Colligan Mahon Catchment Assessment 2010-2015 (HA 17)

Catchment Science & Management Unit

Environmental Protection Agency

December 2018

Version no. 3

epaCatchments
Healthy • Resilient • Productive
Valued water resources supporting vibrant communities

Preface

This document provides a summary of the characterisation outcomes for the water resources of the Colligan Mahon Catchment, which have been compiled and assessed by the EPA, with the assistance of local authorities and RPS consultants. The information presented includes status and risk categories of all water bodies, details on protected areas, significant issues, significant pressures, load reduction assessments, recommendations on future investigative assessments, areas for actions and environmental objectives. The characterisation assessments are based on information available to the end of 2015. Additional, more detailed characterisation information is available to public bodies on the EPA WFD Application via the EDEN portal, and more widely on the catchments.ie website. The purpose of this document is to provide an overview of the situation in the catchment and help inform further action and analysis of appropriate measures and management strategies.

This document is supported by, and can be read in conjunction with, a series of other documents which provide explanations of the elements it contains:

1. An explanatory document setting out the full characterisation process, including water body, subcatchment and catchment characterisation.
2. The Final River Basin Management Plan, which can be accessed on: www.catchments.ie.
3. A published paper on Source Load Apportionment Modelling, which can be accessed at: http://www.jstor.org/stable/10.3318/bioe.2016.22
4. A published paper on the role of pathways in transferring nutrients to streams and the relevance to water quality management strategies, which can be accessed at: http://www.jstor.org/stable/pdf/10.3318/bioe.2016.19.pdf
5. An article on Investigative Assessments which can be accessed at: https://www.catchments.ie/download/catchments-newsletter-sharing-science-stories-june-2016/

Table of contents

1 Introduction 1

2 Water body status and risk of not meeting environmental objectives 2

2.1 Surface water ecological status 2

2.1.1 Rivers and lakes 2
2.1.2 Transitional and Coastal (TraC) 3

2.2 Groundwater status 6

2.3 Risk of not meeting surface water environmental objectives 7

2.3.1 Rivers and lakes 7
2.3.2 Transitional and Coastal (TraC) 7

2.4 Risk of not meeting groundwater environmental objectives 8

2.5 Protected areas 9

2.5.1 Drinking water protected areas 9
2.5.2 Bathing waters 9
2.5.3 Shellfish areas 9
2.5.4 Nutrient sensitive areas 9
2.5.5 Natura 2000 sites 9

2.6 Heavily modified water bodies 11

3 Significant issues in At Risk water bodies 11

4 Significant pressures 11

4.1 Water bodies 11

4.1.1 Rivers, lakes, transitional and coastal (TraC) 11
4.1.2 Groundwater 12

4.2 Pressure type 12

4.2.1 Agriculture 12
4.2.2 Urban waste water treatment plants 12
4.2.3 Domestic waste water 13
4.2.4 Other significant pressures 13
4.2.5 Forestry 13

5 Load reduction assessment 16

5.1 River water body load reductions 16

5.2 TraC load reductions 17

6 Further characterisation and local catchment assessments 18

7 Catchment summary 18

8 Areas for Action 19

8.1 Process of Selection 19

8.2 Outcomes of process 19

9 Environmental Objectives 20
9.1 Surface Water 21
9.2 Groundwater 21
10 Acknowledgements 24

1 Introduction

This catchment includes the area drained by the Rivers Colligan and Mahon and all streams entering tidal water between Cheekpoint and East Point, Co. Waterford, draining a total area of 665 km². The largest urban centre in the catchment is Tramore. The other main urban centres are Dungarvan and Dunmore East. The total population of the catchment is approximately 41,320, with a population density of 62 people per km².

This is a coastal catchment, dominated by the sandstone uplands of the Monavullagh and Comeragh Mountains. The southwestern region of the catchment to the south of Helvick Head is drained by a series of small southerly flowing rivers including the Knockmeelmore, Ballylangadon, Addrigole, Screathan and Maol and Choirnigh Rivers. The flat, karstified limestone-floored valley, to the west of Dungarvan is drained by the Brickey River which flows into Dungarvan Harbour behind Cunnigar. There are rich deposits of copper around the coast in this catchment and copper mining was historically important in this area. An arterial drainage scheme was completed on the Brickey River by the OPW between 1965 and 1967. The Colligan River drains the western flanks of the Monavullagh Mountains, flowing south, through Dungarvan and into Dungarvan Harbour from where it reaches the sea between Ballynacourty Point and Helvick Head.

The Dalligan River drains the southern tip of the Monavullagh Mountains, flowing south to the sea west of Ballyvoyle Head. The eastern flanks of the Monavullagh Mountains are drained by the River Tay which flows southeast and into the sea near Stradbally. The River Mahon rises close to the Summit plateau of the Commeragh Mountains, flowing south and over Mahon Falls, before turning east and then south at Kilmacthomas and finally flowing out to sea at Bunmahon. The eastern part of the catchment is drained by a series of north-south flowing rivers including the Kilmurrin, Ballynagorkagh, Monloum and Corbally Rivers, the last two of which reach the sea through Tramore Bay.

The Colligan Mahon catchment comprises six subcatchments (Table 1, Figure 1) with 35 river water bodies, two lakes, six transitional and six coastal water bodies, and ten groundwater bodies.

Table 1. List of subcatchments in the Colligan Mahon catchment

Subcatchment ID	Subcatchment Name
17_1	Kilmurrin_SC_010
17_2	MONLOUM_SC_010
17_3	Mahon_SC_010
17_4	Tay_SC_010
17_5	Maoil_an_Choirnigh_SC_010
17_6	Colligan_SC_010

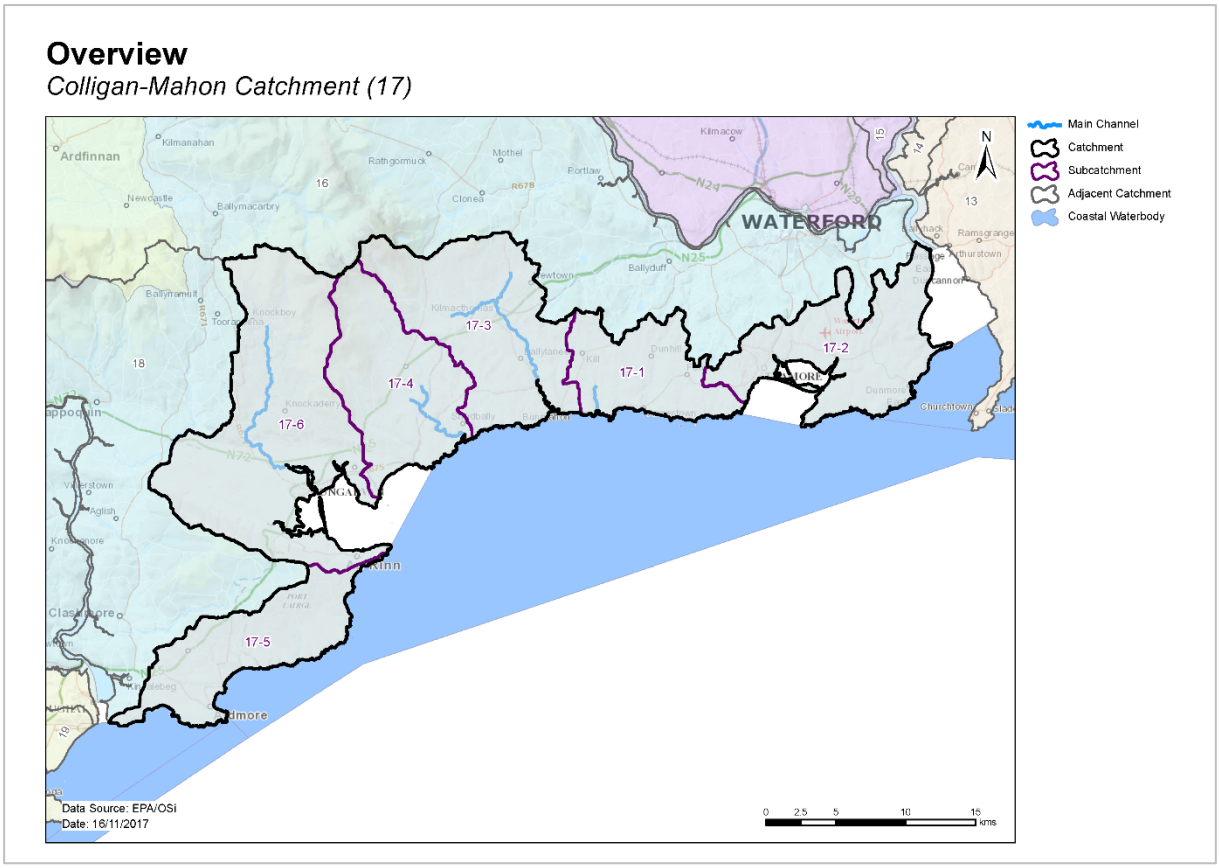


Figure 1. Subcatchments in the Colligan Mahon catchment

2 Water body status and risk of not meeting environmental objectives

2.1 Surface water ecological status

2.1.1 Rivers and lakes

- There were ten (27%) river and lake water bodies at Good or High status, and six (16%) at less than Good status in 2015 (Table 2, Figure 2). Twenty-one (57%) river and lake water bodies are unassigned.
- Four river water bodies and sites have a high ecological status objective. In 2015, three (75%) of these water bodies were at High status, and one was at Good (Figure 3, Appendix 1).
- The numbers of water bodies at each status class in 2007-09 and 2010-15 are shown in Figure 4 (rivers). The Belle lake water body has remained at Moderate status throughout the cycles.
- Since 2007-09 when WFD monitoring began, one water body has an improved status whereas four have deteriorated (Figure 7).
- The variation in nutrient concentrations and loads in the Colligan and Mahon main channel is illustrated in Appendix 2.

2.1.2 Transitional and Coastal (TraC)

- There are 12 TraC water bodies in the Colligan Mahon catchment, five of which are transitional water bodies and seven are coastal. One transitional and two Coastal water bodies (Lower Blackwater M Estuary / Youghal Harbour, Youghal Bay and Western Celtic Sea (HAs 18;19;20)) are also shared with the Blackwater catchment.
- Five of the water bodies are at Good or High status (Dungarvan Harbour, Tramore Back Strand, Waterford Harbour, Barrow Suir Nore Estuary and Youghal Bay) and two (Lower Blackwater M Estuary/Youghal Bay and Colligan Estuary) are at less than Good status in 2015 (Table 2, Figure 5). Five water bodies are unassigned.
- Tramore Back Strand has a high ecological status objective. In 2015, it was at High status (Figure 3, Appendix 1).
- The numbers of water bodies at each status class in 2007-09 and 2010-15 are shown in Figure 5 (TraCs).
- Note several of the TraC water bodies are shared with other catchments, HAs 13,19 and 20.

Table 2. Summary of surface water body status and risk categories

	Number of water bodies	2010-15 Status						Risk Categories		
		High	Good	Mod	Poor	Bad	Unassigned	*Not at Risk*	*Review*	*At Risk*
Rivers	35	3	7	1	4	0	20	10	18	7
Lakes	2	0	0	1	0	0	1	0	1	1
TraCs	12	2	3	2	0	0	5	5	4	3

