

# **Report on River Water Quality in County Carlow**

## **2012**

### **Contents**

1. Overview
2. General Assessment & Trends
3. WFD Priority Polluted River Sites
4. 2012 Summary of Carlow Rivers
5. Maps

## 1. Overview

This report gives an assessment of river water quality in County Carlow in 2012. It should be read in conjunction with the main report and the appendices for a complete picture of water quality in the county.

The first section of this report gives a general assessment of the state of rivers in the county, with a graph showing trends in chemical quality since 2006. The next section identifies the WFD priority river sites (in terms of pollution) and the suspected causes of pollution. They were selected on the basis of having a Q value less than 4 (i.e. moderate or worse status), poor chemistry, or there were other significant pollution issues. The third section gives a summary assessment of water quality for each river, having regard to the relevant Q values and WFD criteria for the 4 key chemical parameters BOD, ammonium, o-phosphate and TON. Finally there is a set of maps indicating river water quality for these chemical parameters.

## 2. General Assessment & Trends

Physico-chemical monitoring indicates generally satisfactory conditions in the Clody, Deerpark, Slaney, Barrow (albeit with slightly elevated o-phosphate), Ballymurphy and Dinin. However the Aghalona, Black, Burren, Derreen, Derry, Douglas, Lerr and Old Leighlin Stream all have problems at certain locations.

Spikes in ortho-phosphate, ammonia, TON and BOD levels in rivers were observed more frequently during 2012 than in other years. This may be explained (at least in part) by the wet weather experienced particularly during summer 2012, which led to higher run-off into rivers and streams. However diffuse agricultural and municipal pollution remain significant contributory factors to poor river water quality. Further details of the priority polluted sites in the county are available in Table 2.

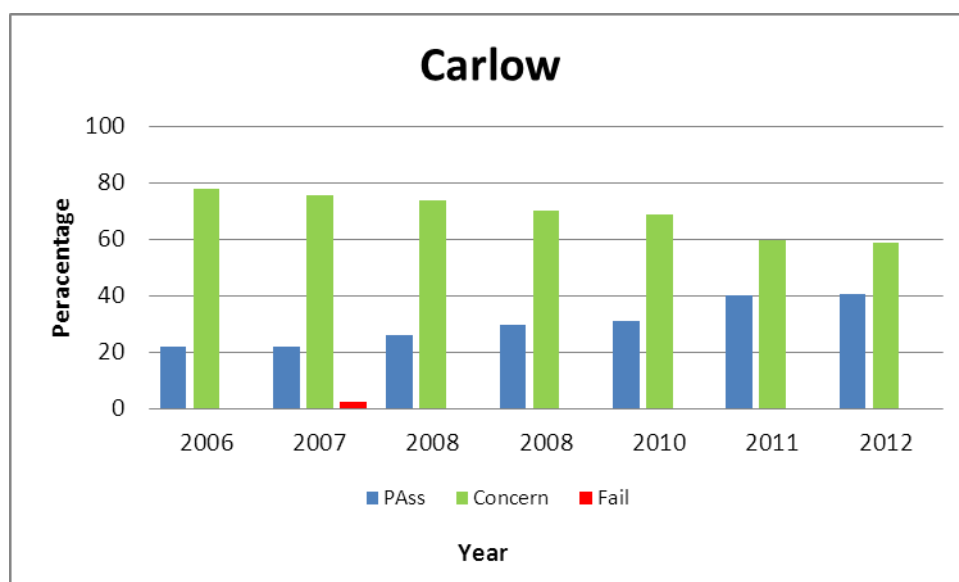
Chemical monitoring since 2006 indicates an improving trend in all Carlow rivers, with no sites failing chemistry since 2007, and the number of sites passing the criteria set for the four chemical parameters measured increasing every year since 2007 – see Figure 1. This trend is based on an assessment of the four most significant contributing parameters to water quality, namely BOD, ammonium, ortho-phosphate and TON, details of which are available at:

[https://www.epa.ie/wfdstatus/rivers/RW\\_Compliance\\_Rules\\_RiverChem\\_20110617.pdf](https://www.epa.ie/wfdstatus/rivers/RW_Compliance_Rules_RiverChem_20110617.pdf). Sites are identified as passing or failing based on an assessment of the mean and 95%ile of these parameters. Sites fail chemistry where 2 or more parameters fail the criteria set. While few sites fail two parameters, a significant number fail one (in the majority of cases this is due to TON). Where a site fails one parameter, it is described as being of concern.

