Environmental Protection Agency
An Ghníomhaireacht um Chaomhnú Comhshaoil

Summary Report
Water Quality in Ireland

2019-2024

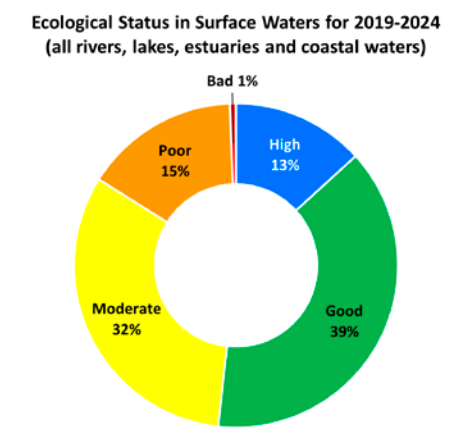
Water Quality in Ireland: A Summary Report

Introduction

This report provides an assessment of the condition of Irelands waters (rivers, lakes, canals, groundwaters, transitional (estuaries) and coastal waters) against the objectives and standards set out in the Water Framework Directive and Ireland's River Basin Management Plan (Water Action Plan 2024)[1].

The assessments are made using data collected from over 4000 surface water bodies and 514 ground water bodies between 2019 and 2024. Comparisons are made between the results from this period and those before to give insight into trends in the condition of our waters over time.

Proportion of all surface water bodies in each ecological status class 2019-2024



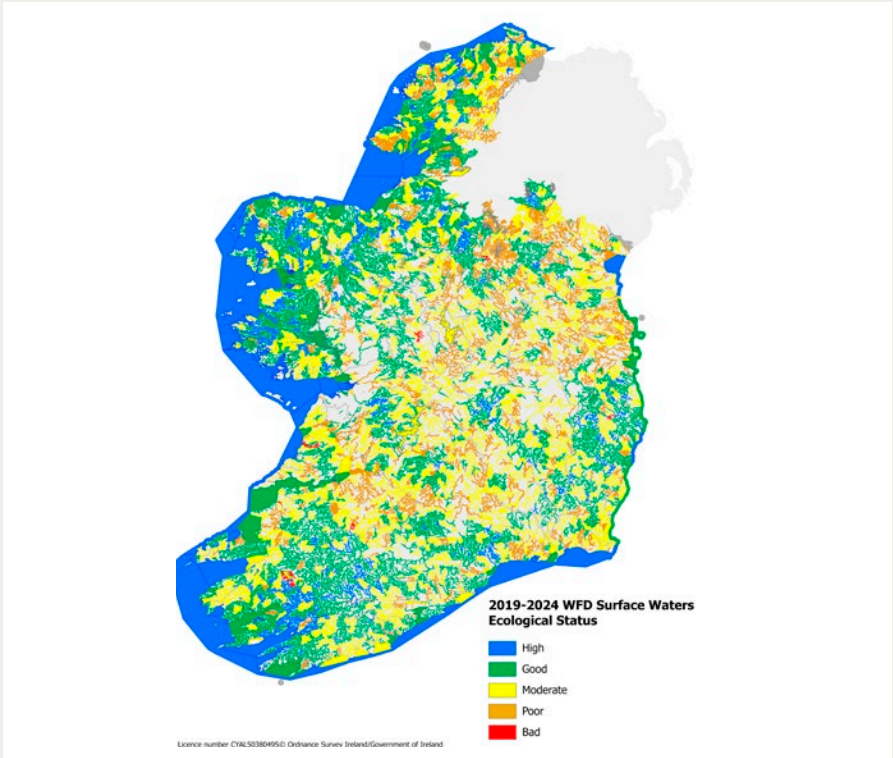
1 https://www.gov.ie/en/department-of-housing-local-government-and-heritage/policy-information/river-basin-management-plan-2022-2027/

How Healthy are our Waters?

Ecological Status

This assessment shows that over half (52%) of our surface waters are in satisfactory ecological health being in either good or high ecological status. This means that 48% of the surface water bodies in Ireland are not as ecologically healthy or resilient as they should be. This is a decline from the previous assessment when 54% were satisfactory.

Surface water ecological status 2019-2024



Coastal waters had the highest percentage of waters in high or good ecological status (82%) followed by lakes (68%), rivers (48%) and transitional waters (30%), which have the worst water quality.