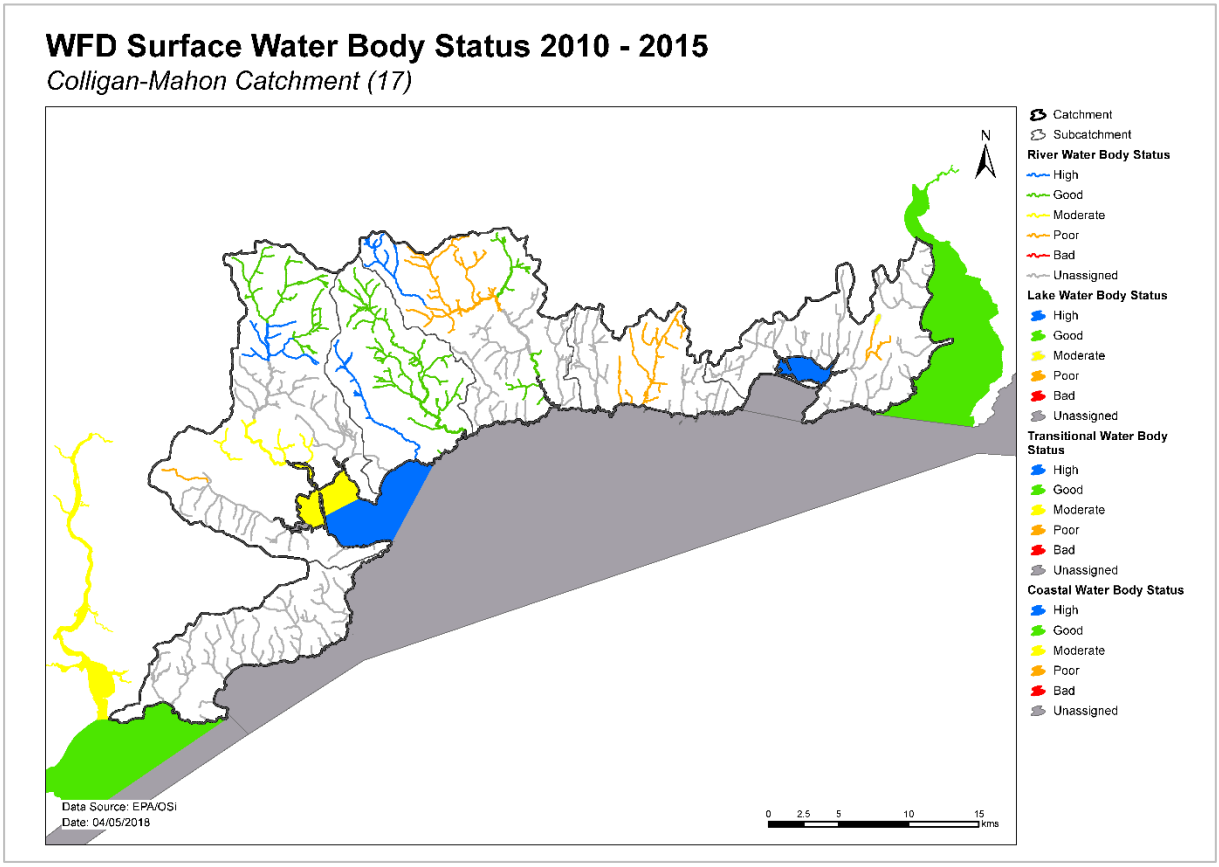


Figure 2. Surface water ecological status

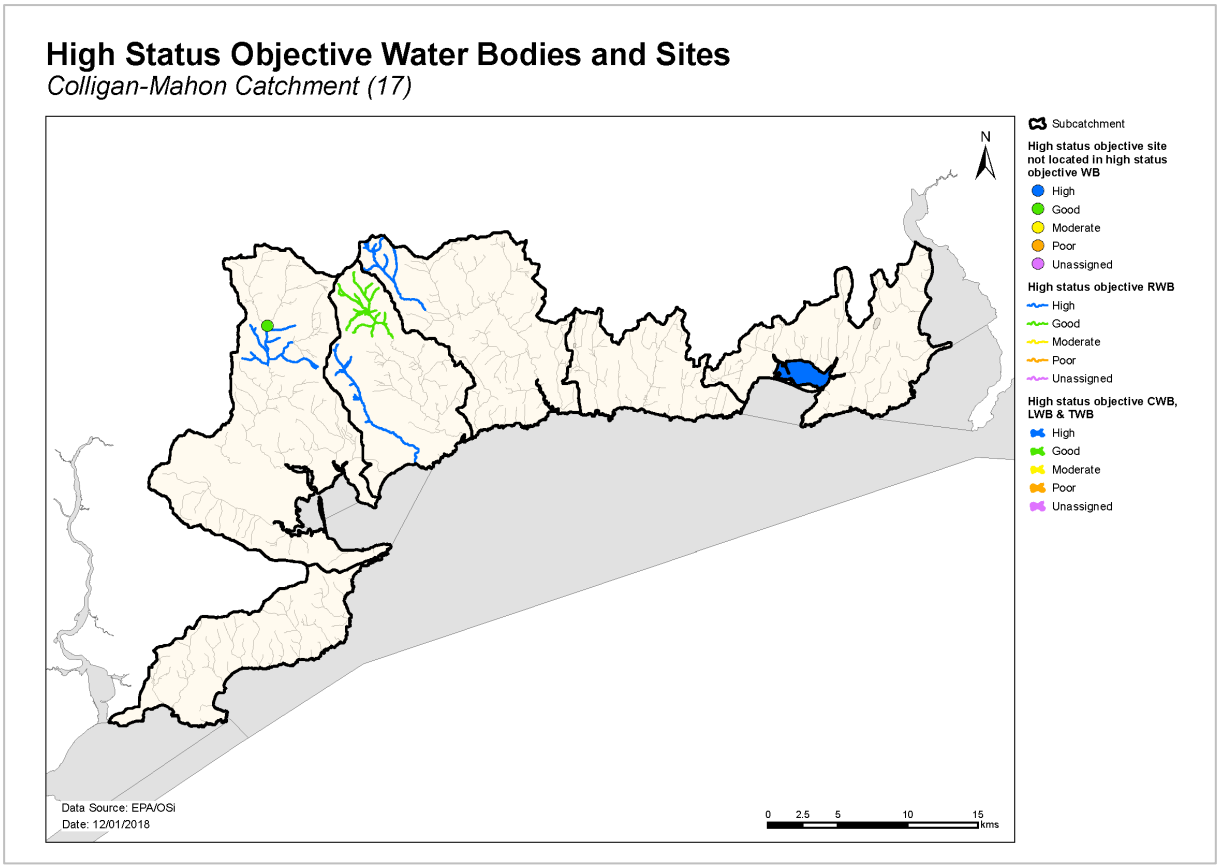


Figure 3. High ecological status objective water bodies and sites

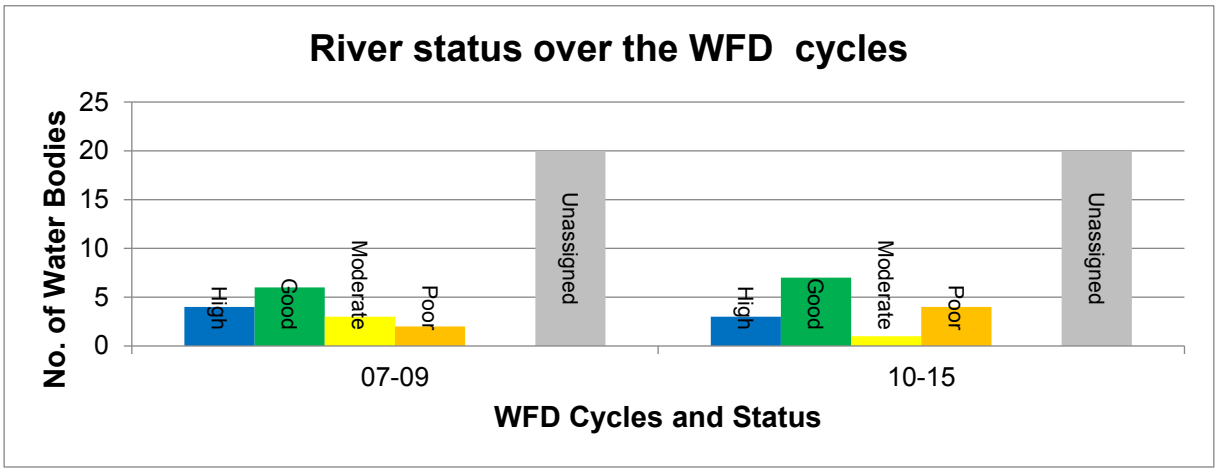


Figure 4. Number of rivers at each status class in 2007-09 and 2010-15

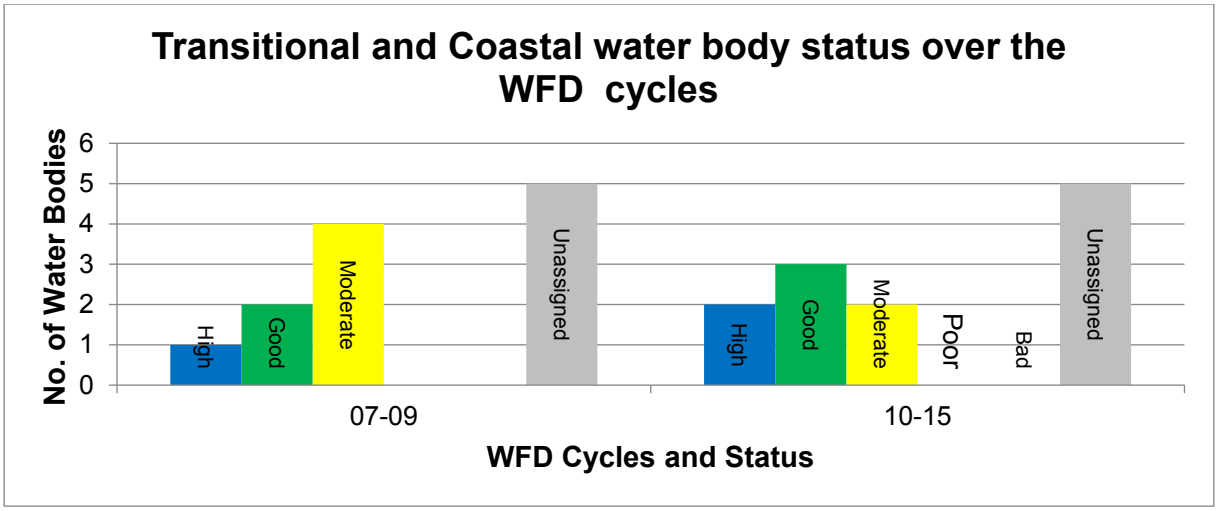


Figure 5. Number of TraCs at each status class in 2007-09 and 2010-15

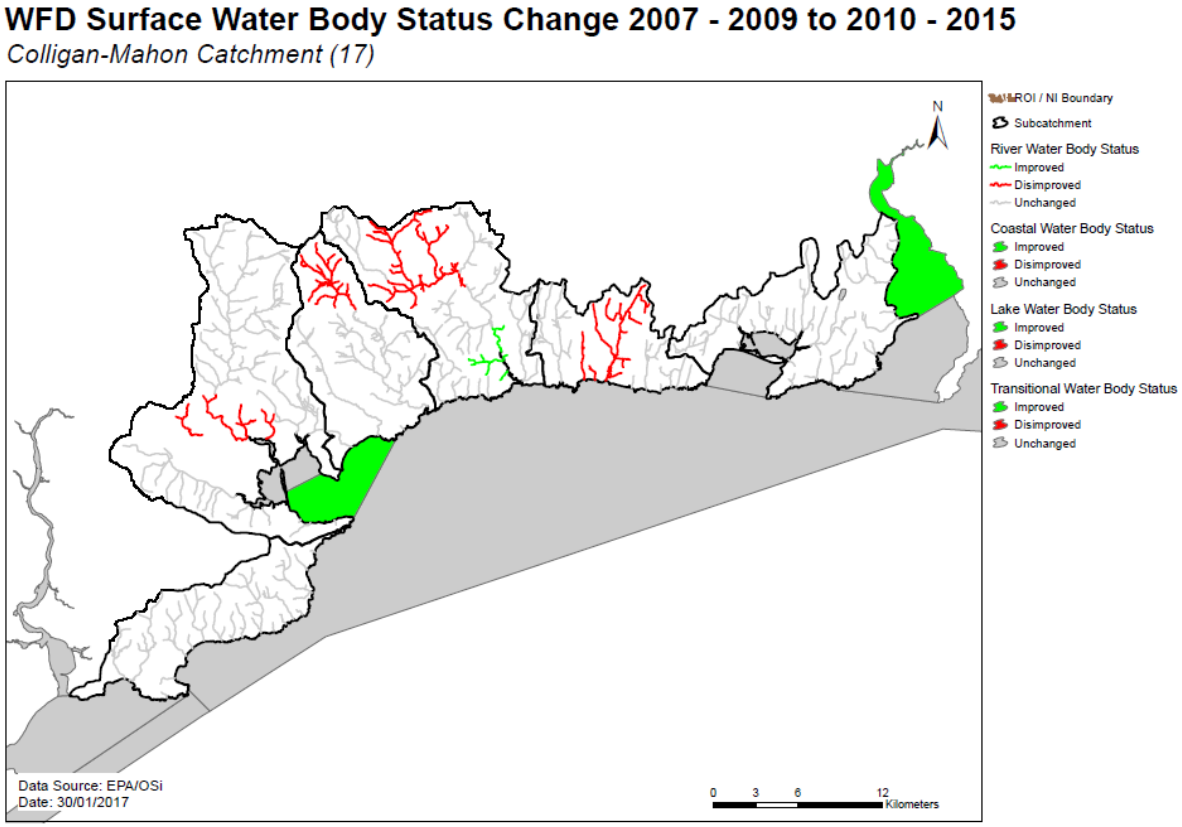


Figure 7. Surface water body status change from 2007-09 to 2010-15

2.2 Groundwater status

- There were nine groundwater bodies at Good status and one at Poor status in 2015 (Table 3, Figure 8). IE_SE_G_178 - Waste Facility (W0032-02) was classified at Poor status due to improved information being available and the development of technical assessment approaches, rather than there being deterioration in water quality in this water body between 2007-12 and 2010-15

- In 2007-12, all ten groundwater bodies were classed at Good status (Figure 6).

Table 3. Summary of groundwater body status and risk categories

	Number of water bodies	2010-15 Status		Risk Categories		
		Good	Poor	*Not at Risk*	*Review*	*At Risk*
Groundwater	10	9	1	3	5	2

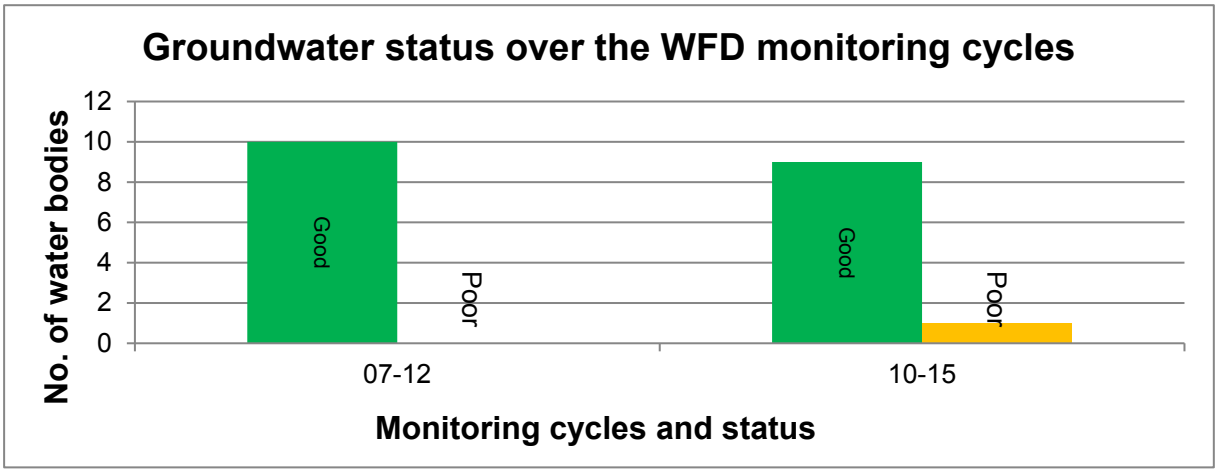


Figure 6. Number of groundwater bodies at each status class in 2007-12 and 2010-15

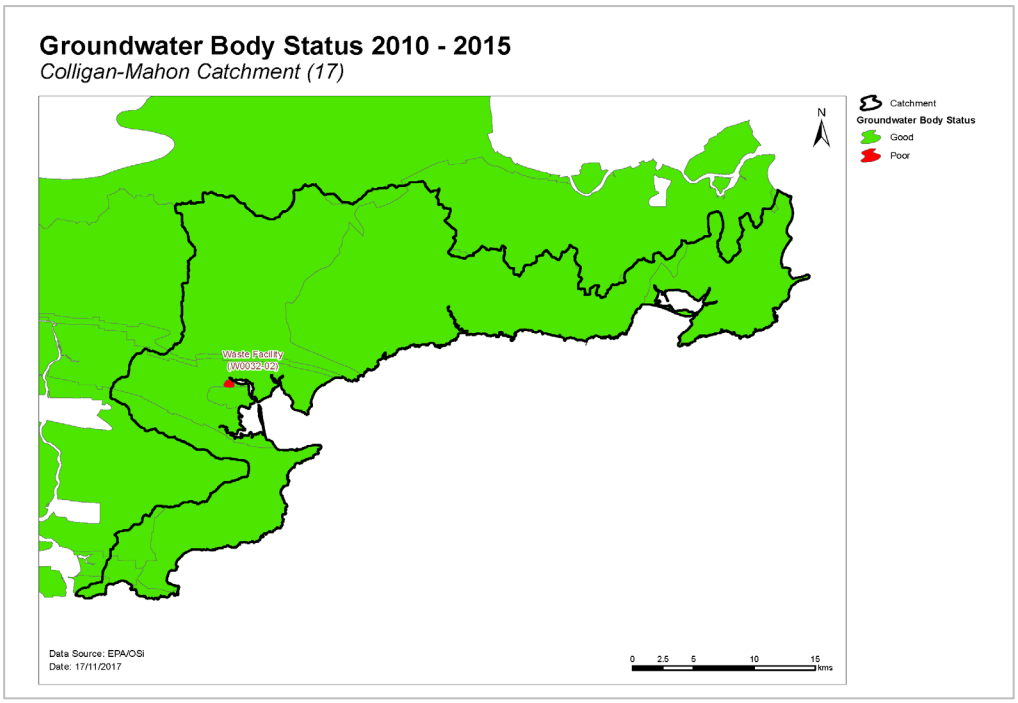


Figure 8. - Groundwater body status 2010-2015

2.3 Risk of not meeting surface water environmental objectives

2.3.1 Rivers and lakes

- There are ten *Not at Risk* river and lake water bodies (Figure 9, Table 2) and these require no additional investigative assessment or measures to be applied, other than those measures that are already in place.
- There are 19 river and lake water bodies in *Review* for which more information is required.
- Eight surface water bodies in the catchment are *At Risk* of not meeting their water quality objectives. Measures will be needed in these water bodies to improve the water quality outcomes. Summary information for the *At Risk* water bodies is given in Appendix 3.