While chemical monitoring indicates an improving trend, it is important to also remain focussed on maintaining the status of those sites that are already at good or higher status.

**Table 1: Chemical Quality in Carlow Rivers 2006-2012**

Year	Number of Stations	Pass	Of Concern	Fail
2006	55	12	43	0
2007	41	9	31	1
2008	42	11	31	0
2008	44	13	31	0
2010	45	14	31	0
2011	45	18	27	0
2012	44	18	26	0



**Figure 1: Trend in Chemical Quality in Carlow Rivers 2006-2012**

### 3. WFD Priority Polluted River Sites

There are over 900 river sites of less than good status across the country – that is they have a Q value of 3-4 or less. Table 2 lists those river sites in Carlow where the most recent Q value is 3-4 or less. There are up to three suspected causes of pollution listed for each site. Roughly 50% are polluted due to point sources and 50% due to diffuse sources. It is hoped that targeting pollution at these sites will lead to continued improvement in river water quality in the county.

This list may be useful in assisting with investigative monitoring, particularly of diffuse sources of pollution. The point source discharges may be dealt with separately through

licensing and enforcement measures. If sources of pollution affecting rivers can be reduced or eliminated, this will have a positive knock-on effect on lakes, estuaries and ground-waters in the region.

Carlow County Council has prioritised farm inspections (based on risk tools developed by the River Basin District office) for the Burren Lower. This catchment contains priority polluted sites on the Aghalona and Burren listed below. Review of two section 4 licences, discharging to the Aghalona are being finalised at present, and septic tank inspections may also be prioritised in this catchment, as a result of EPA risk mapping. They have also carried out monitoring of the feeder streams which discharge to this area in order to identify priority sub-catchments. It is hoped this work will be reflected in improved ecology at these sites in future. Works to connect Kernanstown Sewerage Scheme to the Carlow network are now completed and should improve conditions at station 0485 on the Burren, and Fenagh WWTP no longer discharges to the Burren tributary, but is piped to the Burren immediately south of Ullard Bridge.

**Table 2: WFD Priority Polluted River Sites in Carlow**

River	Code	Location	Q Value	Year	Category	Suspected Cause	Comment
<b>AGHALONA</b>	14A02-0100	Friarstown Br	3-4	2011	Agriculture		High ortho-Phosphate and TON
<b>AGHALONA</b>	14A02-0200	Br nr Moatalusha House	3-4	2011	Agriculture	Agricultural : Diffuse	Lot of improved pasture & tillage u/s
					Municipal		Lot of houses scattered u/s - onsite wastewater systems??
<b>BLACKLION STREAM</b>	12B04-0400	Br u/s Derreen R Conf	3-4	2010	Agriculture		High ortho-phosphate in 2012
<b>BURREN</b>	14B05-0100	Ullard Br	3-4	2011	Municipal	Sewage	Fenagh WWTP located on u/s trib.
					Agriculture	Agricultural : Diffuse	Tillage & improved pasture

<b>BURREN</b>	14B05-0400	Staplestown Br	3-4	2011	Agriculture	Intensive Land use	Tillage & Improved pasture
					Municipal	Sewage	Rathoe WWTP located u/s
					Industrial	Quarrying	River runs alongside it u/s. Section 4 discharge licence
<b>BURREN</b>	14B05-0485	Ring Rd Br Carlow (d/s side)	3-4	2011	Municipal	Sewage	Kernanstown WWTP now connected to the Carlow town network Lot of new houses around Carlow town
					Agriculture	Agricultural : Diffuse	Intensive land use - improved pasture & tillage
<b>DEREEN</b>	12D01-0700	Rathglass Bridge	3-4	2010	Agriculture	Agricultural : Diffuse	Q4-5 in 2007
<b>DOUGLAS (BALLON)</b>	12D03-0200	Sragh Br	3-4	2010	Agriculture		Q4 in 2007
<b>DOUGLAS (BALLON)</b>	12D03-0400	Bang Up Br	3-4	2010	Municipal	Sewage	Located d/s of Stn 0160 and Ballon
					Agriculture	Agricultural : Diffuse	
<b>OLD LEIGHLIN STREAM</b>	14O02-0700	Madlin Br	3-4	2011	Agriculture	Agricultural : Diffuse	Abundant plant & algal growths and elevated DO
					Municipal	Sewage	Old Leighlin WWTP located u/s
<b>LERR</b>	14L01-0300	Lerr Br	3-4	2011	Agriculture	Agricultural : Diffuse	Lot of tillage & improved pasture
					Municipal	Sewage	Palatine str confluence u/s - Palatine WWTP located u/s

