

Report on River Water Quality in County Kilkenny

2012

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1. Overview

This report gives an assessment of river water quality in County Kilkenny 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 Arrigle, Castlecomer Stream, Clough, Dinin, Muckalee, Munster, Nore, Owveg, Pollanassa and Powerstown Stream. However the Brownstown Stream, Bregagh, Glory, Goul, Gowran, Kings, Monefelim and Nuenna 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 Kilkenny rivers with no sites failing chemistry in 2012, 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, o-phosphate and TON, details of which are available at 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 Kilkenny Rivers 2006-2012

Year	No of Stations	Pass	Of Concern	Fail
2006	95	21	74	0
2007	75	11	63	1
2008	76	22	54	0
2009	75	25	50	0
2010	75	32	43	0
2011	75	39	35	1
2012	75	45	30	0

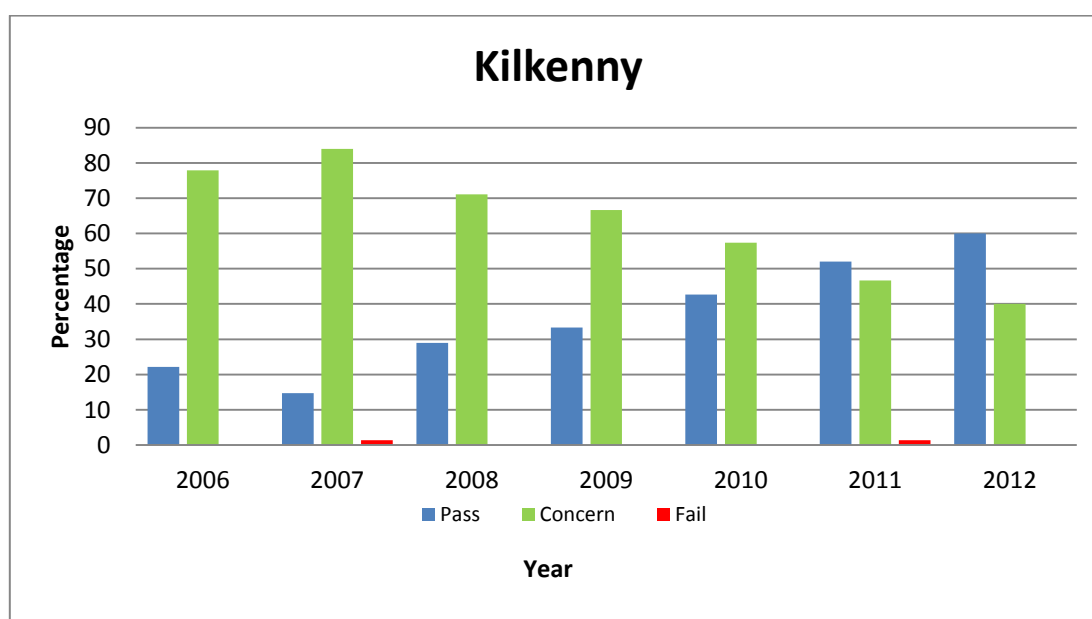


Figure 1: Trend in Chemical Quality in Kilkenny Rivers 2006-2012

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 Kilkenny 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.

Kilkenny County Council plans to carry out a desk-study, followed by farm inspections and small stream risk score surveys on the Goul, Monefelim and Gowran. They are working also with the agri-industrial facility adjacent to station 0400 on the Gowran to improve water quality there (probably by installing a constructed wetland in 2012). Investigations are also planned for the Kings River and Nuenna to identify possible sources of sewage discharging to these rivers. It is hoped this work will be reflected in improved ecology at these sites in future. Upgrades on several Waste Water Treatment Plants, including Kilkenny City, have started which should improve conditions further on the Nore. Investigative monitoring commissioned by Kilkenny County Council on the Gowran, Blackwater (Kilmacow) and Nore upstream and downstream of the respective waste water treatment plants indicates good or high ecological quality at all stations.