2.3.2 Transitional and Coastal (TraC)

- There are five TraC water bodies (Dungarvan Harbour, Tramore Bay, Eastern Celtic Sea (HAs 13;17), Tramore Bay, Western Celtic Sea (HAs 18;19;20) Barrow Suir (HA16) and Barrow Suir Nore Estuary) which are *Not at Risk* (Figure 9) and therefore require no additional investigative assessments or measures to be applied, other than those measures that are already in place.
- Four TraC water bodies (Waterford Harbour, Tramore Back Strand, Brickey Estuary and Mahon Estuary) are in *Review*.
- The remaining three TraC water body in the catchment (Colligan Estuary, Lower Blackwater M Estuary / Youghal Harbour and Youghal Bay) are *At Risk* of not meeting their water quality objectives. Measures will be needed in these water bodies to improve the water quality outcomes.

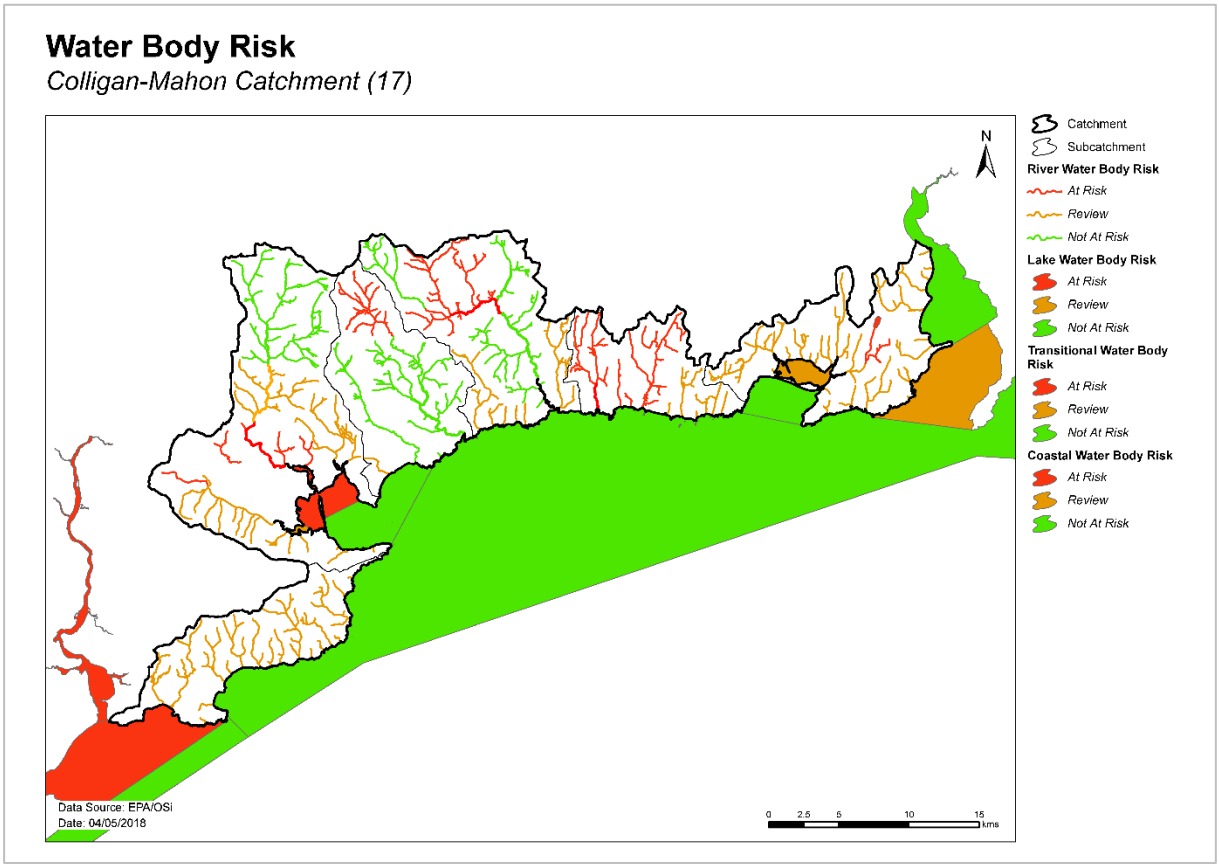


Figure 9. Surface water body risk

2.4 Risk of not meeting groundwater environmental objectives

- Three groundwater bodies are *Not at Risk* (Figure 10, Table 3) and require no additional investigative assessment or measures to be applied, other than those measures that are already in place.
- Five groundwater bodies are in *Review.* Ballyknock is hydrologically linked to surface waters that are not meeting water quality objectives where it is considered likely that groundwater is a contributing source of nutrients (Figure 10, Table 5). All five groundwater bodies (Ballyknock, Dungarvan, Helvick Head, Glenville and Tourig Group 3) have elevated nitrate concentrations.
- There are two *At Risk* groundwater bodies. Tramore is hydrologically linked to surface waters that are not meeting water quality objectives where it is considered likely that groundwater is a contributing source of nutrients (Table 5). Waste Facility (W0032-02) IE_SE_G_178 has ammonia issues. Measures will be needed in both water bodies to improve water quality outcomes.

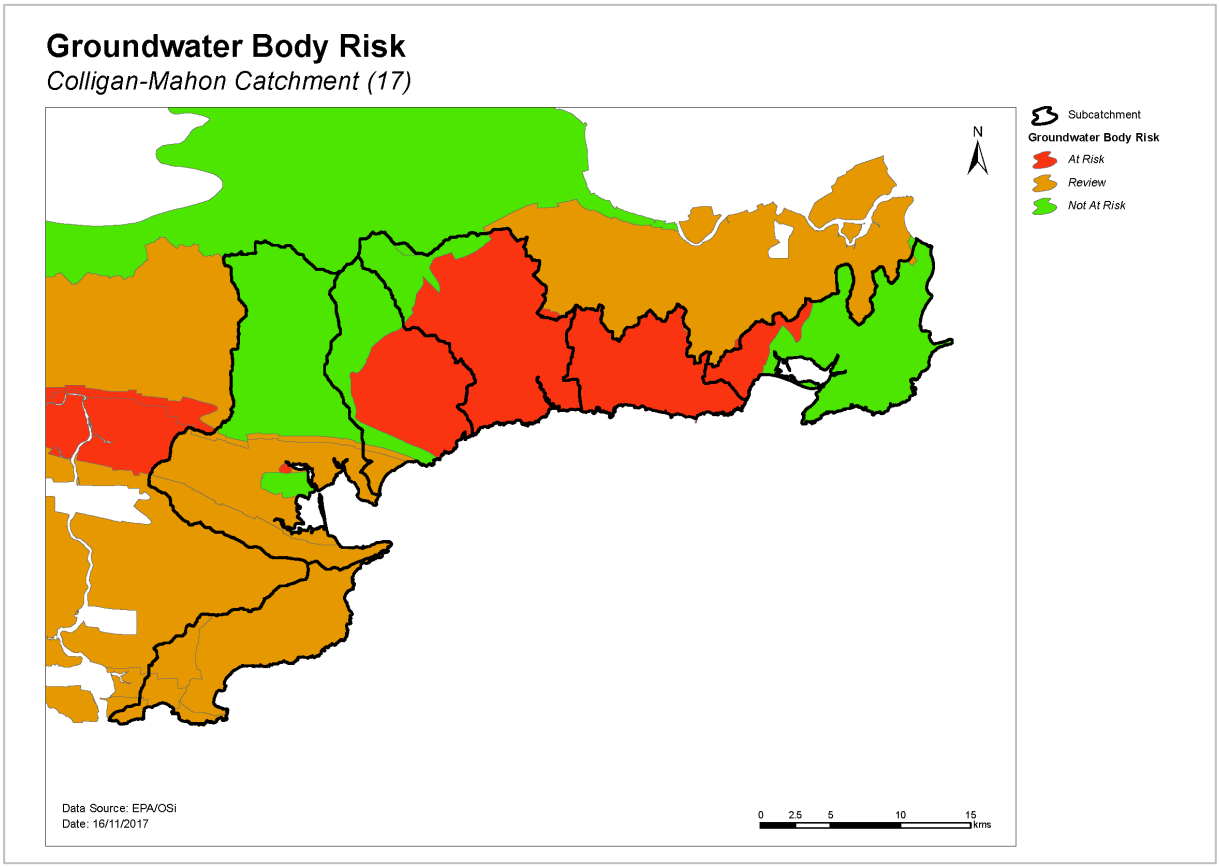


Figure 10. Groundwater body risk

Table 4. Summary of *At Risk* surface water bodies where phosphate from groundwater may contribute to an impact.

Groundwater body name	Receiving water body code	Receiving water body name
Tramore	IE_SE_17D020300	DUNHILL_010

2.5 Protected areas

2.5.1 Drinking water protected areas

- There are 52 abstractions in the Colligan Catchment, comprising one group water scheme, 37 public supply schemes and nine private supply schemes.
- Forty-seven of the abstractions are from six groundwater bodies (Dungarvan, Glenville, Helvick Head, Kilrion, and Tramore); and five are from five river water bodies (Mahon_040, Mahon_030, Ballyvaden str_010, Tay_030 and Maoil_an_Choirnigh_010). The list of the public supplies and the associated water bodies is provided in Appendix 4.
- There was one drinking water source that was non-compliant with the standards for nitrate in 2015 – Tramore groundwater body. All other sources were compliant.
- All drinking water sources were compliant with the standards for pesticides in 2015.

2.5.2 Bathing waters

- There are six designated bathing waters in the catchment.
- Four of the bathing waters are in satisfactory condition.
- The remaining two (Ardmore Beach and Bunmahon Beach) failed to meet their environmental objectives, due to bacteriological water quality.
- The list of the bathing waters and the associated water bodies is provided in Table 5.

2.5.3 Shellfish areas

- There are two designated shellfish areas in the catchment (Dungarvan Harbour and Waterford Harbour (Cheekpoint/ Arthurstown/ Creadan).
- They are compliant with the relevant standards and there are no water quality issues of concern.
- Details on the shellfish areas and their associated water bodies are summarised in Table 6.

2.5.4 Nutrient sensitive areas

- There are no nutrient sensitive areas in the catchment.

2.5.5 Natura 2000 sites

- There are six Special Areas of Conservation (SACs) in the catchment (Appendix 5). However, these SACs do not have water quality and/or quantity conservation objectives for their qualifying interests.
- There are four Special Protected Areas (SPAs) in the catchment:
    - Dungarvan Harbour SPA (004032)
    - Helvick Head to Ballyquin SPA (004192)
    - Mid-Waterford Coast SPA (004193)
    - Tramore Back Strand SPA (004027)

  As there are no specific water quality and quantity supporting conditions identified in the site-specific conservation objectives for these SPAs, the intersecting water bodies are not assigned priority action for WFD protected area purposes in the second cycle.

Table 5. Designated bathing waters in the catchment

Bathing Water	Water Body Intersection	Objective met?	Comment	Objective met?		Comment
Name	Code	Name	Code	Yes	No	
Ardmore Beach	IESEBWC050_0000_0100	Eastern Celtic Sea (HAs 13;17)	IE_SE_050_0000		✓	Sufficient quality for 2012-2015.Less than Good quality E.coli, 95th percentile: 900 and 90th percentile: 428. IE results are just failing Good quality, 95th percentile: 211 and 90th percentile: 105. Returned to Sufficient in 2015. Ardmore returned to 'Sufficient' in 2015 assessment. Several high results in 2014 were due to sewage effluent disinfection system failures. A new WWTP commissioned in Q1 2016 is likely to lead to status improvements or, as a minimum, classification as 'Changes'
Bunmahon Beach	IESEBWC050_0000_0200	Eastern Celtic Sea (HAs 13;17)	IE_SE_050_0000		✓	Sufficient quality for 2012-2015.Less than Good Quality E.coli, 95th percentile: 589 and 90th percentile: 316. Excellent quality IE results, 95th percentile: 97 and 90th percentile: 53. Comparable performance in 2016 should meet Good quality.
Counsellors' Strand, Dunmore East	IESEBWC100_0000_0100	Waterford Harbour	IE_SE_100_0000	✓		
Dunmore Strand, Dunmore East	IESEBWC100_0000_0200	Waterford Harbour	IE_SE_100_0000	✓		
Tramore Beach	IESEBWC110_0000_0100	Tramore Bay	IE_SE_110_0000	✓		
Clonea Beach	IESEBWC140_0000_0100	Dungarvan Harbour	IE_SE_140_0000	✓		

Table 6. Designated shellfish areas in the catchment

Shellfish area		Water body intersection		Objective met?	
Name	Code	Name	Code	Yes	No
Dungarvan Harbour	IEPA2_0045	Colligan Estuary	IE_SE_140_0100	✓	
		Dungarvan Harbour	IE_SE_140_0000	✓	
Waterford Harbour (Cheekpoint/Arthurstown /Creadan)	IEPA2_0056	Barrow Suir Nore Estuary	IE_SE_100_0100	✓	
		Waterford Harbour	IE_SE_100_0000	✓	

2.6 Heavily modified water bodies

- There are no designated heavily modified water bodies (HMWB) in the catchment.
- There are no designated artificial water bodies (AWB) in the catchment.