## 4. 2012 Summary of River Water Quality in Co. Carlow

These assessments are based on physico-chemical measurements made during 2012, and the most recent Q values and assessments of the river biologists.

River	Remarks	Change from 2011
<b>Blacklion Stream</b> <b>12B04-0400 Q3-4 (2010)</b>	This stream was first sampled in 2007 under WFD. As with previous years, nitrates were elevated during 2012, and abundant weed growth was recorded. Biological monitoring in 2010 indicated only moderate quality at this location (though good quality further upstream).	No change.
<b>Clody</b> <b>12C03-0100 Q4 (2007)</b> <b>12C03-0200 Q4-5 (2010)</b>	Chemical monitoring data satisfactory during 2012. Biological monitoring in 2010 also indicates high quality as far as Bunclody (stn 0200) and good quality further downstream. Increased housing density in the catchment may be having an adverse effect on water quality.	No change from 2011.
<b>Clonmore Stream</b> <b>12C05-0100</b>	This river is a tributary of the Derreen river and flows through agricultural land in NE Carlow. Water can be coloured, but chemical monitoring data is generally satisfactory.	No change from 2011.
<b>Derreen</b> <b>12D01-0200 Q3-4 (2007)</b> <b>12D01-0300 Q4 (2010)</b> <b>12D01-0400 Q4 (2010)</b> <b>12D01-0550 Q3-4 (2010)</b> <b>12D01-0700 Q3-4 (2010)</b>	This report deals with the Carlow stretch of the Derreen only (u/s stretches are in Co. Wicklow). The Derreen sub-catchment is protected under the Freshwater Pearl Mussel Regulations (SI 296 of 2009). Colour in this river is high (naturally occurring). Nitrate levels have been reducing slightly over the last three years. Q values indicate an improvement d/s Hacketstown WWTP, and deterioration in the lower reaches.	The recent downward trend in nitrate concentrations continues, otherwise no change from 2011.
<b>Derry</b> <b>12D02-0900 Q4 (2007)</b>	This report only deals with the Carlow /Wexford stretch of the river, where biological conditions were good in 2007, however average BOD is slightly higher than in 2011.	BOD slightly elevated compared with 2011 levels.