Proportion of surface water bodies across categories in each ecological status class 2019-2024

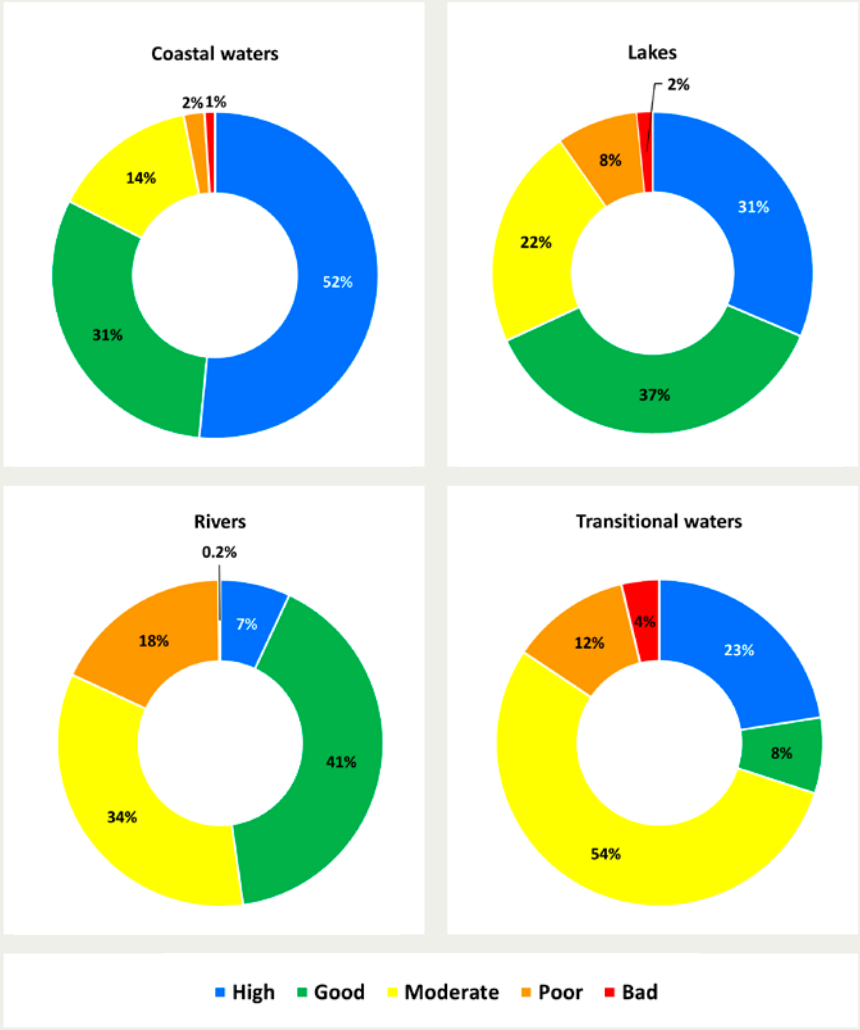


Photo credit: Hugh Feeley

Chemical Status

All surface water bodies failed to achieve good chemical status in 2019-2024 when the assessment included what are known as ubiquitous substances. Ubiquitous substances are found nearly everywhere in the environment and, they persist in the environment for many years after their use has ceased. Many of the failures were due to the presence of Poly Brominated Diphenyl Ethers (PBDEs) and mercury in fish, which were found at concentrations above environmental standards almost everywhere where they were monitored for. These are both ubiquitous substances and their use is restricted. PBDEs are banned in Europe (since 2010), while Ireland is signatory to the Minamata convention that has led to many mercury containing materials being phased out.

When ubiquitous substances (PBDEs and mercury in fish) are excluded, only 18% of surface water bodies fail to achieve good chemical status, indicating 82% are in good chemical status. Mercury in water and other metals in water, pesticides, and per- and poly-fluoroalkyl (PFAS) chemicals in water, are the main causes of non-ubiquitous failures.

The information on chemical status is presented in this way to help identify those water bodies which are being impacted by non-ubiquitous substances likely to have come from local sources. These water bodies may benefit from measures to eradicate these substances from the environment.