3 Significant issues in *At Risk* water bodies

- Excess ammonia and phosphate leading to eutrophication are the dominant issues in rivers and lakes in Colligan Mahon Catchment. While pollution from organic matter is also a concern, this is only for a limited number of water bodies. Hydromorphological pressures were not identified for this catchment.
- Nitrates and excessive nutrients are the significant issue for TraC water bodies in the Colligan Mahon Catchment.
- Of the ten groundwater bodies, two are *At Risk*. Phosphates are an issue in one of the groundwater bodies, which is likely to be a contributing source of nutrients to surface water bodies that are not meeting water quality objective. Ammonia from the waste site Waste Facility (W0032-02) IE_SE_G_178 is also an issue in a groundwater body.

4 Significant pressures

4.1 Water bodies

- Where water bodies have been classed as *At Risk*, by water quality or survey data, significant pressures have been identified.
- Figure 11 shows a breakdown of the number of *At Risk* water bodies in each significant pressure category.

4.1.1 Rivers, lakes, transitional and coastal (TraC)

- Significant pressures have been identified through the initial characterisation process, in 11 surface water bodies, two of which have multiple pressures. The significant pressures will be refined as further characterisation is are carried out.
- The significant pressure affecting the greatest number of river and lake water bodies is agriculture, followed by urban waste water, domestic waste water, other, and forestry (Figure 11).
- The significant pressure affecting the greatest number of TraC water bodies is agriculture, followed by urban waste water (Figure 11).

4.1.2 Groundwater

- The significant pressure affecting the Waste Facility (W0032-02) IE_SE_G_178 groundwater body is the waste facility W0032-02. The key parameter of concern is ammonia. The significant pressure affecting Tramore groundwater body is domestic waste water, which is causing phosphate issues.

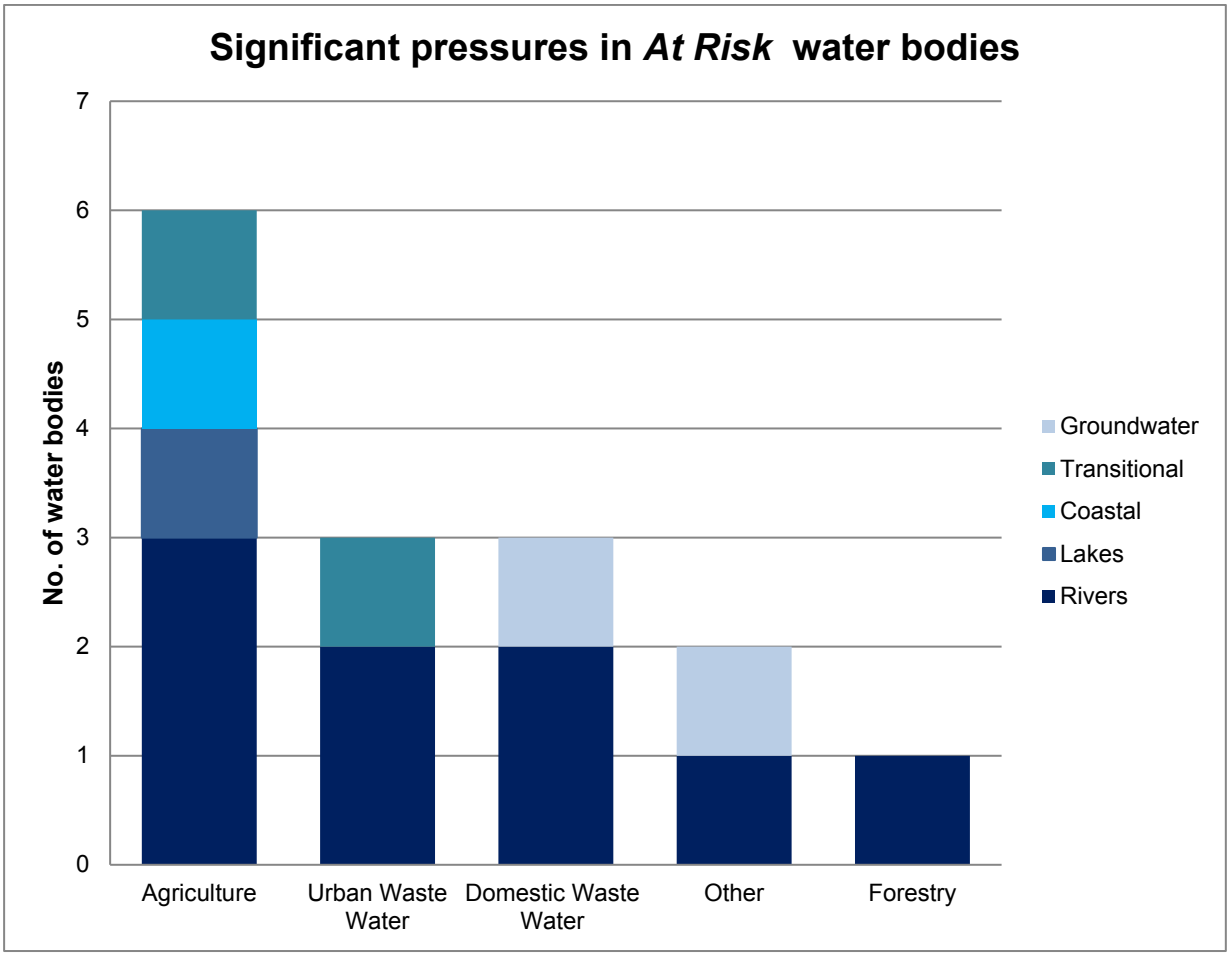


Figure 11. Significant pressures impacting on *At Risk* water bodies

4.2 Pressure type

4.2.1 Agriculture

- Agriculture is a significant pressure in one lake (Belle lake), three river water bodies (Leperstown Stream_010, Tay_010 and Brickey_010), one transitional water body (Lower Blackwater M Estuary / Youghal Harbour) and one coastal water body (Youghal Bay) (Figure 12). The issues related to farming in this catchment are phosphorus loss to surface waters from, for example, direct discharges; or runoff from yards, roadways or other compacted surfaces, or runoff from poorly draining soils, resulting in excess nutrients in surface waters. The pollution impact potential map showing areas of relative risk for phosphorus loss from agriculture to surface water is given in Appendix 6.

4.2.2 Urban waste water treatment plants

- Urban Waste Water Treatment Plants (WWTPs) and agglomeration networks have been highlighted as a significant pressure in three *At Risk* water bodies; details are given in Table 7 and Figure 13. Kilmacthomas WWTP, which impacts Mahon_020, was due to be upgraded in 2016.

Table 7. Waste Water Treatment Plants and agglomerations identified as Significant Pressures in *At Risk* water bodies and expected completion dates for associated upgrade works, where applicable.

Facility name	Facility Type	Water Body	2010-15 Ecological Status	Expected Completion Date
Kill A0380	< 500 p.e.	Kilmurrin Cove Stream_010	Unassigned	*N/A* [1]
Kilmacthomas D0275	1,001 to 2,000 p.e.	Mahon_020	Poor	2016
Dungarvan D0017	> 10,000 p.e.	*Colligan Estuary*[2]	Moderate	*N/A* [1]

4.2.3 Domestic waste water

- Domestic waste water has been identified as a significant pressure in two river water bodies (Dunhill_010 and Brickey_010) and one groundwater body (Tramore) (Figure 14). This is due to a concentration of unsuitable domestic waste water treatment systems and unlicensed discharges in close proximity to the water bodies. The significant issues are a combination of excess nutrients entering surface waters and microbiological contamination. Furthermore, several septic tank systems are mapped in areas of karst.

4.2.4 Other significant pressures

- *Unknown Anthropogenic*
  Collgan_040 is an *At Risk* water body which has unknown anthropogenic pressures (Figure 15).

- *Waste*
  The significant pressure affecting the Waste Facility (W0032-02) IE_SE_G_178 groundwater body is the waste facility W0032-02 (Figure 15).

4.2.5 Forestry

- Forestry has been identified as a significant pressure in the Tay_010 river water body (Figure 16). The significant activity is clearfelling, with an area felled in relatively close proximity to the monitoring point during 2010-12 monitoring, which has resulted in heavy siltation and excess nutrients in the surface water body.

[1] *Currently not specified in improvement plans.*
[2] *The Dungarvan agglomeration network, rather than the WWTP, has been identified as a pressure impacting the Colligan Estuary.*

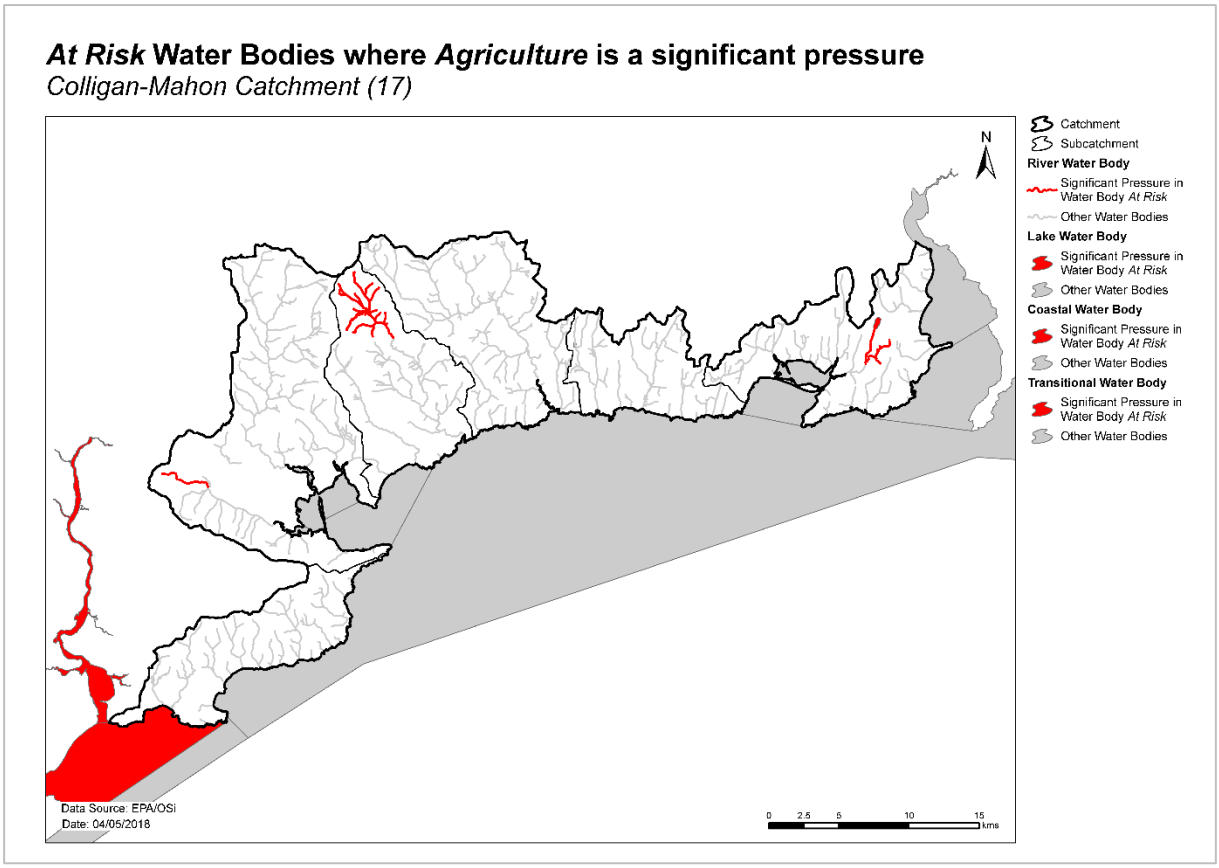


Figure 12. Water bodies that are *At Risk* and are impacted by agricultural activities