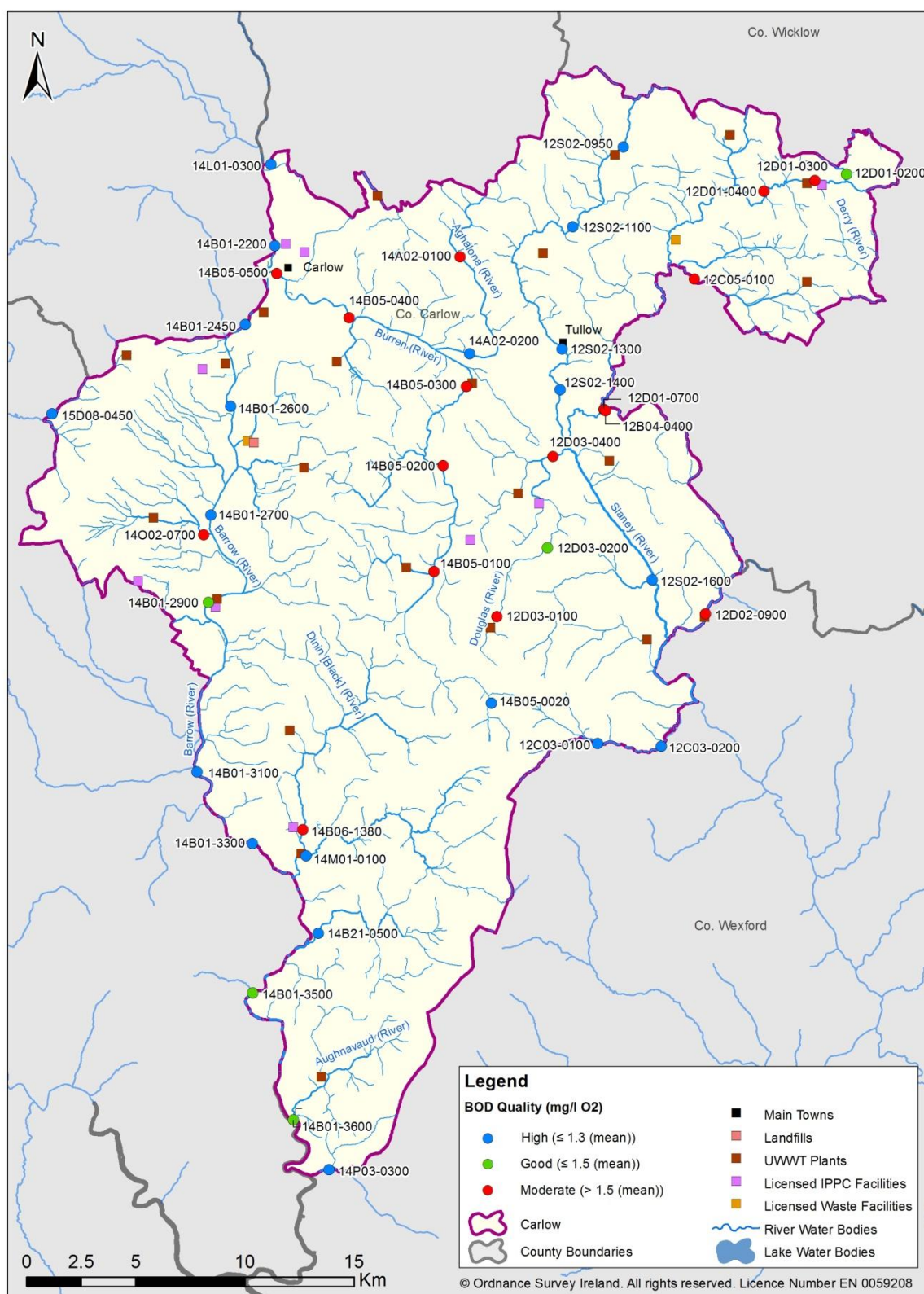
<b>Douglas (Ballon)</b> <b>12D03-0100 Q4 (2010)</b> <b>12D03-0200 Q3-4 (2010)</b> <b>12D03-0400 Q3-4 (2010)</b>	<p>This river flows through agricultural land and past the villages of Myshall and Ballon in Co. Carlow.</p> <p>BOD and ortho-phosphate were high in October at all stations, and at station 0200 in November.</p> <p>Colour and nitrate were also elevated during 2012.</p> <p>Biological monitoring also indicates over-enrichment, and quality is moderate at all but the upstream station.</p>	No change from 2011.
<b>Douglas (Kiltegan)</b> <b>12D04-0700 Q3-4 (2010)</b>	<p>A tributary of the Derren and Slaney, this river was included in the sampling programme under WFD.</p>	No change from 2011.
<b>Slaney</b> <b>12S02-0950 -</b> <b>12S02-1100 Q4 (2010)</b> <b>12S02-1300 Q4 (2010)</b> <b>12S02-1400 Q3-4 (2010)</b> <b>12S02-1600 Q4 (2010)</b>	<p>The Slaney rises in the Wicklow mountains and flows through Carlow and Wexford, before flowing into the sea at Wexford Harbour. This table deals with the freshwater stretches that flow through Carlow. BOD, ortho-phosphate and ammonia have reduced compared with 2011 levels d/s Tullow STW (stn 1400), otherwise quality is satisfactory.</p>	Improved chemistry at station 1400, otherwise no significant change from 2011.
<b>Aghalona</b> <b>14A02-0100 Q3-4 (2011)</b> <b>14A02-0200 Q3-4 (2011)</b>	<p>This river flows through a major tillage area, which explains the high nitrate levels seen once again in 2012. BOD and ortho-phosphate were also high in October. Biological assessment of Q3-4 in 2011 underlines the unsatisfactory moderate conditions.</p>	No change observed.
<b>Aughavaud</b> <b>14A04-0580 Q 4-5 (2011)</b>	<p>This river was added to the sampling programme in 2009 when the sub-catchment was designated a protected habitat under the Freshwater Pearl Mussel Regulations (SI 296 of 2009). BOD was elevated in October, otherwise chemical and biological monitoring indicates satisfactory conditions.</p>	No change observed.
<b>Barrow</b> <b>14B01-2200 Q3-4 (2011)</b> <b>14B01-2450 -</b> <b>14B01-2600 Q3-4 (2011)</b> <b>14B01-2700 Q3-4 (2011)</b> <b>14B01-2900 Q4 (2011)</b> <b>14B01-3100 Q3-4 (2011)</b> <b>14B01-3300 Q3-4 (2011)</b> <b>14B01-3500 Q4 (2011)</b> <b>14B01-3600 -</b>	<p>The Barrow rises in the Slieve Bloom mountains and flows through counties Laois, Kildare, Carlow, Kilkenny and Wexford. It converges with the Nore and Suir rivers before discharging to Waterford Harbour. The lowest reaches are tidal and they are dealt with under the Transitional Waters monitoring programme. BOD and o-phosphate were slightly raised in June at Goresbridge, and BOD was slightly raised at Ballyteiglea Bridge on the same date. Biological monitoring indicates only moderate conditions at five of the seven stations monitored in Carlow.</p>	No significant change from 2011.