Table 2: WFD Priority Polluted River Sites in Kilkenny

River	Code	Location	Q Value	Year	Category	Suspected Cause	Comments
BROWNSTOWN STREAM	15B04-1100	Br u/s Nore conf	3-4*	2010	Agriculture & Urban		Siltation recorded in 2010
BREGAGH (KILKENNY)	15B02-0350	Brewery Br, Kilkenny	3	2010	Urban	CSOs- Storm Overflows	
					Urban	Restoration/ enhancement works	Wire mesh covering substratum
GLORY	15G01-0045	0.1km d/s Br N of Kilmaganny	2-3	2010	Agriculture		High ammonia & ortho-phosphate
GOUL	15G02-0300	Fertagh Bridge	3-4	2010	Industrial	Mining	Galmoy mine ceased production in 2012.
					Agriculture	Agricultural: Diffuse	
GOWRAN	14G03-0100	Br on side of Gowran	3-4	2011	Agriculture		High BOD & ortho-phosphate

GOWRAN	14G03-0400	Br at Red Mill (N Channel)	2-3	2011	Industrial	Industrial	Agri-Industrial facility with seasonal pollution problems.
					Agriculture	Intensive Land use	
KING'S (KILKENNY)	15K02-0500	Br in Callan	3-4	2010	Urban		High ammonia & ortho-phosphate
KING'S (KILKENNY)	15K02-0800	Kells Br	3-4	2010	Urban		
KING'S (KILKENNY)	15K02-0900	Ennisnag Br	3-4	2010	Municipal	Sewage	Stonyford sewage comes in u/s via stream
MONEFELIM	14M03-1000	Br u/s Barrow R confl (u/s side)	3-4	2011	Agriculture	Agricultural: Diffuse	Enriched, elevated DO, heavy silt & excessive algal growths.
NORE	15N01-2000	NE of Warrington, d/s Kilkenny	4*	2010	Municipal	Large Municipal WWTP	Siltation
NORE	15N01-2320	1 km d/s Thomastown Br	3	2010	Municipal	Large Municipal WWTP	Quality has improved at station 2305 (LHS of Thomastown Br.) since 2007, but the improvement is not seen at this location.
NUENNA	15N02-0100	Br d/s Clomantagh	3-4	2010	Agriculture		High TON
NUENNA	15N02-0300	1km d/s Freshford	3-4	2010	Municipal	Sewage	

4. 2012 Summary of River Water Quality in Co. Kilkenny

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
Barrow 14B01-3100 Q3-4 (2011) 14B01-3300 Q3-4 (2011) 14B01-3500 Q4 (2011) 14B01-3600	<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 ortho-phosphate were slightly raised on one occasion at Goresbridge (Stn 3100), and BOD was raised at Ballyteigelea Br (Stn 3300) on the same date. Biological monitoring indicates moderate conditions at these locations also.</p>	No significant change from 2011.
Gowran 14G03-0100 Q3-4 (2011) 14G03-0300 Q4 (2011) 14G03-0400 Q2-3 (2011)	<p>The Gowran is divided into two channels by a weir at station 0200, and stations 0300 and 0400 are on separate channels. High BOD and ortho-phosphate were recorded at station 0100 in October. Nitrates are moderate throughout the river. Biological monitoring indicates improved conditions north of Goresbridge in recent years, but conditions remain poor at Red Mill bridge. Investigative monitoring commissioned by Kilkenny County Council on the Gowran upstream and downstream of the waste water treatment plant indicates good ecological quality at both stations.</p>	No change from 2011.
Monefelim 14M03-1000 Q3-4 (2011)	<p>A tributary of the Barrow, this river flows through an agricultural area. It was added to the work programme in 2007 under WFD. Chemistry is satisfactory, but biological assessments in 2011 indicate the deterioration to moderate quality at station 1000 remains. Siltation remains a problem in the upper reaches.</p>	No significant change from 2011.