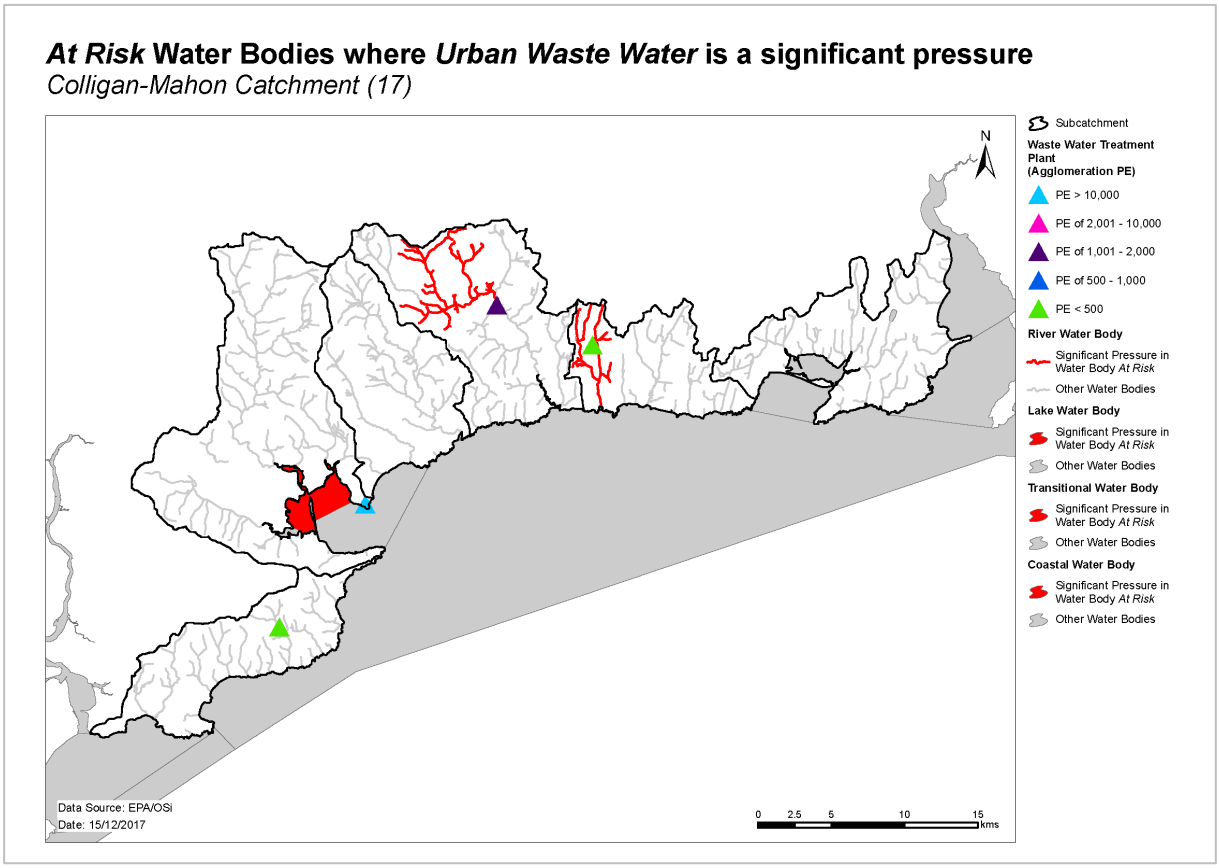


Figure 13. Water bodies that are *At Risk* and are impacted by urban waste water

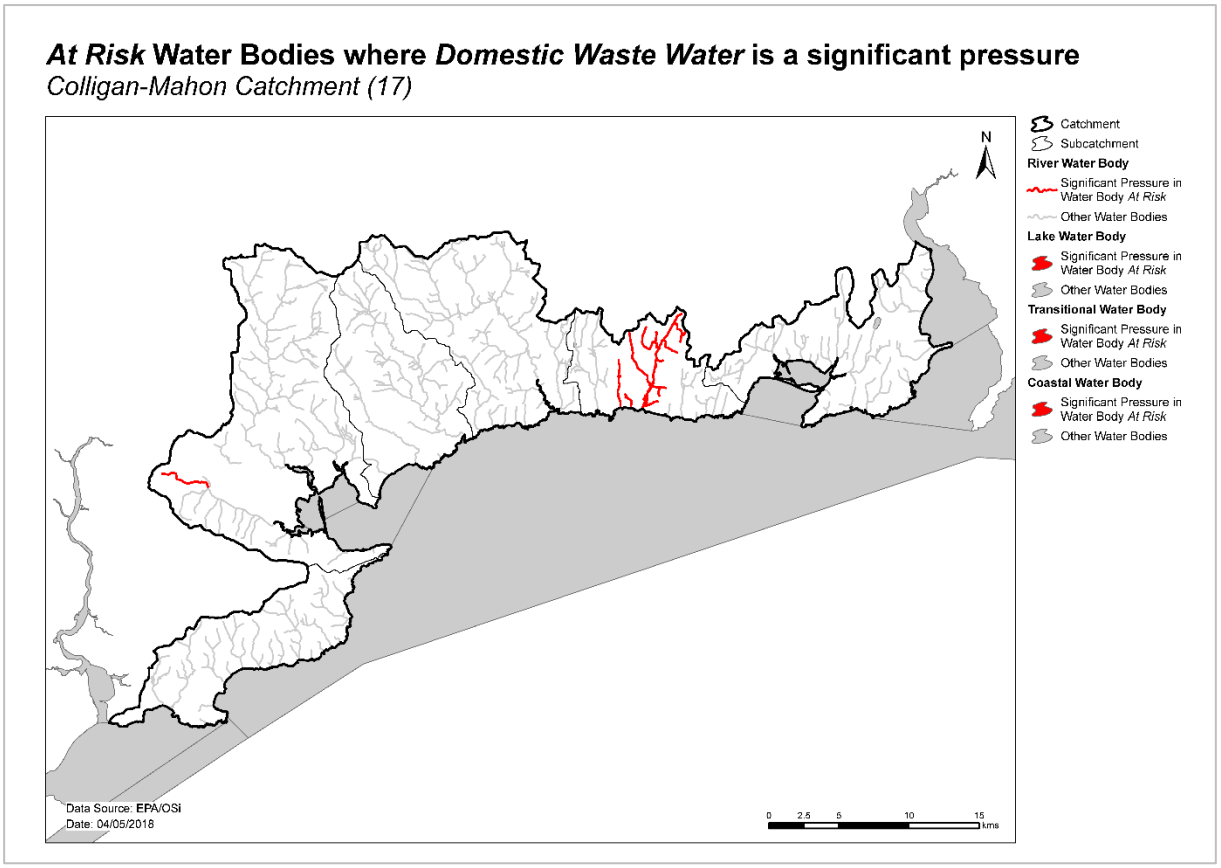


Figure 14. Water bodies that are *At Risk* and are impacted by domestic waste water

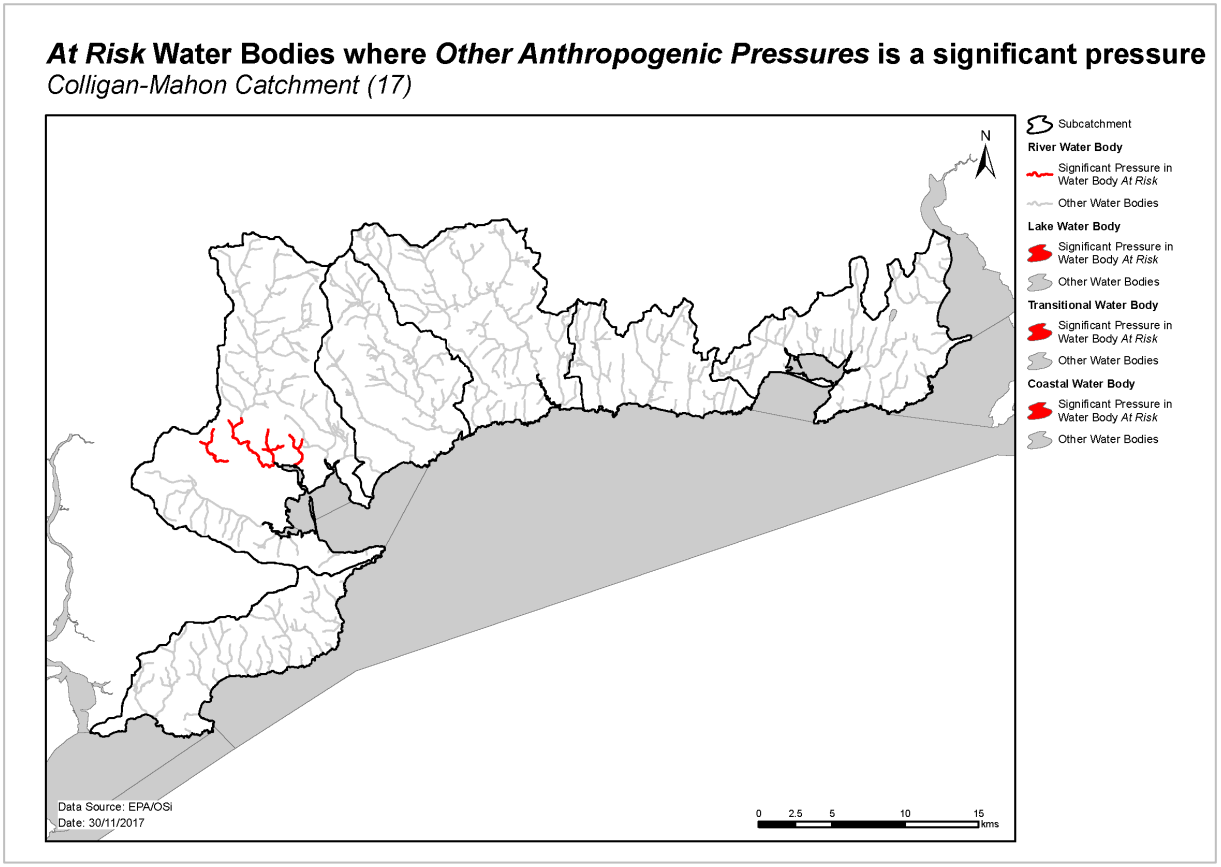


Figure 15. Water bodies that are *At Risk* and are impacted other anthropogenic pressures

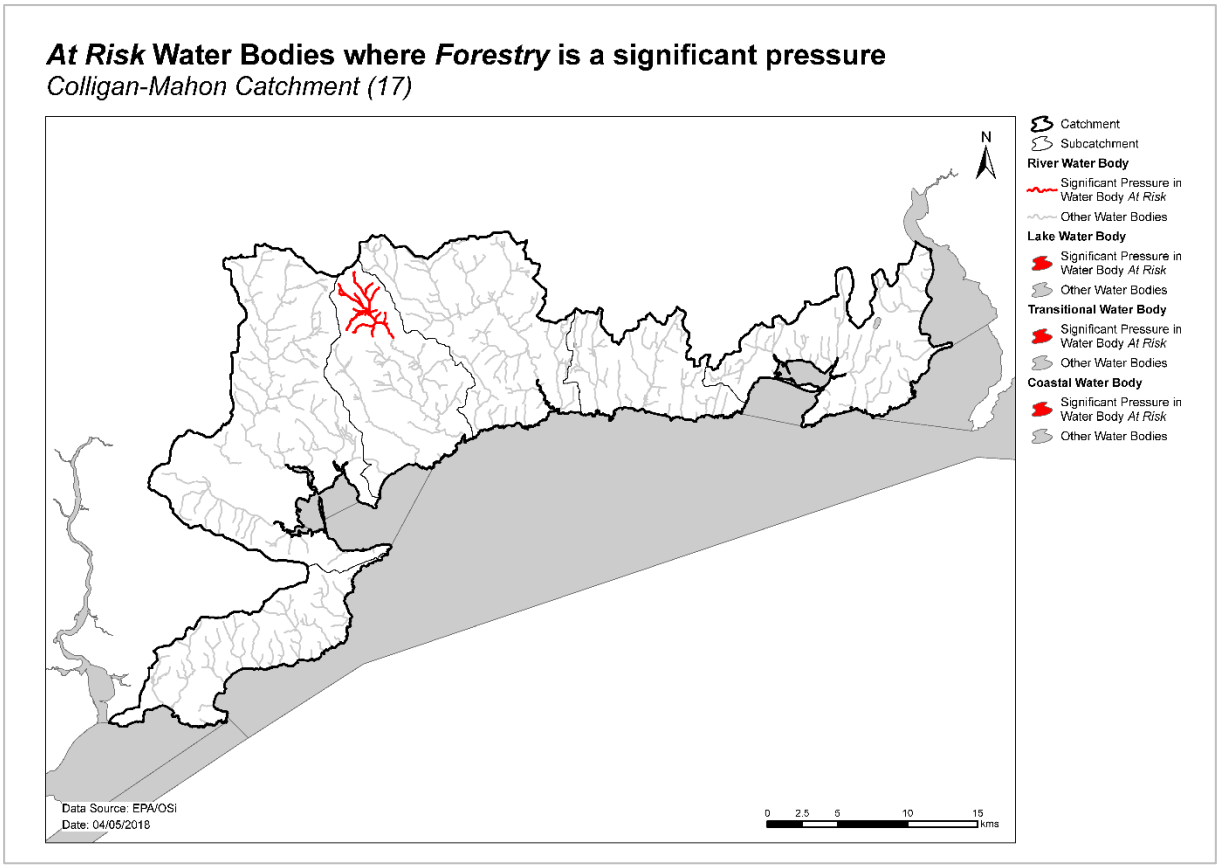


Figure 16. Water bodies that are *At Risk* and are impacted by forestry activities

5 Load reduction assessment

5.1 River water body load reductions

- The results of the main channel assessment for the Colligan-Mahon catchment indicate that orthophosphate is moderately low along the Mahon main channel and TON concentrations increase steadily downstream (Appendix 2).
- For water bodies where phosphorus monitoring data are available, the reduction in P load that would be required to bring the mean concentration back to the EQS of 0.035 mg/l as P, can be estimated using a simple method based on the average 2013 to 2015 concentration and the average flow, or the estimated 30th percentile flow (Q30) where flow data are not available. The relative load reductions are ranked on a national scale from Very High (>1 kg/Ha/y), to High (0.5-1 kg/Ha/y), to Medium (0.25-0.5 kg/Ha/y) to Low (<0.25 kg/Ha/y). Note that P load reductions may also be required in other water bodies, but without chemistry monitoring data a quantitative estimate cannot be calculated.
- In the Colligan Mahon catchment, water chemistry data are available for 13 of the 37 water bodies monitoring stations. The available data indicate that P load reduction is required in one river water body (Table 9).

Table 9. Relative load reductions required in monitored water bodies that are *At Risk.*

Water body	P Load Reduction Required
Kilmurrin Cove Stream_010	Low

- The nitrate assessment is aimed at reducing the nitrate loading to the associated TraC water bodies. For water bodies where nitrate monitoring data are available, the reduction in TON load that would be required to bring the annual concentrations back to 2.60 mg/l can be estimated.
- In the Colligan-Mahon catchment, the available data indicate that N load reductions are required in 13 river water bodies (Table 10).

Table 10. Relative load reductions required in monitored water bodies.

Water body	N Load Reduction Required
COLLGAN_040	High
BRICKEY_020	High
MAHON_020	High
TAY_030	High
COLLIGAN_020	High
MAHON_030	High
DUNHILL_010	Med
BRICKEY_010	High
MAHON_040	Med
KILMURRIN COVE STREAM_010	Med
TAY_010	Low
ARAGLIN (COLLIGAN)_010	Low
MAHON_010	Low

5.2 TraC load reductions

Some 18 estuaries in Ireland have been monitored on a continual basis since 1990 as part of Ireland's commitment under the Convention for the Protection of the Marine Environment of the North-East Atlantic (the Ospar Convention). This has shown that generally over the long term, nutrients have decreased but further reduction will be required in many cases to support Good Ecological Status. However, many estuaries have not been monitored to the same degree, and where monitoring data in insufficient, an ongoing programme of modelling has been undertaken to estimate potential nutrient load removal from contributing sub-catchments.