Surface water chemical status; including and excluding ubiquitous substances

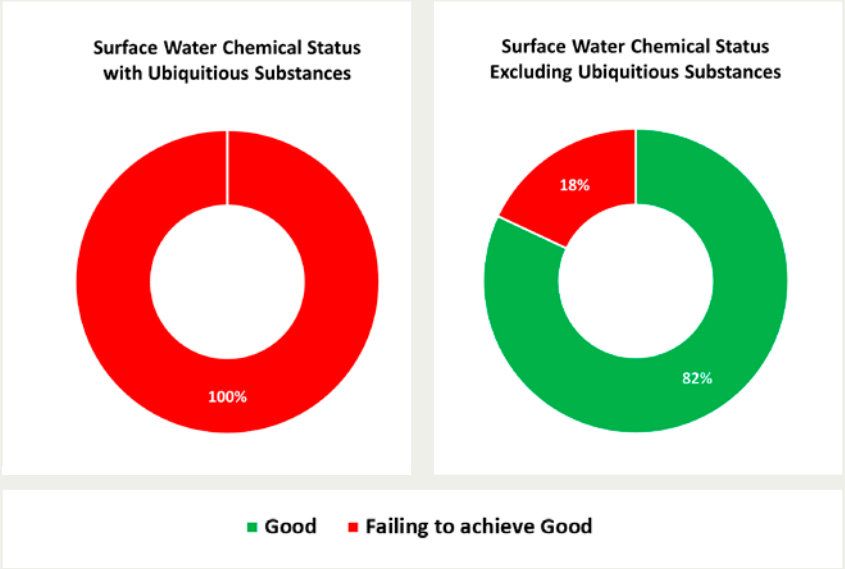
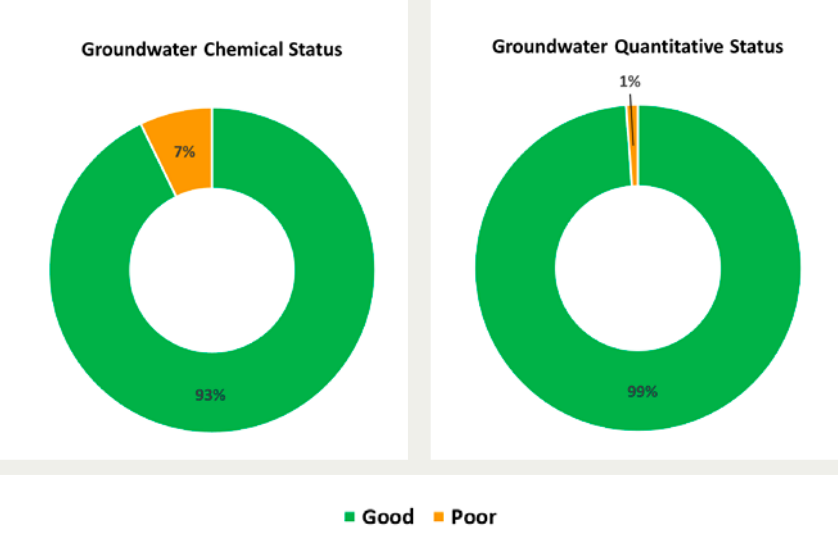



Photo credit: Ruth Little

Groundwater – Chemical and Quantitative status

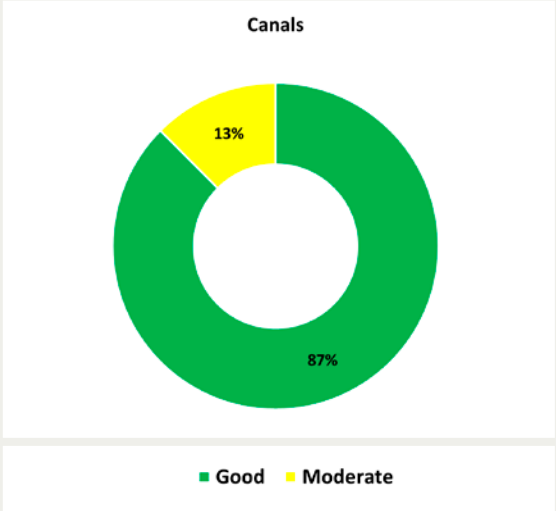
With a few localised exceptions, the quality of groundwater in Ireland is generally good. 93% of groundwater bodies are in good chemical status and 99% are in good quantitative status. Overall, 92% of met both objectives, accounting for 95% of the country (68,012 km^2) by area. Groundwater quality in the country has been stable generally, with nine groundwater bodies improving to good status and eight groundwater bodies declining to poor status.

Chemical and quantitative status of groundwaters



Canals – Ecological Potential

Water quality in the canals is generally relatively good with 87% of canal water bodies achieving good ecological potential in 2019-2024. This is a slight decline since the last assessment (2016-2021) with one fewer water body achieving good ecological potential.