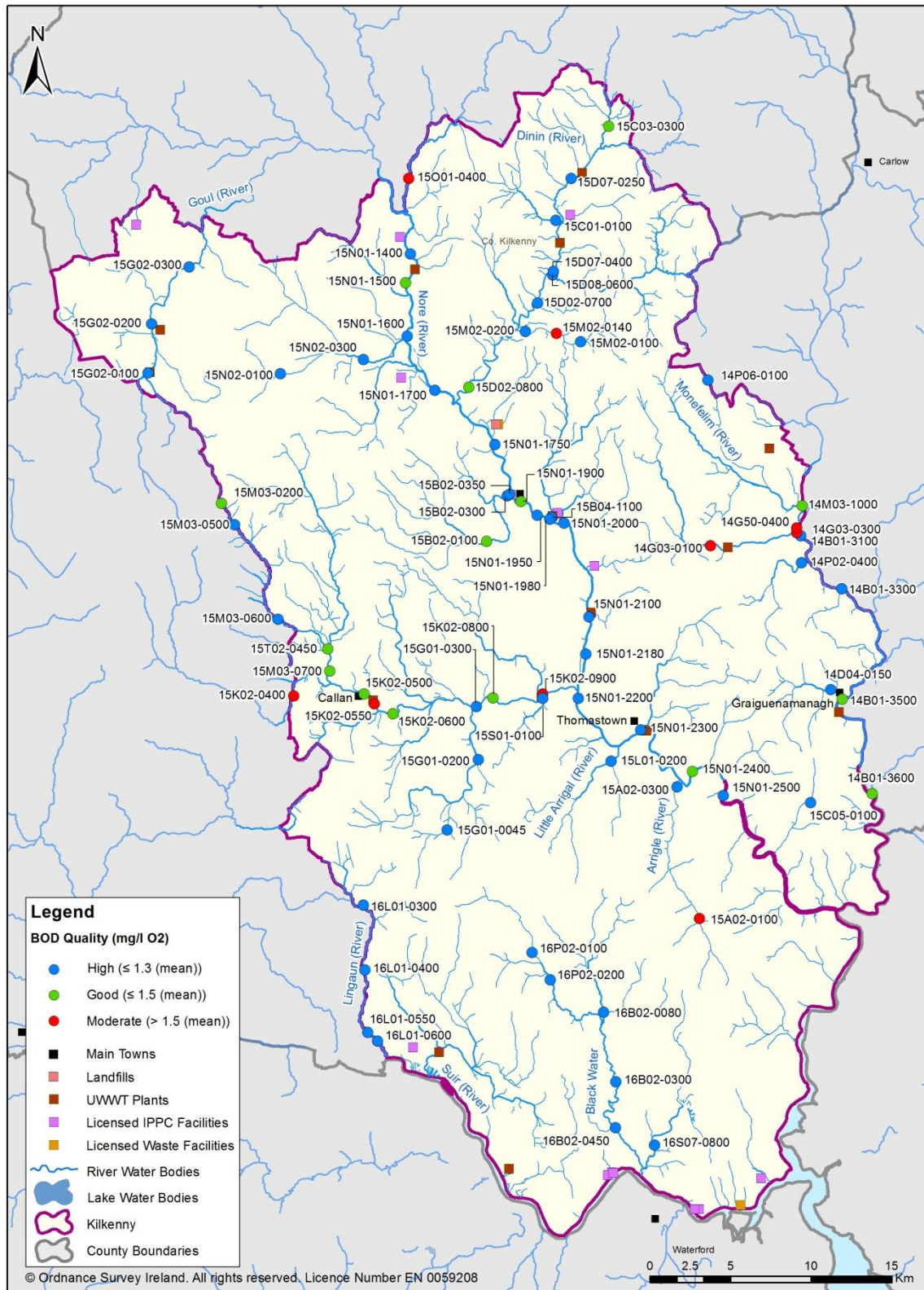
Powerstown Stream (Kilkenny) 14P02-0400 Q4 (2011)	This river joins the Barrow at south of Goresbridge, it was added to the work programme in 2007 under WFD. It should not be confused with the Powerstown stream that flows beside the Powerstown landfill in Co. Carlow. Satisfactory chemistry, however biological assessments noted excessive siltation and compaction of the river bed.	No change from 2011.
Arrigle 15A02-0100 Q4 (2010) 15A02-0300 Q4-5 (2010)	High BOD (9.0 mg/l O ₂) recorded in July at station 0100, otherwise quality is satisfactory.	No change from 2011.
Bregagh (Kilkenny) 15B02-0100 15B02-0300 15B02-0350 Q3 (2010)	This tributary of the Nore flows through agricultural land and then Kilkenny City. The river can be dry at times in the summer. ortho-Phosphate was high in October (after heavy rain), and biological assessment indicates moderate quality at station 0350 (Brewery Bridge)	No change from 2011.
Brownstown (Pococke) 15B04-1100 Q3-4*(2010)	A tributary of the Nore, south of Kilkenny, this river is subject to intermittent discharges from agriculture and from the IDA industrial estate at Purcellsinch, Kilkenny. High BOD and ortho-phosphate in October (after heavy rain), and biological monitoring indicated moderate conditions with some siltation.	No significant change from 2011.
Castlecomer Stream 15C01-0100 Q 4 (2010)	Colour can be high at times, otherwise chemical quality is satisfactory.	No change from 2011.
Clough 15C03-0300 Q 4 (2010)	DO is high at times, but biological monitoring in 2010 indicated good ecological conditions.	No significant change from 2011.
Dinin 15D02-0250 15D02-0400 Q4 (2010) 15D02-0600 Q4 (2010) 15D02-0700 Q4 (2010) 15D02-0800 Q4 (2010)	There are two branches (north and south) that come together into a main channel for the final two sampling points. Wide variation in DO (46% to 131% satn) noted during the year at station 0250 (d/s Massford WWTP). This river can also be highly coloured at times.	No significant change from 2011.
Glory 15G01-0045 Q2-3 (2010) 15G01-0200 Q4 (2010) 15G01-0300 Q4 (2010)	This river flows through agricultural land and the villages of Windgap, Kilmaganny and Dunamaggin in Co. Kilkenny. On-going poor ecological quality at station 0045 (d/s Kilmaganny) as a result of sewage discharges.	No change from 2011.