<b>Burren</b> <b>14B05-0020 Q4-5 (2011)</b> <b>14B05-0100 Q3-4 (2011)</b> <b>14B05-0200 Q3-4 (2011)</b> <b>14B05-0300 Q4 (2011)</b> <b>14B05-0400 Q3-4 (2011)</b> <b>14B05-0500 -</b>	This river flows through a tillage area in north Co. Carlow hence the elevated nitrate levels in the lower reaches. Nitrates are high in the lower reaches of this river. ortho-Phosphate levels were high at station 0200, 0300 and 0400 in October. Biological monitoring reflects the moderate conditions at most of the stations surveyed.	No significant change from 2011.
<b>Black (Borris)</b> <b>14B06-1380 Q4-5 (2011)</b>	BOD was high on two occasions in 2012, otherwise chemistry was satisfactory, and biological monitoring indicates high ecological conditions.	No significant change from 2011.
<b>Ballymurphy (Barrow)</b> <b>14B21-0500 Q4 (2011)</b>	This river was added to the sampling programme in 2009 when the sub-catchment was designated a protected habitat under the Freshwater Pearl Mussel Regulations (SI 296 of 2009).	No change from 2011.
<b>Lerr</b> <b>14L01-0300 Q3-4 (2011)</b>	This river flows through areas of intensive tillage farming in Co. Kildare. Only station 0300 (u/s of Barrow) in monitored here. High nitrate levels are characteristic of this river and quality is only moderate with biological assessments indicating eutrophication and excessive siltation.	No change from 2011.
<b>Mountain</b> <b>14M01-0100 Q4-5 at station 0070 (2011)</b> <b>14M01-0200 Q4 (2009)</b>	The Mountain sub-catchment was designated a protected habitat under the Freshwater Pearl Mussel Regulations (SI 296 of 2009). BOD was high at station 0200 (d/s of Borris WWTP) in October (may be weather related).	No significant change from 2011.
<b>Old Leighlin Stream</b> <b>14O02-0700 Q3-4 (2011)</b>	A tributary of the Barrow, this river flows through an agricultural area. It was added to the work programme in 2007 under WFD. The slight improvement in chemical quality noted in 2011 is reversed in 2012 with high BOD, colour and ortho-phosphate measured in June and October. Biological assessments indicate eutrophic conditions.	Chemistry indicates slight deterioration during 2012.
<b>Pollmounty</b> <b>14P03-0300 Q4 (2011)</b>	Chemistry is satisfactory at station 0300 (below confluence with Aughanagh River and d/s of a fish farm), and the biological assessment indicates good quality here, despite ongoing signs of enrichment.	No significant change from 2011.