Different estuaries may require reductions in different nutrients. Further modelling work is required to determine precisely what load reductions are required, but in the interim, further monitoring will be carried out to assess the improvements resulting from various planned measures, and to confirm the nature of the issues.

- The Colligan Estuary is impacted by excess nutrients which are derived from the lower reaches of the Colligan (Colligan_040) and the agglomeration network issues in Dungarvan. The estuary is N limited which indicates that reductions in nitrogen loads will be required. However, the estuary can also be P limited in summer. Estuarine modelling has not been carried out and therefore the extent of the load reduction that is required cannot be estimated. However, as a first step, reduction of N losses through remediation of the network issues, and reductions of nutrients generally from the Colligan River catchment, particularly Colligan_040, should be carried out.

- The Brickey Estuary which is connected to the Colligan Estuary is unmonitored and is therefore in *Review.* Based on visual evidence it is highly likely that the estuary has water quality issues that are like the Colligan estuary. The inflowing Brickey River also has elevated nutrients derived largely from agricultural practices. Further monitoring is required.
- Load reductions for the Lower Blackwater M Estuary / Youghal Harbour and Youghal Bay are outlined in the Blackwater Catchment Assessment.

6 Further characterisation and local catchment assessments

- Further characterisation through local catchment assessments is needed in eight of the *At Risk* water bodies to refine the understanding of the significant pressures at the site/field scale so that specific and targeted measures can be identified.
- Further characterisation through local catchment assessments is needed in 19 of the *Review* water bodies to refine the understanding of the significant pressures at the site/field scale so that specific and targeted measures can be identified.
- Brief definitions on the 10 IA assessment scenarios are given in Appendix 7.

Table 11. Local catchment assessment allocation for *At Risk* and *Review* river and lake water bodies in the catchment

Risk	IA 1	IA 2	IA 3	IA 4	IA 5	IA 6	IA 7	IA 8	IA 9	IA 10	Total
At Risk	2	2	0	1	2	0	1	1	0	0	**9**
Review	0	1	16	0	1	2	1	0	0	0	**21**
Note water bodies may have multiple categories of Local Catchment Assessments											

7 Catchment summary

- Of the 37 rivers and lake water bodies, eight are *At Risk* of not meeting their WFD objectives.
- Excess ammonia and phosphate are the dominant issues in rivers and lakes in Colligan Mahon Catchment, which are likely to be attributed to pressures that include agriculture, urban waste water, domestic waste water and forestry. While pollution from organic matter is also a concern, this is only for a limited number of water bodies.
- There are three *At Risk* transitional water bodies – the Colligan Estuary, Lower Blackwater M Estuary / Youghal Harbour and Youghal Bay. Nitrates and excessive nutrients are the significant issues in this catchment. The Lower Blackwater M Estuary / Youghal Harbour and Youghal Bay are shared with the Blackwater catchment.
- There are two *At Risk* groundwater bodies – IE_WE_G_0084, Waste Facility (W0032-02) due to ammonia, and Tramore due to phosphates that have the potential to impact on associated *At Risk* surface water bodies.

8 Areas for Action

The characterisation outcomes described above have highlighted that there is significant work to do in the catchment to protect and restore water quality, and meet the objectives of the WFD. During the development of the draft river basin management plan it became apparent that there would be a need to prioritise areas for collective action so that the best return on investment could be achieved. 190 Areas for action have been selected nationally in a process as described below. There are three areas for action in the Colligan/Mahon catchment.

8.1 Process of Selection

Following the publication of the draft river basin management plan in early 2017, the EPA and the Local Authority Waters and Communities Office (LAWCO) jointly led a collaborative regional workshop process to determine where, from a technical and scientific perspective, actions should be prioritised in the second cycle. The prioritisation process was based on the priorities in the draft river basin management plan, the evidence from the characterisation process, and the expertise, data and knowledge of public body staff with responsibilities for water and the different pressure types. The recommended areas for action selected during the workshops were then agreed by the Water and Environmental Regional Committees. Since this selection, the Local Authorities Water and Communities Office (LAWCO) have undertaken public engagement and feedback sessions in each local authority.

The recommended areas for action are an initial list of areas where action will be carried out in the second cycle. All water bodies that are At Risk still however, need to be addressed. As issues are resolved, or when feedback from the public engagement process is assessed, areas for action may be removed from the list and new areas will be added. If additional monitoring shows that new issues have arisen, new areas may become a priority and may need to be added to the work programme.

The initial list of areas for action is not therefore considered as a closed or finite list; it simply represents the initial areas where work will be carried out during the second WFD planning cycle from 2018 to 2021.

8.2 Outcomes of process

The outcomes for the Colligan Mahon catchment are summarised below.

- Three recommended areas for actions (Table 12, Figure 17) were selected.
- These are the Colligan-Bricky, Tay, and Dunhill.
- These include:
    - 10 river water bodies – five *At Risk* and five *Review,* and
    - Two transitional water bodies – one *At Risk* and one *Review.*
- Two groundwater bodies, that are *At Risk* or *Review* due to groundwater contribution of nutrients to surface water bodies, intersect with three of the recommended areas for action, see Table 13. Actions taken to improve surface water will need to take account of the groundwater contribution to surface water.

A remaining 22 *At Risk* and *Review* surface water bodies were not included in the recommended areas for action for the second cycle. The distribution of these is presented in Figure 18. These include:

- 17 river and lake water bodies – three *At Risk* and 14 *Review,* and
- Five transitional water bodies – *two at risk and three review*

Table 12. Recommended Areas for Action in the Colligan Mahon catchment

Recommended area for action	Number of water bodies	SCs	Local authority	Reason for Selection
Colligan-Bricky	8	17_6	Waterford	• One deteriorated water body that is discharging into Colligan estuary (moderate status). • One Poor status water body that is discharging into Bricky estuary, an estuary where macroalgae is increasing. • Opportunity to build on existing knowledge of Inland Fisheries Ireland and Irish Water regarding two unlicensed discharges from pumping stations at Moate and Ballynagaul in Killongford_010 into Dungarvan Harbour shellfish area. • Important fisheries (sea trout, sea bass, oyster industry). • Important for birds (SPA). • Active CLAMs (coordinated local aquaculture management) group in Newry. • Important habitat for natural oyster beds.
Tay	2	17_4	Waterford	• Discharges into popular bathing area (Stradbally) • Discharges into an important sea bass fishery • One deteriorated High Ecological Status objective water body. • One potential 'quick win'.
Dunhill	2	17_1	Waterford	• Building on work completed by Waterford County Council. • Discharges into green coast bathing area. • Potential to coordinate with recent work: Integrated Constructed Wetland development, local community work to naturalise stream and biodiversity study completed by Irish Water. • One deteriorated water body.

Table 13 Groundwater bodies intersecting with surface water bodies in Recommended Areas for Action

Groundwater bodies			Intersecting surface water bodies		Recommended Area for Action
Code	Name	Risk	Code	Name	
IE_SE_G_014	Ballyknock	Review	IE_SE_17C010300	COLLGAN_040	Colligan-Bricky
IE_SE_G_014		Review	IE_SE_17C010300	COLLGAN_040	
IE_SE_G_014		Review	IE_SE_17D030100	DEELISH STREAM_010	
IE_SE_G_014		Review	IE_SE_17C390620	CUSHCAM_010	Tay
IE_SE_G_146	Tramore	At risk	IE_SE_17D020300	DUNHILL_010	Dunhill
IE_SE_G_146		At risk	IE_SE_17K030200	KILMURRIN COVE STREAM_010	

9 Environmental Objectives

The environmental objectives are the target status for each *At Risk* or *Review* water body and the date by which that status is expected to be achieved (Appendix 3). Where a water body is *Not at Risk* and is already at its target status, the environmental objective is deemed to have been met.

9.1 Surface Water

- Assuming resources are available and actions are taken in the recommended areas for action, of the six *At Risk* surface water bodies, it is predicted that 1 (17%) will improve by 2021 and 5 (83%) will achieve their objective by 2027. For the six *Review* surface water bodies, the absence of information on these water bodies means that there is no scientific basis to quantify an environmental objective date and therefore a 2027 date is set, see Table 14.

Table 14. Environmental objective dates for water bodies in the Recommended Areas for Action

Risk Category	No. of Water Bodies	No. of WBs for 2021 Improvement	No. of WBs for 2027 Status Improvement
Rivers			
At Risk	5	1	4
Review	5	0	5
TraC			
At Risk	1	0	1
Review	1	0	1
Total	12	1	11

- Fifteen surface water bodies have met their 2015 environmental objective. Two of the 15 water bodies met their environmental objective for ecological status but failed to meet their protected area objectives.
- As action is not yet planned to be taken in four of the remaining five *At Risk* surface water bodies, a 2027 date is applied to all four water bodies. Due to planned upgrade works at an urban waste water treatment plant, a 2021 objective is applied to the fifth *At Risk* water body.
- For the 17 *Review* surface water bodies, the absence of information on these water bodies means that there is no scientific basis to quantify an environmental objective date and therefore a 2027 date is set, see Table 15.

Table 15. Environmental objectives dates in the *At Risk* and *Review* surface water bodies not included in Recommended Areas for Action

Risk Category	No. of Water Bodies	No. of WBs for 2021 Improvement	No. of WBs for 2027 Status Improvement
Rivers			
At Risk	2	1	1
Review	13	0	13
Lakes			
At Risk	1	0	1
Review	1	0	1
TraCs			
At Risk	2	0	2
Review	3	0	3
Total	22	1	21

9.2 Groundwater

- Nine of the ten groundwater bodies are currently Good status and, therefore, have met their environmental objectives.
- The one groundwater body, Waste Facility (W0032-02), in the Colligan Mahon catchment that is less than Good status has an environmental objective date of 2027.

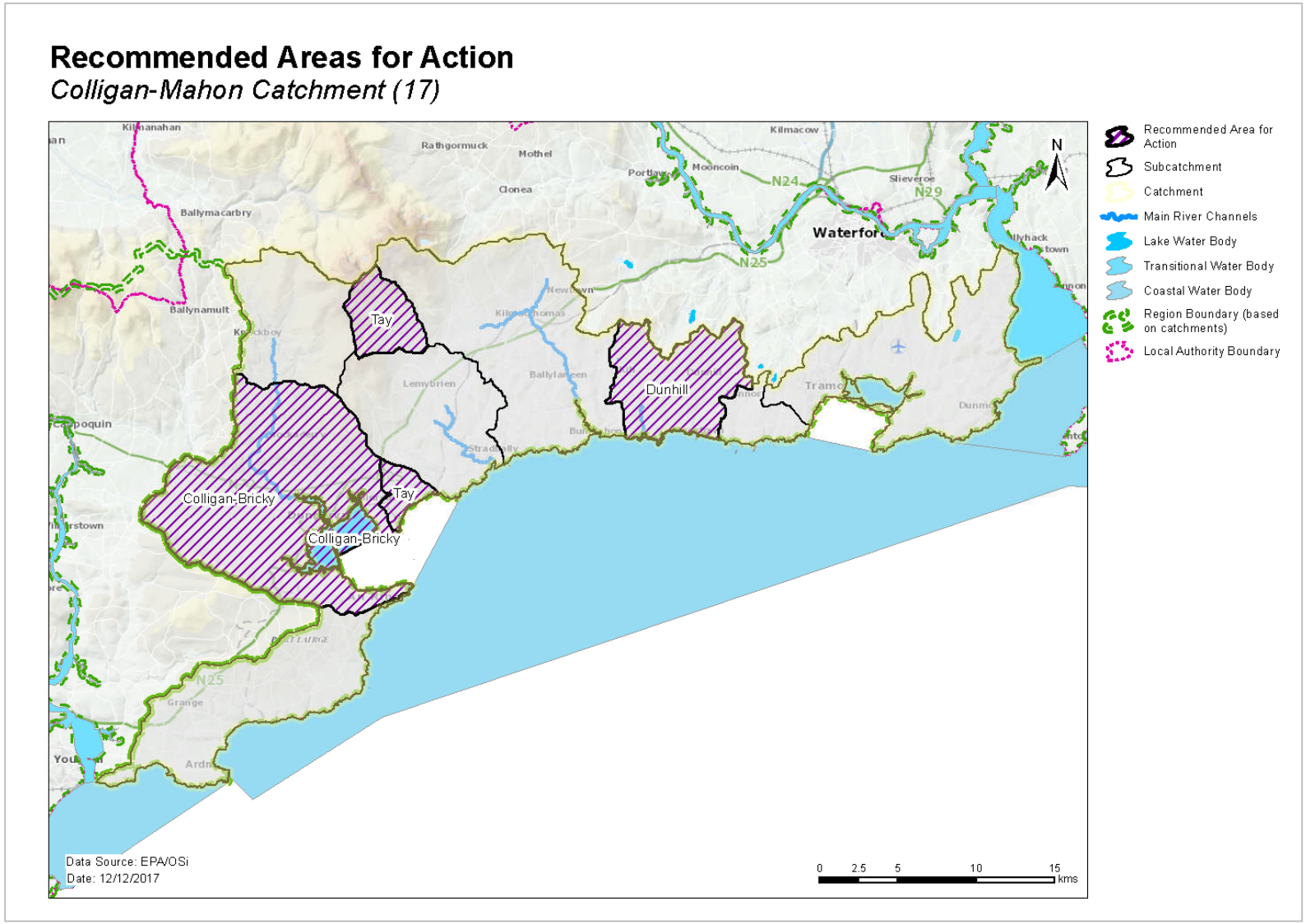


Figure 17. Location of Recommended Areas for Action in the Colligan Mahon Catchment