Goul 15G02-0100 15G02-0200 15G02-0300 Q3-4 (2010)	<p>The Goul is a tributary of the Erkina and flows past Johnstown and Urlingford in Co. Kilkenny, before flowing into Co. Laois. It receives effluent from the lead and Zinc mine at Galmoy. The high nutrients noticed in 2011 were not apparent in 2012. Biological monitoring indicates moderate quality at all stations except station 0500 where quality is good. Production at the mine ceased in late 2012.</p>	<p>Chemistry has improved since 2011.</p>
Kings River 15K02-0400 15K02-0500 Q3-4 (2010) 15K02-0550 15K02-0600 Q4 (2010) 15K02-0800 Q3-4 (2010) 15K02-0900 Q3-4 (2010)	<p>This river flows through Co. Tipperary and Co. Kilkenny, before it joins the Nore d/s of Bennettsbridge. It flows through Callan and Kells in Co. Kilkenny. BOD and ammonia were elevated from station 0200 (d/s Ballingarry STW) to station 0600 (d/s Callan) in May. ortho-Phosphate can also be elevated at times. Biological monitoring also indicates only moderate quality over much of the river's course.</p>	<p>No significant change from 2011.</p>
Little Arrigle 15L01-0200	<p>As in previous years, high BOD, ammonia and nitrite on occasion at Goat's Bridge indicate intermittent pollution.</p>	<p>No change from 2011.</p>
Muckalee 15M02-0100 Q4-5 (2010) 15M02-0140 15M02-0200 Q4 (2010)	<p>This river provides raw water for Kilkenny City's drinking water supply at station 0140. Colour is naturally high, and BOD was high at station 0140 in August, otherwise quality is satisfactory. ortho-Phosphate reduced slightly at station 0200 during 2012.</p>	<p>No significant change from 2011.</p>
Munster 15M03-0200 15M03-0450 Q4 (2010) 15M03-0500 Q4 (2010) 15M03-0600 Q4 (2010) 15M03-0700 Q4 (2010)	<p>There are two branches to this river – the east branch (formerly known as the Tullaroan Stream) and the main branch. The final station is below the confluence of the two branches. Low flows can be observed in the upper reaches at times. BOD was high in the river in May, and in contrast to 2011, no station was dry when visited in 2012. Biological monitoring indicates satisfactory quality.</p>	<p>No significant change from 2011.</p>