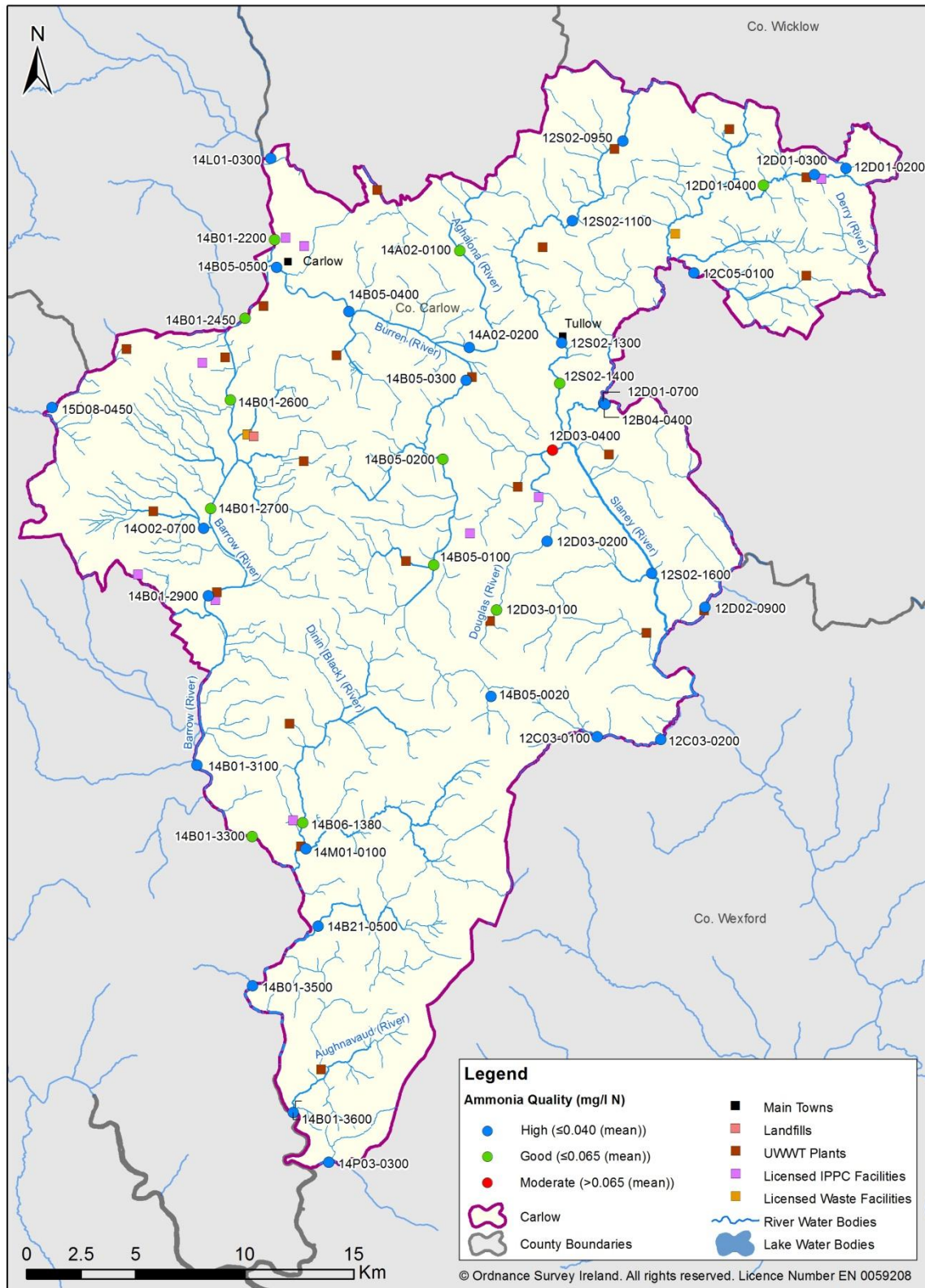


<b>Dinin</b> <b>15D02-0450</b> <b>Q4-5 (2010)</b>	This sampling point is located on the southern branch of the Dinin. The river can be highly coloured at times, otherwise chemistry is good, and biological monitoring indicated high quality.	No change from 2011.
--	---	----------------------