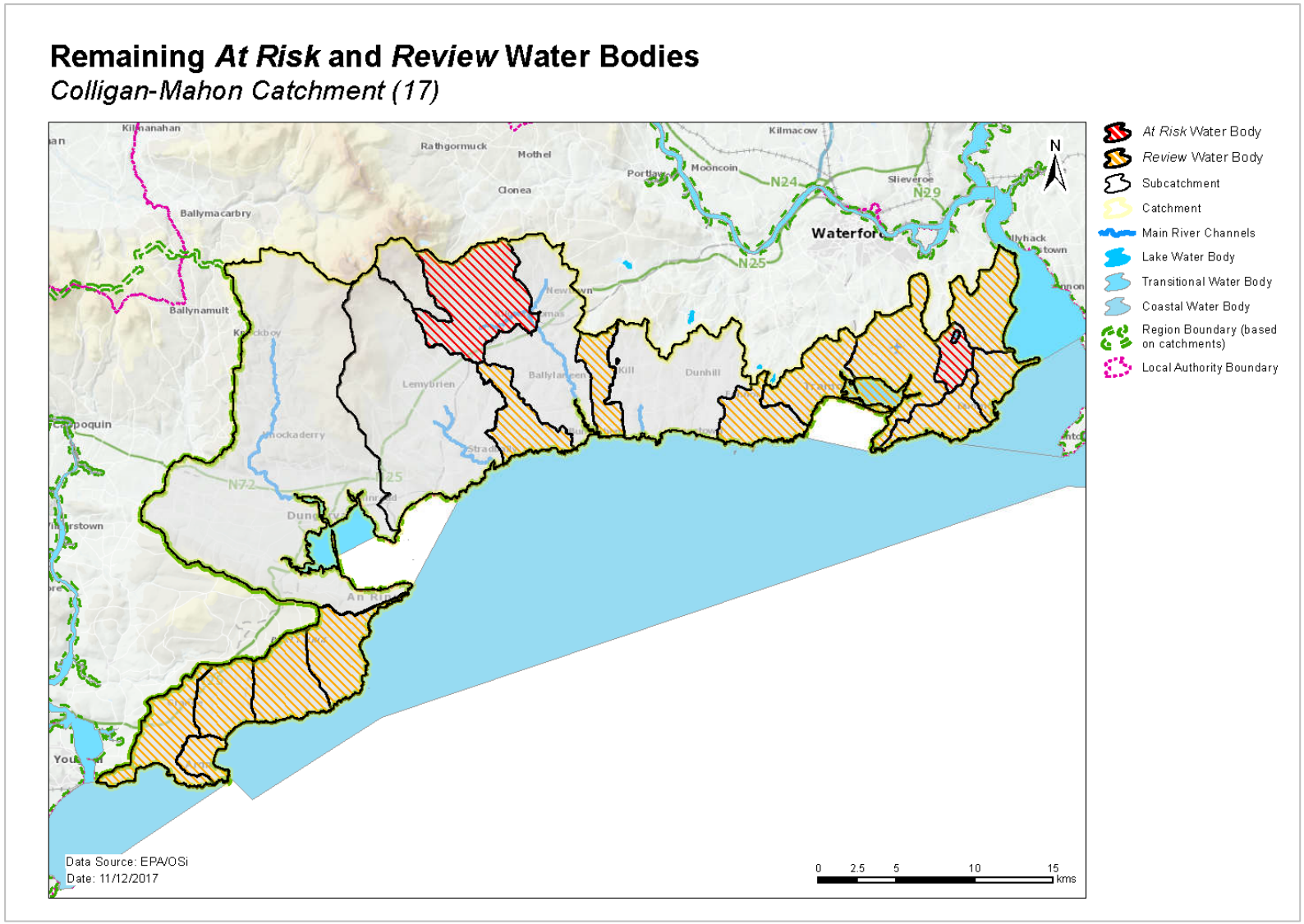


Figure 18. Location of *At Risk* and *Review* water bodies located outside Recommended Areas for Action in the Munster Blackwater Catchment

10 Acknowledgements

The Colligan Mahon Catchment Assessment (Version 3) has been produced by the Catchment Science & Management Unit, EPA, with the assistance of the following:

- Waterford City and County Council
- Cork County Council.
- Tipperary County Council.
- Inland Fisheries Ireland.
- Local Authorities Waters & Communities Office.
- Irish Water.
- RPS Group.
- Ecological Monitoring & Assessment Unit, EPA.
- Hydrometric & Groundwater Section, EPA.
- Informatics Section, EPA.
- Laboratories, EPA.
- Office of Environmental Enforcement, EPA.
- Department of Housing, Planning and Local Government.
- DAFM Agriculture.
- DAFM Forest Service.
- Coillte.
- Teagasc.
- Geological Survey Ireland.
- National Federation of Group Water Schemes.
- National Parks and Wildlife Service.
- Board Iascaigh Mhara.
- Marine Institute.
- Sea Fisheries Protection Authority.

Appendix 1 High ecological status objective water bodies and sites

Water body/ Site	Type	Codes	2015 Status
COLLIGAN_020	River	IE_SE_17C010150	High
DALLIGAN_010	River	IE_SE_17D010300	High
MAHON_010	River	IE_SE_17M010100	High
TAY_010	River	IE_SE_17T010050	Good
Tramore Back Strand	Coastal water body	IE_SE_120_0000	High

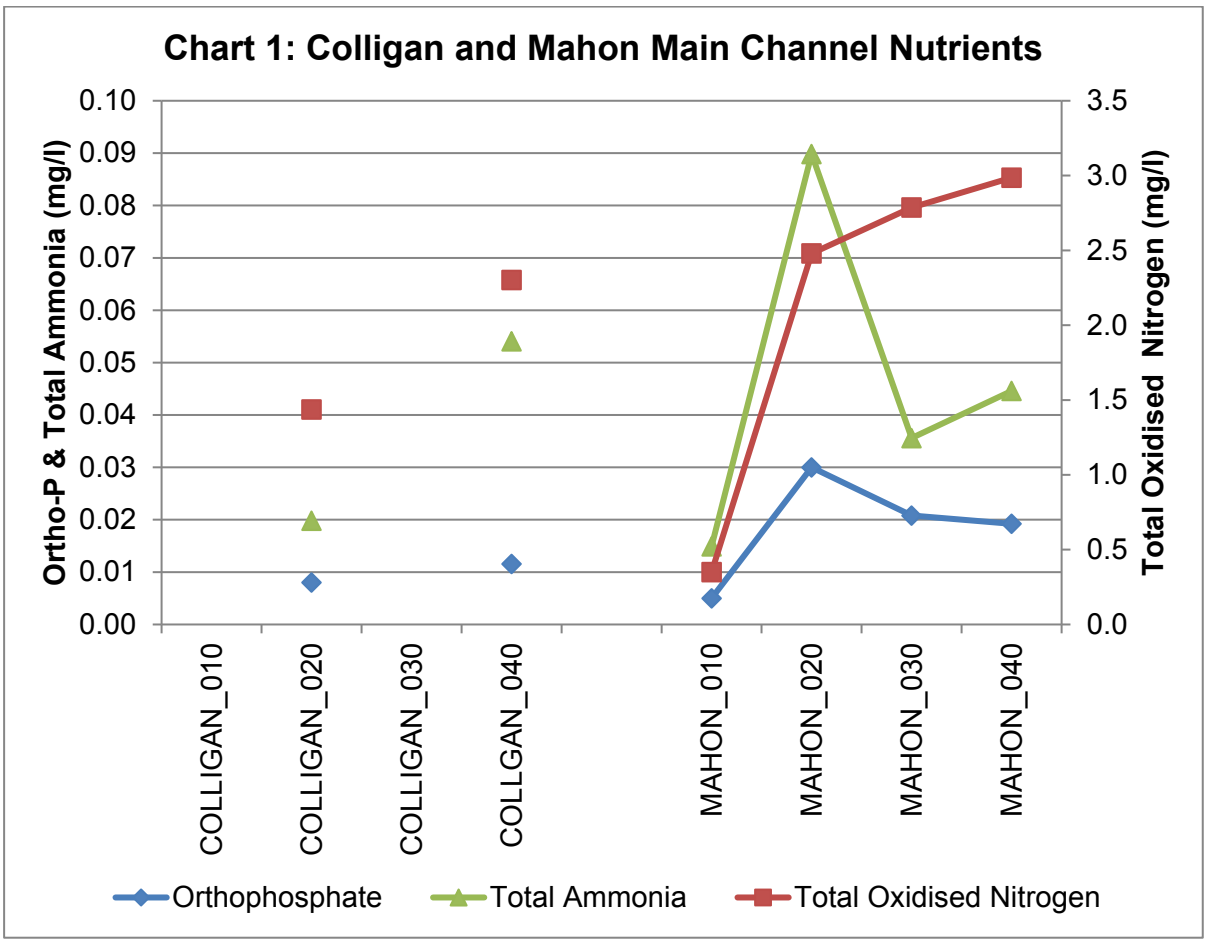
Appendix 2 Catchment scale nutrient concentrations and in-stream loads

The results of the in-stream water quality assessment for the Colligan and Mahon main channels are illustrated in Chart 1. Orthophosphate results in the Colligan main channel increase from 0.08 to 0.012mg/l downstream and remain well below the EQS for good status (0.035mg/l). Only two of the four Colligan main channel water bodies have chemistry data associated with them. The orthophosphate concentrations throughout the Mahon main channel are also moderately low and range from 0.005 to 0.030mg/l.

Ammonia concentrations in the Colligan main channel increase from 0.020 to 0.054mg/l, and remain below the EQS for good status (0.065mg/l). Along the Mahon main channel, ammonia concentrations show a significant spike at Mahon_020, exceeding the EQS and decreases downstream to below the EQS.

TON concentrations along the Colligan main channel increase downstream, but remain below the 2.6mg/l threshold value. The TON concentrations along the Mahon main channel become elevated from Mahon_020 above the threshold and increase steadily downstream.

The nutrient loadings, as shown in Chart 2, show similar trends to the concentrations trends in Chart 1.



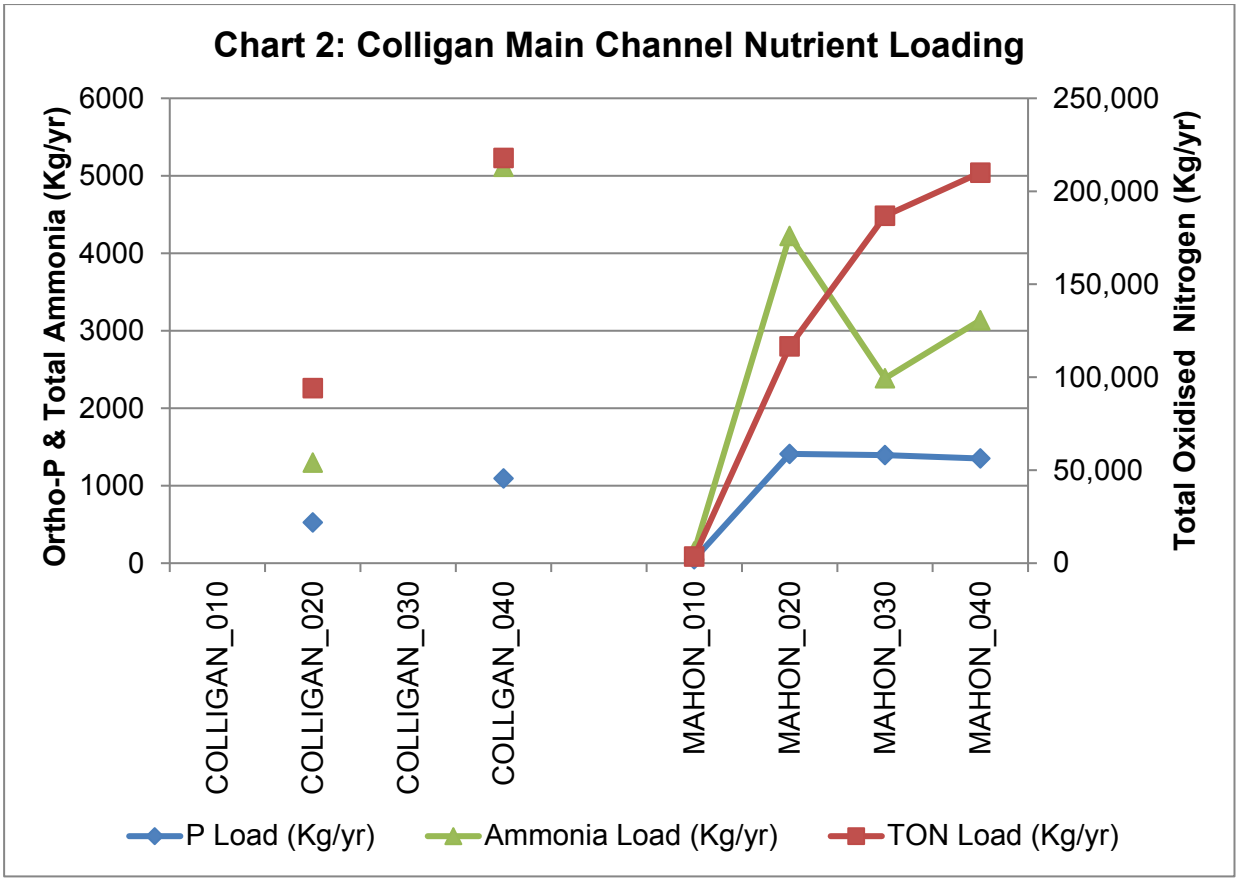


Chart 2: Colligan Main Channel Nutrient Loading
Ortho-P & Total Ammonia (Kg/yr)
Total Oxidised Nitrogen (Kg/yr)
6000
5000
4000
3000
2000
1000
0
250,000
200,000
150,000
100,000
50,000
0
COLLIGAN_010
COLLIGAN_020
COLLIGAN_030
COLLGAN_040
MAHON_010
MAHON_020
MAHON_030
MAHON_040
P Load (Kg/yr)
Ammonia Load (Kg/yr)
TON Load (Kg/yr)