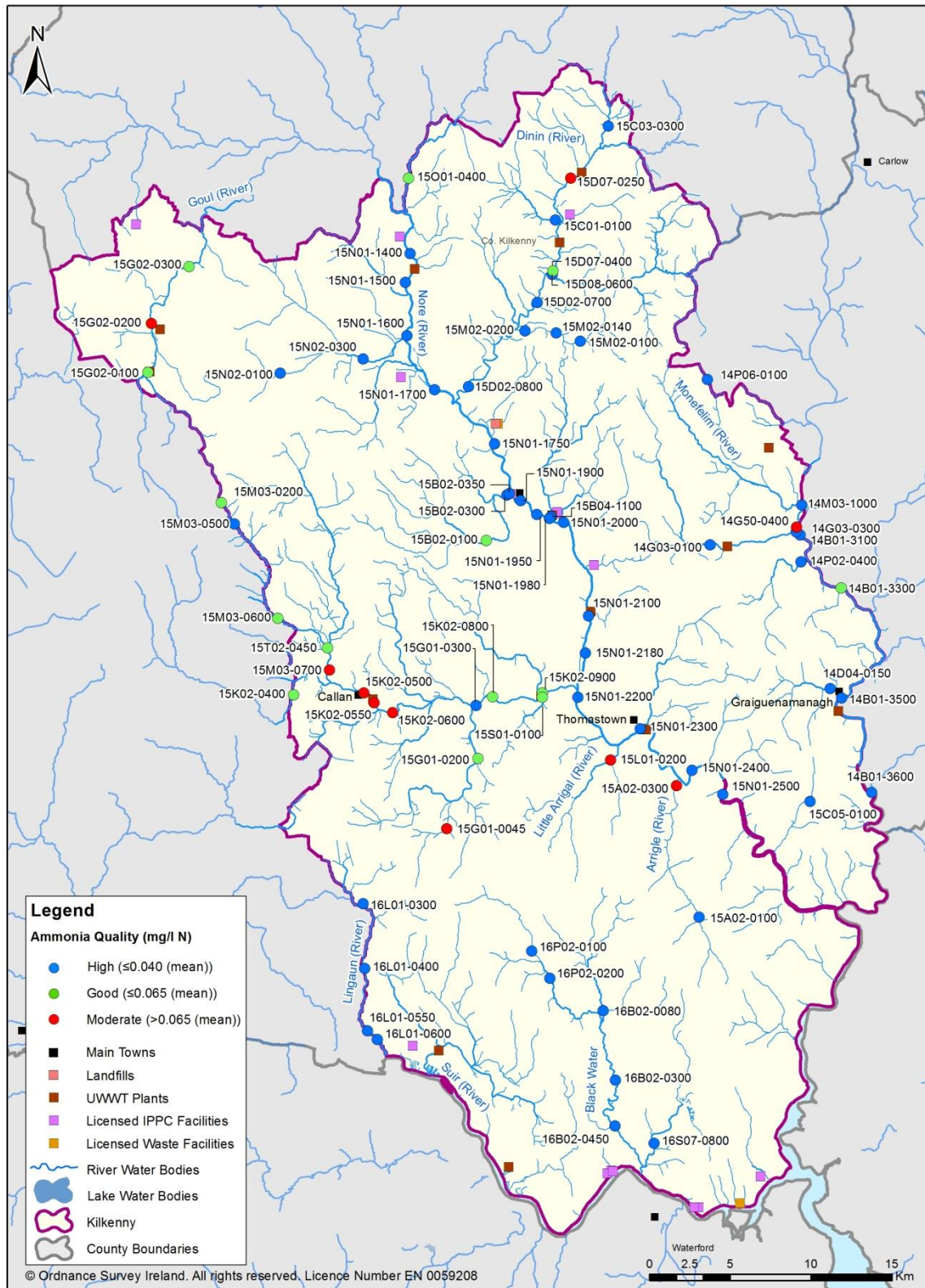
Nore 15N01-1400 15N01-1500 15N01-1600 15N01-1700 Q4 (2010) 15N01-1750 15N01-1900 15N01-1950 Q4 (2010) 15N01-1980 15N01-2000 Q4* (2010) 15N01-2100 15N01-2180 15N01-2200 Q4 (2010) 15N01-2300 Q4 (2010) 15N01-2400 Q4 (2010) 15N01-2500	<p>This river is 141 km in length and has a catchment area of 2530 km². It flows through counties Tipperary, Laois and Kilkenny, before joining the River Barrow at New Ross. The Nore is a Designated Salmonid River under the Freshwater Fish Directive (78/659/EEC). It flows through mainly agricultural land, and passes through, or close to Borris-in Ossory, Mountrath, Abbeylax, Durrow, Ballyragget, Kilkenny, Bennettsbridge and Thomastown. The river can be coloured at times, and ortho-phosphate and nitrate were high at station 1980 (u/s Kilkenny WWTP) in March. BOD and ortho-phosphate levels have been reducing generally in recent years. With the exception of station 2320 (1km d/s Thomastown), where ecological conditions remain poor, overall quality is satisfactory. Investigative monitoring commissioned by Kilkenny County Council on the Nore upstream and downstream of the waste water treatment plant at Thomastown indicates good ecological quality at both stations.</p>	<p>Slight improvement in BOD and ortho-phosphate in recent years. Biological monitoring in 2010 indicates an improvement in ecological quality over most of the river, but it remains moderate at station 2320 d/s Thomastown.</p>
Nuenna 15N02-0100 Q3-4 (2010) 15N02-0300 Q3-4 (2010)	<p>BOD and ammonia were high at station 0100 in May, and nitrates are elevated at both stations. Biological monitoring indicates only moderate conditions.</p>	<p>No change from 2011.</p>
Owveg (or Owenbeg) 15O01-0400 Q4 (2010)	<p>This river rises in Co. Laois and forms part of the Kilkenny/Laois border. BOD and ortho-phosphate were high over the length of the river in October, and BOD at station 0400 was slightly elevated throughout 2012, compared with 2011.</p>	<p>Slight increase in BOD at Attanagh Bridge.</p>
Stoneyford Stream 15S01-0100	<p>A tributary of the Kings, this river flows through Stoneyford village. Elevated ammonia recorded in March, otherwise quality is satisfactory.</p>	<p>No significant change from 2011.</p>

