transboundary impacts, we will consider regional guidance. The potential impacts on architectural heritage will also be added and considered within the SEA report.
Landscape and visual amenity		
Northern Ireland Environment Agency	A note that transboundary concerns are particularly relevant to large water resource projects such as reservoirs, which could be located on or close to the border, and would potentially have a significant effect on landscape and visual amenity. Northern Ireland has designated Areas of Outstanding Natural Beauty (AONB), these areas are designated for the significant landscape quality. The Ring of Gullion AONB is located on the border and any proposals located in close proximity is likely to have a transboundary effect on this designation.	Landscape designations and major cultural heritage sites have been noted and considered. Additionally, there are no proposals within 20km of the Ring of Gullion AONB thus there is unlikely to be a transboundary effect on this designation.
Northern Ireland Environment Agency	Consideration of potential transboundary impacts on Landscape and Visual Amenity should be made more explicit in paragraph 3.11.4.	All transboundary impacts, including those regarding landscape and visual will be considered with chapter 5.12, with sources of information noted in Table 3.14.

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Northern Ireland Environment Agency	Regarding the key environmental topics included, M&FD recommends the water environment also includes any hydrologically linked marine environments and that the landscape topic also includes consideration of seascape. M&FD recommends the inclusion of marine habitats such as saltmarshes and estuarine habitats.	Marine and coastal environments are included in the assessment and seascape is taken into account (see baseline section 5)