Appendix 3 Summary information on *At Risk* and Review surface water bodies

Subcatchment code	Water body code	Water body name	Water body type	Risk	Ecological Status 07-09	Ecological Status 10-15	High Ecological Status Objective Water Body Y/N	Significant Pressures	Date to Meet Environmental Objective	Recommended Area for Action Name
17_1	IE_SE_17_6	Ballinlough	Lake	Review	Unassigned	Unassigned	N		2027	
17_1	IE_SE_17F070820	Fennor_North_010	River	Review	Unassigned	Unassigned	N		2027	
17_1	IE_SE_17K030200	Kilmurrin Cove Stream_010	River	At risk	Unassigned	Unassigned	N	UWW	2027	Dunhill
17_1	IE_SE_17D020300	Dunhill_010	River	At risk	Moderate	Poor	N	DWW	2027	Dunhill
17_2	IE_SE_17B290990	Ballygunnermore_010	River	Review	Unassigned	Unassigned	N		2027	
17_2	IE_SE_17B400790	Ballymabin_010	River	Review	Unassigned	Unassigned	N		2027	
17_2	IE_SE_17K210690	Cooltegin_010	River	Review	Unassigned	Unassigned	N		2027	
17_2	IE_SE_17_5	Belle	Lake	At risk	Moderate	Moderate	N	Ag	2027	
17_2	IE_SE_17K410990	Knockacurrin_010	River	Review	Unassigned	Unassigned	N		2027	
17_2	IE_SE_17M060970	Monloum_010	River	Review	Unassigned	Unassigned	N		2027	
17_2	IE_SE_17L010300	Leperstown Stream_010	River	At risk	Poor	Poor	N	Ag	2027	
17_2	IE_SE_100_0000	Waterford Harbour	Coastal	Review	Good	Good	N		2027	Waterford Harbour
17_2	IE_SE_120_0000	Tramore Back Strand	Coastal	Review	High	High	Y		2027	
17_3	IE_SE_17B030100	Ballyvaden Str_010	River	Review	Unassigned	Unassigned	N		2027	
17_3	IE_SE_17F050990	Faha 17_010	River	Review	Unassigned	Unassigned	N		2027	
17_3	IE_SE_17M010200	Mahon_020	River	At risk	Moderate	Poor	N	UWW	2021 (measures planned)	
17_3	IE_SE_130_0100	Mahon Estuary	Transitional	Review	Unassigned	Unassigned	N		2027	
17_4	IE_SE_17C390620	Cushcam_010	River	Review	Unassigned	Unassigned	N		2027	Tay
17_4	IE_SE_17T010050	Tay_010	River	At risk	High	Good	Y	Ag,For	2021	Tay
17_5	IE_SE_17A050900	Addrigoole_010	River	Review	Unassigned	Unassigned	N		2027	
17_5	IE_SE_17B200760	Ballylangadon_010	River	Review	Unassigned	Unassigned	N		2027	
17_5	IE_SE_17D090400	Duffcarrick 17_010	River	Review	Unassigned	Unassigned	N		2027	
17_5	IE_SE_17M100650	Maoil_An_Choirnigh_010	River	Review	Unassigned	Unassigned	N		2027	
17_5	IE_SE_17S030780	An_Screathan_010	River	Review	Unassigned	Unassigned	N		2027	
17_5	IE_SW_020_0000	Youghal Bay	Coastal	At risk	Good	Good	N	Ag	2027	
17_5	IE_SW_020_0100	Lower Blackwater M Estuary / Youghal Harbour	Transitional	At risk	Moderate	Moderate	N	Ag	2027	
17_6	IE_SE_17B010090	Brickey_020	River	Review	Unassigned	Unassigned	N		2027	Colligan-Bricky
17_6	IE_SE_17C010180	Colligan_030	River	Review	Unassigned	Unassigned	N		2027	Colligan-Bricky
17_6	IE_SE_17D030100	Deelish Stream_010	River	Review	Unassigned	Unassigned	N		2027	Colligan-Bricky
17_6	IE_SE_17B010050	Brickey_010	River	At risk	Poor	Poor	N	Ag,DWW	2027	Colligan-Bricky

Subcatchment code	Water body code	Water body name	Water body type	Risk	Ecological Status 07-09	Ecological Status 10-15	High Ecological Status Objective Water Body Y/N	Significant Pressures	Date to Meet Environmental Objective	Recommended Area for Action Name
17_6	IE_SE_17K380650	Killongford_010	River	Review	Unassigned	Unassigned	N		2027	Colligan-Bricky
17_6	IE_SE_17C010300	Collgan_040	River	At risk	Good	Moderate	N	Other	2027	Colligan-Bricky
17_6	IE_SE_140_0100	Colligan Estuary	Transitional	At risk	Moderate	Moderate	N	UWW	2027	Colligan-Bricky
17_6	IE_SE_140_0200	Brickey Estuary	Transitional	Review	Unassigned	Unassigned	N		2027	Colligan-Bricky

Ag: Agriculture

DWW: Domestic Waste Water

For: Forestry

Hymo: Hydromorphology

Ind: Industry

M+Q: Mines and Quarries

Peat: Peat Drainage and Extraction

DU: Diffuse Urban

UWW: Urban Waste Water

Note: Significant Pressures for Review water bodies have not been included as they will need to be confirmed as part of an Investigative Assessment.

Protected Area: If a water body is one or more of the following: Drinking Water Protected Area; Bathing Water; Shellfish Area; Nutrient Sensitive Area or; a Natura 2000 site with a water dependent qualifying interest with a water quality and/or quantity conservation objective, then it has been highlighted as a protected area in this table.

Appendix 4 Drinking water supplies in the catchment

Scheme Code	Scheme Name	Water Body	Water Body Code	Objective met? Yes /No	Reason why not met
3100PRI3109	Ardnahoe Group Water Scheme	Tramore	IE_SE_G_146	Yes	N/A
3100PRI3124	West Waterford Golf Club	Dungarvan	IE_SE_G_052	Yes	N/A
3100PRI3105	Coolnasmear National School	Kilrion	IE_SE_G_085	Yes	N/A
3100PRI3101	Dunhill National School	Tramore	IE_SE_G_146	Yes	N/A
3100PRI3102	Fenor National School	Tramore	IE_SE_G_146	Yes	N/A
3100PRI3103	Newtown School	Tramore	IE_SE_G_146	Yes	N/A
3100PRI3104	Seafield National School	Tramore	IE_SE_G_146	Yes	N/A
3100PRI3106	St. Declans School	Tramore	IE_SE_G_146	Yes	N/A
3100PRI3114	Stradbally National School	Tramore	IE_SE_G_146	Yes	N/A
3100PRI3111	Ardmore Ronans	Helvick Head	IE_SE_G_073	Yes	N/A
3100PUB1052	Graiguearush	Kilrion	IE_SE_G_085	Yes	N/A
3100PUB1040	Dunhill Cois Coille	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1141	Dunhill Ballynageeragh	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1043	Faha	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1045	Fews	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1046	Garrahylish	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1051	Graiguenageeha	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1039	Dungarvan	Dungarvan	IE_SE_G_052	Yes	N/A
3100PUB1004	Ardmore (Monea)	Helvick Head	IE_SE_G_073	Yes	N/A
3100PUB1022	Comeragh (Briska Lower)	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1010	Ballyguiry	Helvick Head	IE_SE_G_073	Yes	N/A
3100PUB1152	Ballydermody	Tramore	IE_SE_G_146	No	Nitrates
3100PUB1135	Ardmore (Liskealty)	Helvick Head	IE_SE_G_073	Yes	N/A
3100PUB1001	Adramone	Helvick Head	IE_SE_G_073	Yes	N/A
3100PUB1018	Ballyogarty	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1039	Dungarvan	Dungarvan	IE_SE_G_052	Yes	N/A
	Dungarvan	Dungarvan	IE_SE_G_052	Yes	N/A
3100PUB1005	Deelish (Ballinacourty)Deelish (Ballinacourty)	Kilrion	IE_SE_G_085	Yes	N/A
	Deelish (Ballinacourty)Deelish (Ballinacourty)	Kilrion	IE_SE_G_085	Yes	N/A
	Deelish (Ballinacourty)	Kilrion	IE_SE_G_085	Yes	N/A
3100PUB1023	Crough	Kilrion	IE_SE_G_085	Yes	N/A
3100PUB1039	Dungarvan	Dungarvan	IE_SE_G_052	Yes	N/A
3100PUB1036	Currabaha West	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1061	Kilgobnet	Kilrion	IE_SE_G_085	Yes	N/A
3100PUB1064	Kilmacthomas	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1067	Kilnafrehan	Kilrion	IE_SE_G_085	Yes	N/A
3100PUB1069	Kilrossanty	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1072	Knockyelan	Tramore	IE_SE_G_146	Yes	N/A

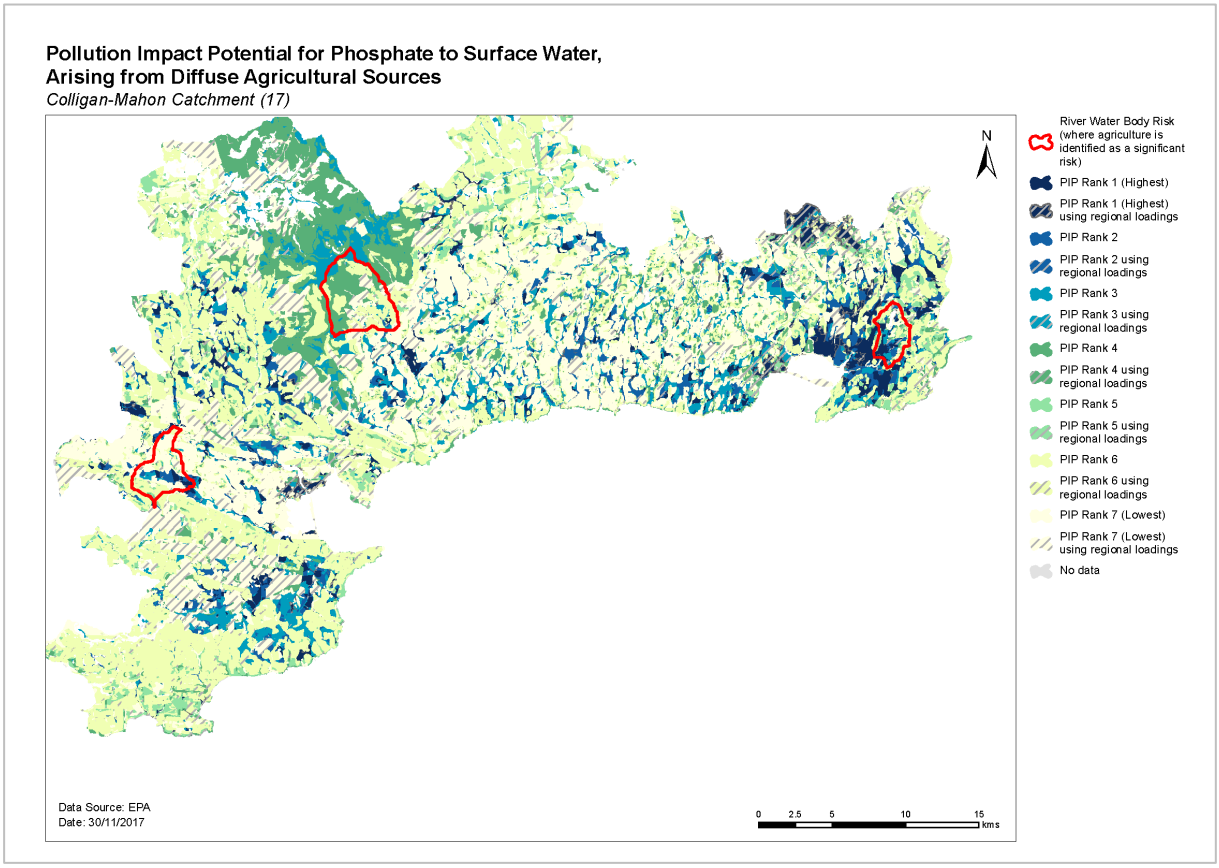
Scheme Code	Scheme Name	Water Body	Water Body Code	Objective met? Yes /No	Reason why not met
3100PUB1056	Kealfoun	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1075	Leagh Cross	Helvick Head	IE_SE_G_073	Yes	N/A
3100PUB1104	Kilbrien (Ballinakill)	Kilrion	IE_SE_G_085	Yes	N/A
3100PUB1053	Grallagh	Glenville	IE_SW_G_037	Yes	N/A
3100PUB1114	Old Parish (Loskeran Borehole)	Helvick Head	IE_SE_G_073	Yes	N/A
3100PUB1145	Old Parish (Loskeran Gates)	Helvick Head	IE_SE_G_073	No data	N/A
3100PUB1085	Roberts Cross	Helvick Head	IE_SE_G_073	Yes	N/A
3100PUB1087	Scrahan	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1147	Pairc an Aonaigh	Tramore	IE_SE_G_146	Yes	N/A
3100PUB1110	East Waterford Water Supply Scheme	Mahon_040	IE_SE_17M010350	No data	N/A
3100PUB1106	Ballylaneen	MAHON_030	IE_SE_17M010300	Yes	N/A
3100PUB1130	Ballyvadden	Ballyvaden str_010	IE_SE_17B030100	Yes	N/A
3100PUB1093	Stradbally	TAY_030	IE_SE_17T010400	Yes	N/A
3100PUB1084	Ring/Helvick/Seaview	Maoil_an_Choirnigh_010	IE_SE_17M100650	Yes	N/A

Appendix 5 Prioritisation of water bodies with Natura 2000 site qualifying interests

SAC Name	Relevant Qualifying interests	Target status	Water body type	Water bodies	Status (risk)	Prioritise?	Code	Survey data?
Ardmore Head SAC 002123	none							
Comeragh Mountains SAC 001952	none							
Glendine Wood SAC 002324	none							
Helvick Head SAC 000665	none							
River Barrow And River Nore SAC 002162	none							
Tramore Dunes And Backstrand SAC 000671	none							

Appendix 6 Pollution Impact Potential (PIP) Map for Phosphorus

For areas where agriculture is deemed as the significant pressure, areas of high risk to surface water can be targeted. The map below shows relative risk of loss of phosphorus to surface water. The risk of phosphorus losses is strongly correlated on whether the land is poorly draining or free draining and the loadings applied i.e. significant loadings applied on poorly draining areas result in a high potential risk to surface water. However, this figure does not imply that actual losses from these areas are occurring but is a useful tool for informing where resources should be focused (i.e. by allowing high risk areas to be identified and prioritised for further investigation). PIP maps are available online at a scale of 1:20,000 and can be accessed by public bodies via the EDEN process.



Appendix 7 Local Catchment Assessment Categories

Category	Assessment & Measures Evaluation Details
IA1	Further information provision (e.g. from IFI, LAs, EPA)
IA2	Point source desk-based assessment
IA3	Assessment of unassigned status water bodies, requiring field visit(s)
IA4	Regulated point sources, requiring field visit/s
IA5	Stream (catchment) walk to evaluate multiple sources in a defined (1 km) river stretch (used as the basis for estimating resource requirements)
IA6	Stream (catchment) walk in urban areas
IA7	Stream (catchment) walk along >1 km river stretches
IA8	Stream (catchment) walk along high ecological status (HES) objective rivers
IA9	Lakes assessment, requiring field visits
IA10	Groundwater assessments, requiring field visits