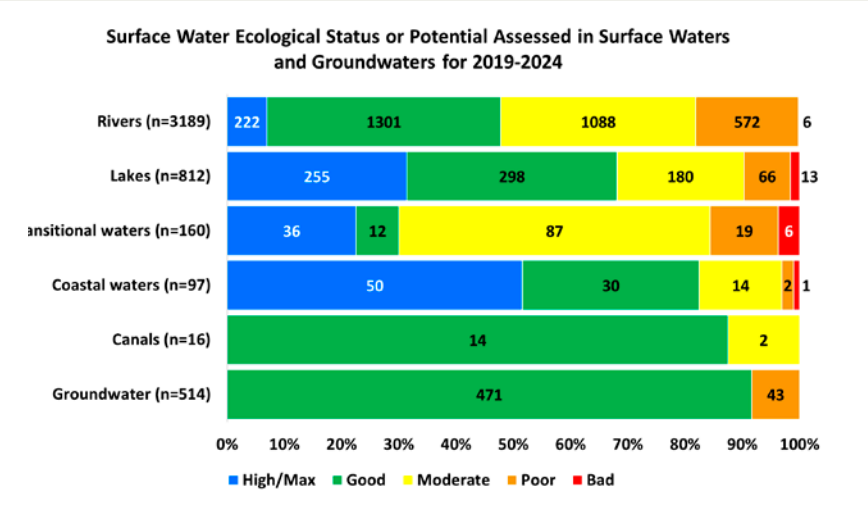


Is Water Quality Improving or Declining?

In the latest assessment, covering the years 2019 to 2024, the number of water bodies in satisfactory condition (high or good status) across rivers, lakes, estuaries and canals declined since the last assessment which covered the period 2016-2021. In contrast, coastal waters and groundwaters improved slightly over the assessment period. Overall, there has been a net decline in our water quality. The slight decline reported in this assessment reflects the ongoing pattern of continuing declines in water quality seen since the first assessment of ecological status was undertaken in the period 2007-2009.

Overall

- 52% of our surface waters are in high or good ecological status and the remaining 48% are in moderate, poor or bad status. This represents a slight decline since the 2016-2021 assessment when 54% of surface waters were in high or good status.
- 100% of surface water bodies failed to achieve good chemical status when failures for ubiquitous substances such as mercury in fish and Poly Brominated Diphenyl Ethers (PBDEs) are included in the assessment. When ubiquitous substances are not included, 82% of surface water bodies are in good chemical status.
- 92% of groundwaters are in good status.



Rivers

- Nationally, 48% of river water bodies are in high or good ecological status and just over 52% are unsatisfactory, moderate, poor or bad ecological status.
- The number of river water bodies in a satisfactory ecological status have declined by 2% since the 2016-2021 period.
- Nitrate concentrations are too high at 44% of rivers sites. These are predominantly located in the east, south east and south of the country. Despite this concentrations of nitrate have reduced at 39% of sites when compared with 2016-2021. In contrast, 6% of river sites showed increasing concentrations, and 55% were unchanged.
- 27% of river sites have high phosphorus concentrations. Since the last assessment in 2016-2021, 16% of sites have increasing concentrations, 2% of sites showed reductions and 77% unchanged.

Lakes

- Nationally, 68% of lake water bodies were in a satisfactory ecological status (high or good) with 32% in unsatisfactory ecological (moderate, poor or bad status) condition.
- There has been a 0.5% decline in the number of lakes in satisfactory ecological status health (high or good) since 2016-2021.
- A third (32%) of lakes have high phosphorus concentrations. Compared with the previous period, 2016-2021, 96% of sites have unchanged phosphorus concentrations, while 3% have increasing concentrations and and 1% have concentrations that are reducing.

Transitional and Coastal Waters

- 30% of transitional water bodies (i.e. estuaries) are in high or good ecological status and 70% are in moderate, poor or bad ecological status.
- 82% of coastal water bodies are in high or good ecological status.
- There has been a 5% decline in transitional waters and a 2.4% improvement in monitored coastal water since 2016-2021.
- 20% of transitional and coastal water bodies have high nitrogen concentrations.
- Loadings of phosphorus and nitrogen to the marine environment have shown reductions in 2024 after a period of increases since 2013. The largest inputs are in the south east of the country and in many areas are still too high.