Blackwater (Kilmacow) 16B02-0080 Q4 (2012) 16B02-0300 Q4 (2012) 16B02-0450 Q3-4 (2012)	<p>Slight reduction in ortho-phosphate concentration over the length of the river. Chemistry is satisfactory, but only moderate ecological quality was recorded in October 2012. Investigative monitoring commissioned by Kilkenny County Council on this river upstream and downstream of the Kilmacow waste water treatment plants indicates high ecological quality at both stations. It is hoped these improvements will continue and be observed during the next EPA biological survey of this river.</p>	<p>No significant change from 2011.</p>
Lingaun 16L01-0300 Q4-5 (2011) 16L01-0400 Q4 (2011) 16L01-0550 16L01-0600 Q3-4 (2011)	<p>This river rises in Slievenamon and flows along the Kilkenny/Tipperary border. The water supply for Carrick-on-Suir is abstracted near station 0550. Chemistry is satisfactory, but ecological quality is only moderate at The Three Bridges (station 0600).</p>	<p>No change from 2011.</p>
Pollanassa 16P02-0100 Q4 (2011) 16P02-0200	<p>This river is a tributary of the Blackwater (Kilmacow). Station 0200 is an abstraction point for Mooncoin Regional Water supply. Quality was satisfactory in 2012.</p>	<p>No change from 2011.</p>
Smartscastle Stream 16S07-0800 Q3-4 (2012)	<p>This stream was added to the work programme in 2007 under WFD. It flows through agricultural land in SE Kilkenny. It is a tributary of the Blackwater (Kilmacow). Chemistry is satisfactory, but the deterioration in ecological conditions from good to moderate is disappointing.</p>	<p>Deterioration in ecological conditions to moderate.</p>