# River Water Quality: Carlow BOD Assessment 2012

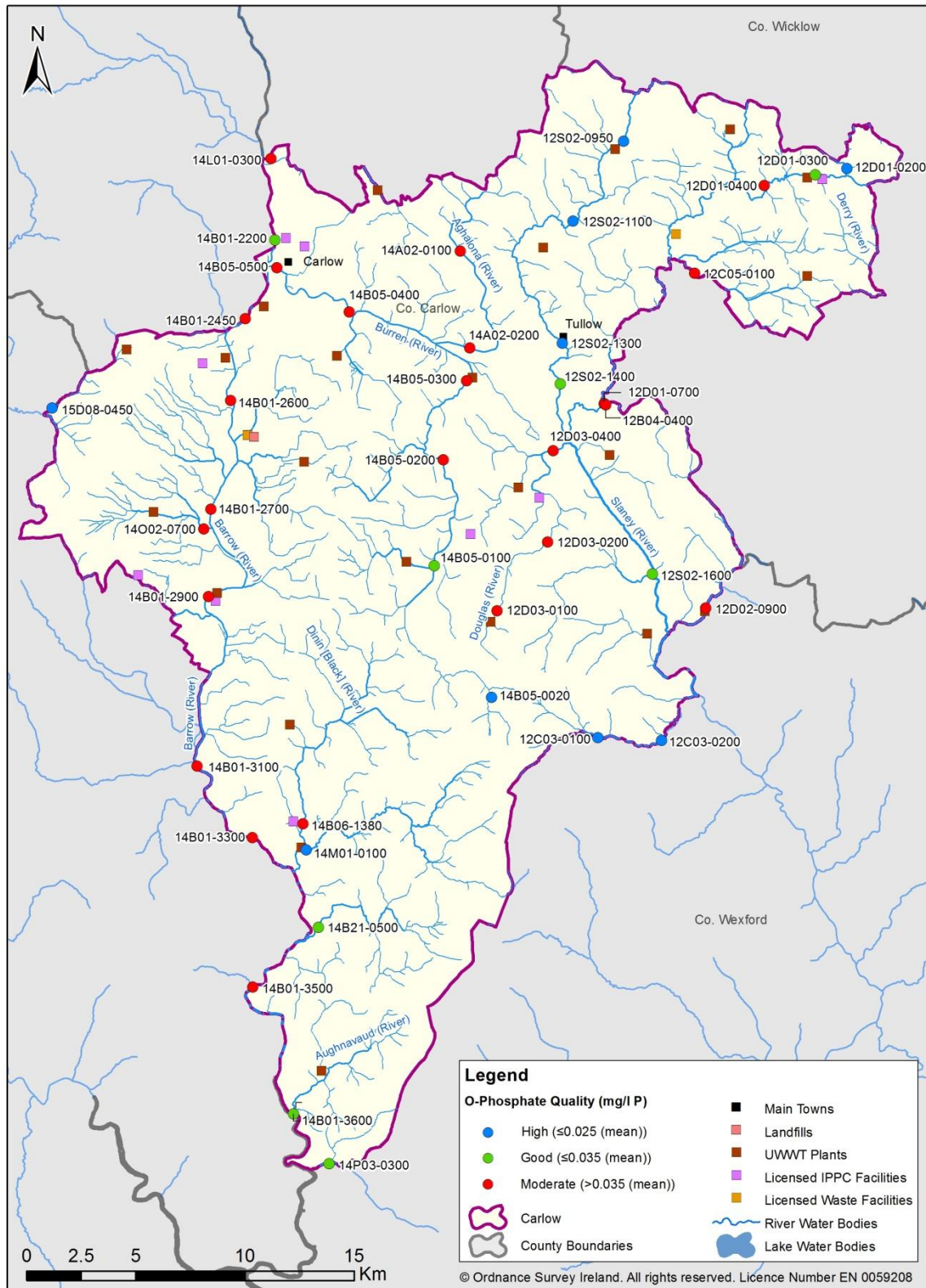


# River Water Quality: Carlow Ammonia Assessment 2012





# River Water Quality: Carlow O-Phosphate Assessment 2012



# River Water Quality: Carlow Total Oxidised Nitrogen Assessment 2012