Chemical Status of Surface Waters

- 100% of surface water bodies failed to achieve good chemical status due to the presence of PBDEs and mercury in fish at concentrations above environmental standards.
- If failures for ubiquitous substance are omitted, then 18% of surface water bodies fail to achieve good chemical status.
- Most of the non-ubiquitous failures were due to mercury in water and other metals, pesticides and per- and poly-fluoroalkyl (PFAS) chemicals in water.

Groundwater

- 92% of groundwater bodies are in good chemical and good quantitative status.
- There has been a slight improvement of 0.2% (1 water body) in the number of groundwater bodies at good status since the last assessment.
- The south east, and midlands and eastern regions of the country have elevated nitrate concentrations,
- with an increase in nitrate concentration most notable in the midlands and eastern region.

Canals

- 14 (87%) of the 16 canal water bodies assessed are in good ecological potential.
- Water quality in the canals has declined slightly since the last assessment in 2016-2021, with one canal water body declining to unsatisfactory ecological potential.

Progress in Priority Areas for Action

- One of the key measures in the second and third river basin management plans was the creation of Priority Areas for Action (PAAs) within which actions are being targeted by the Local Authority Waters Programme (LAWPRO), the Agricultural Sustainability Support and Advice Programme (ASSAP) and other stakeholders to achieve water quality outcomes.
- While ecological status has not yet improved in the PAAs, there is evidence that phosphorus concentrations have improved which is a welcome first step. Ongoing and sustained actions will be needed by all stakeholders to maintain and continue this trajectory of progress. It is important that data on the specific measures being implemented are collated and related to the water quality outcomes to gain insights into the effectiveness of the measures.

Photo credit: Ruth Little

What are the Problems?

The quality of our freshwater and marine ecosystems is being damaged by activities that release pollutants into the water environment and damage the physical integrity of water habitats.

The main causes are:

- Run-off of nutrients, sediment and pesticides from agricultural lands and farmyards;
- Activities such as land drainage, navigational dredging and the presence of barriers such as dams, weirs or culverts in water courses;
- Discharges of poorly treated sewage from urban waste water treatment plants, domestic treatment systems and storm water overflows;
- Run-off from hard surfaces in urban environments of sediment and contaminant loaded water;
- Run-off of nutrients and sediment from forestry operations.

Excess nutrients such as nitrogen and phosphorus entering our waters cause increased growth of plants and algae. When photosynthesis is most active this increases oxygen saturation, but at night the opposite occurs. The oxygen saturation may drop to a level that harms other aquatic life such as insects and fish. Additionally, when excess plant material dies the increased organic material in the water can facilitate bacterial decomposition leading to further drops in oxygen availability.

The concentration of nutrients in many of our waters is too high. 44% of river sites, mostly in the south and southeast of the country, have high nitrate concentrations while over a quarter of river sites (27%) and a third of lakes (32%) have elevated phosphorus concentrations. Phosphorus levels are particularly high in lakes in the northeast of the country.


Photo credit: Ruth Little

Transitional and coastal water bodies are the ultimate receptors of the excess nutrients in our rivers and lakes. The amounts of nitrogen and phosphorus flowing into our estuaries have been too high in recent decades and the ecology of our estuaries, particularly in the south and southeast has declined precipitously as a result. Transitional water bodies are in the poorest condition of any water body type with 70% in unsatisfactory condition which is a 5% decline on the previous assessment.

Many of our water bodies are being damaged by activities that alter their physical shape, flow or form or how they function within their surrounding landscapes. These changes, referred to as hydromorphological alterations, are most common in our river and estuarine water bodies. Physical barriers such as dams, weirs or culverts can block the movement of fish and other wildlife and alter natural sediment transport patterns, while activities such as land drainage and dredging can result in the loss of important habitats. Over 450 surface water bodies are known to be affected by these activities and modifications.

All our surface water bodies are impacted by chemical pollution. This is mostly owing to the presence of ubiquitous substances, such as Poly Brominated Diphenyl Ethers (PBDEs) and mercury in fish, which were found at concentrations above accepted environmental standards. These substances are known as ubiquitous substances because they can be found nearly everywhere in the environment. 18% of our surface waters are impacted by non-ubiquitous substances. These substances include Polycyclic Aromatic Hydrocarbons (PAHs), heavy metals such as mercury, cadmium, nickel and lead in water, pesticides like cypermethrin, and other chemicals such as perfluoro-octanyl sulphonic acid (PFOS) in water.