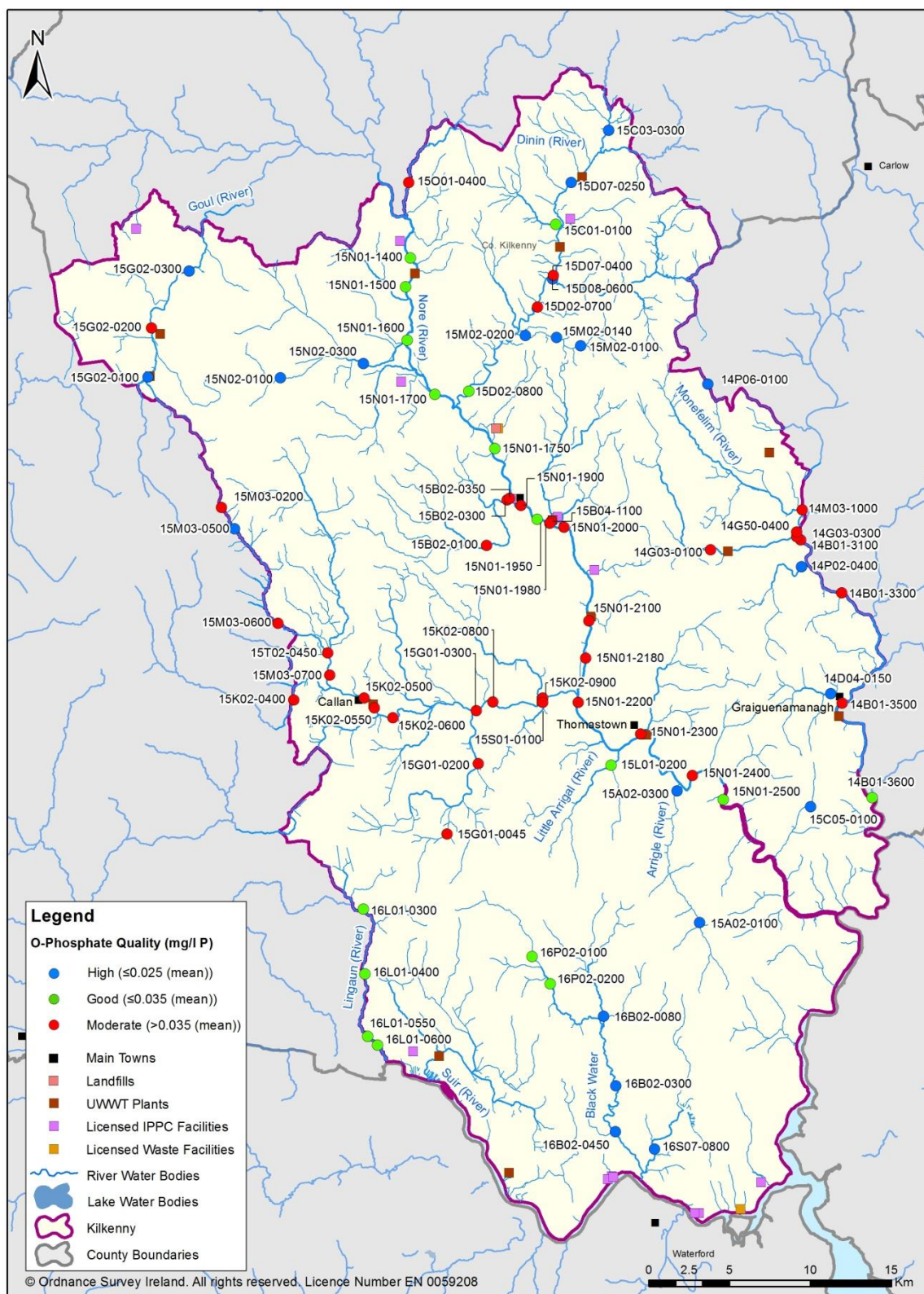
River Water Quality: Kilkenny BOD Assessment 2012



River Water Quality: Kilkenny Ammonia Assessment 2012



River Water Quality: Kilkenny O-Phosphate Assessment 2012



River Water Quality: Kilkenny Total Oxidised Nitrogen Assessment 2012