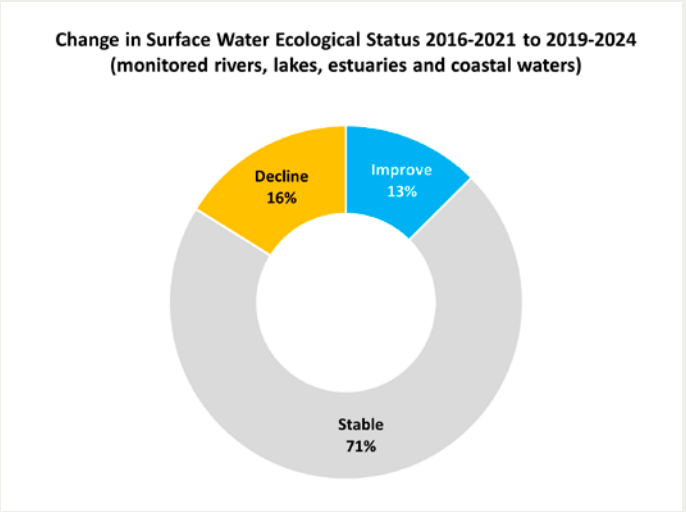
As with our rivers and marine environment, nitrate concentrations are too high at many of our groundwaters, especially in the south east region and midlands and eastern region of the country. Historical contamination from point sources, including mines, landfills and industry, are driving failures in chemical status in 29 groundwater bodies, while abstraction pressures at 7 groundwater bodies are responsible for quantitative status failures.

Photo credit: Ruth Little


Photo credit: Hugh Feeley

While our waters are being impacted by numerous human activities it is important to point out that water quality is improving in some places. However, in many cases these improvements are not sufficient to bring a water body into satisfactory condition and the number of water bodies improving in status is exceeded by the number of water bodies declining. The result being that any improvements in water quality are being offset by declines occurring elsewhere.

Change in ecological status of monitored surface waters from 2016-2021 to 2019-2024



What Needs to be Done?

Water quality continues to be under pressure from various human activities. This is particularly evident in our estuaries which are in the worst condition overall, and have seen the largest proportional decline in quality since the previous assessment.

The evidence presented in this report shows that the goal of restoring all waters to good status by 2027 is not going to be achieved. There are many actions underway to improve water quality. However, the improvements we are seeing in some places, across all sectors, are being cancelled out by declines elsewhere. In order to achieve ecological improvements nationally, the scale and pace of implementation needs to be increased. Ireland needs to take significant actions which include the following:

- Coordinated implementation and tracking of River Basin Management Plan actions, through Sectoral and Catchment Management Plans.
- Improved data sharing and integration between implementing bodies, water quality programmes and state agencies.
- Targeted measures to address the pressures and issues, specific to each waterbody.
- Measure effectiveness needs be quantified, communicated and shared.
- The Nitrates Action Programme must deliver reductions in nutrient losses to our waters.
- Accelerated and sustained investment is needed by Uisce Éireann.
- A regulatory framework for the protection of waters from hydromorphological pressures is urgently needed.

Photo credit: Ruth Little

Headquarters

PO Box 3000
Johnstown Castle Estate
County Wexford, Ireland

T: +353 53 916 0600
F: +353 53 916 0699
E: info@epa.ie
W: www.epa.ie
LoCall: 0818 33 55 99

Regional Inspectorate

McCumiskey House
Richview, Clonskeagh Road
Dublin 14, Ireland
T: +353 1 268 0100
F: +353 1 268 0199

Regional Inspectorate

Inniscarra, County Cork
Ireland
T: +353 21 487 5540
F: +353 21 487 5545

Regional Inspectorate

Seville Lodge, Callan Road
Kilkenny, Ireland
T +353 56 779 6700
F +353 56 779 6798

Regional Inspectorate

John Moore Road, Castlebar
County Mayo, Ireland
T +353 94 904 8400
F +353 94 902 1934

Regional Inspectorate

The Glen, Monaghan, Ireland
T +353 47 77600
F +353 47 84987

Regional Offices

The Civic Centre,
Church St, Athlone,
Co. Westmeath, Ireland
T: +353 906 475722

Room 3, Raheen Conference Centre,
Pearse House, Pearse Road,
Raheen Business Park, Limerick,
Ireland
T +353 61 224764

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