CAMLIN_060

(Camlin Priority Area for Action)

Local Catchment Assessment Supporting information.

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1. Introduction

This report details the findings from the local catchment assessment (LCA) carried out in the CAMLIN_060 waterbody, which is part of the Camlin Priority Area for Action.

Urban wastewater and urban run-off were identified as two significant pressures in the CAMLIN_60 in the initial characterisation and this report outlines the findings by LAWPRO of these two pressures.

Two referrals were made to ASSAP regarding agricultural pressures within the waterbody which was also listed as significant. One referral was sent to Longford County Council for a discharge from a developer led infrastructure. This will need further assessment to determine if it is significant or not.

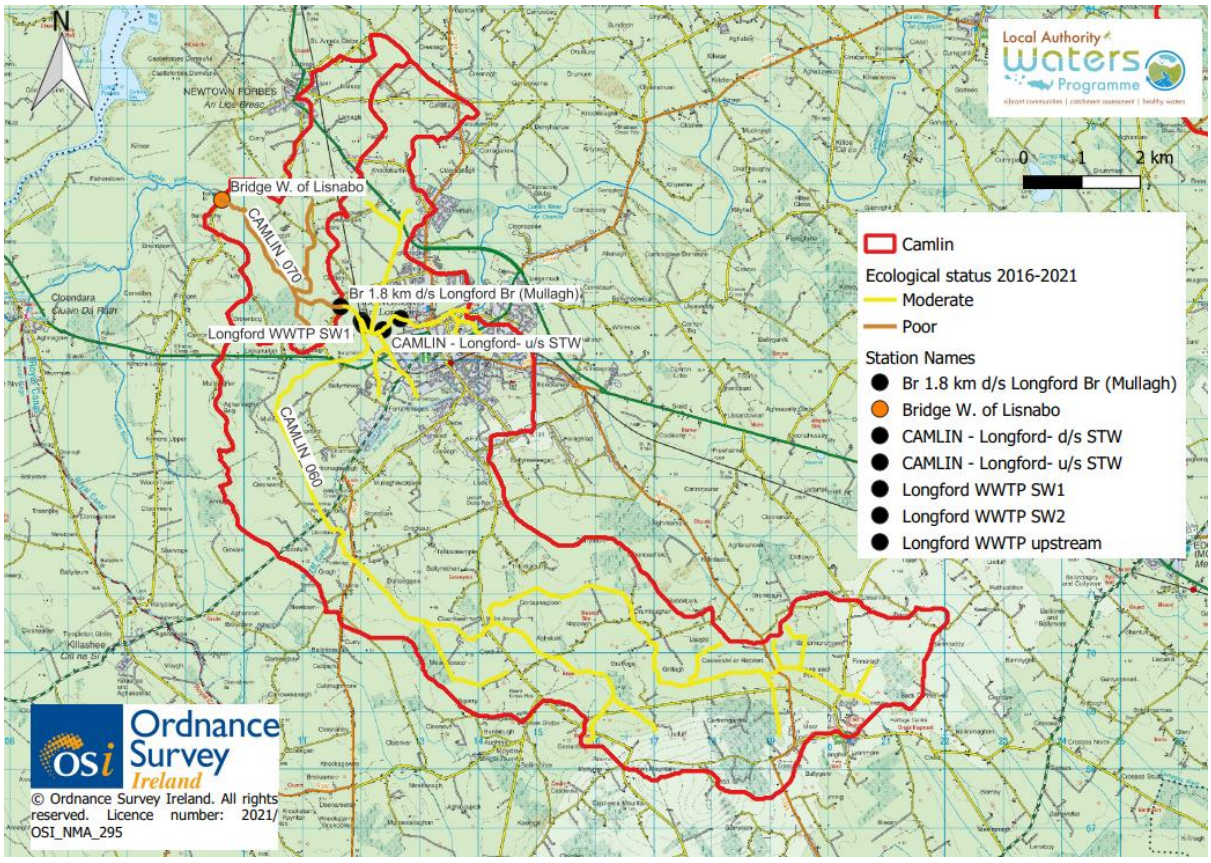


Figure 1 The CAMLIN_060 waterbody in the Camlin Priority Area for Action

Main Findings

- The CAMLIN_060 is 37.54 km in length and is AT RISK of not meeting its Water Framework Directive objective of Good Ecological Status by 2027. It was unassigned biologically & ecologically in terms of its WFD status for the second cycle of the River Basin Management Plan. This was reviewed for the third cycle of the River Basin Management Plan, and it was assigned MODERATE ecological status based on modelling.

- The waterbody flows through Longford town and has one main inputting tributary known locally as the Ardagh river, which rises in a peat bog North of Ardagh and confluences with the main channel of the Camlin at Mullagh, Southwest of Longford town. There are three small inputting waterbodies in Longford town, one of which is culverted.
- Water quality in the CAMLIN_050 is at good status (Q4, 2017) at the Mall bridge in Longford town (Station Code RS26C01088). There is no operational chemistry for this monitoring point. Biological Q status dropped to POOR (Q3, 2017) at the next monitoring station at the Camlin_070 Bridge W. of Lisnabo (Station code RS26011000) indicating that there was a significant pressure in between these two stations as there is a drop of two biological classes. These stations were resampled by the EPA in 2020. The Mall bridge in Longford town (Station Code RS26C01088) remained at Q4 and the CAMLIN_070 waterbody Bridge W. of Lisnabo (Station code RS26011000) improved to Q4 GOOD biological status. This suggests there have been measures implemented between the two stations to bring about improved water quality.
- The CAMLN_060 was unassigned up until 2015, but the EPA assigned a modelled status of MODERATE (2016-2021). There is no biological sampling on the CAMLIN_060 since 2005 (Q3-4 MODERATE), however, from assessing and interpreting the physico-chemistry at the operational monitoring station Bridge 1.8 km downstream of Longford Bridge (Mullagh), orthophosphate, total ammonia and BOD were significant issues in this waterbody. The most significant source of these nutrients was found to be from urban wastewater and urban diffuse pressures. The annual average concentrations of orthophosphate and total ammonia exceeded the EQS for these parameters, and there are frequent outliers suggesting periodic or intermittent pollution events, albeit there are improving chemistry trends from 2020 onwards.
- The CAMLIN_060 is designated sensitive area under the Urban Wastewater Treatment Regulations 2001 (S.I. No. 254 of 2001). This designation applies from the treatment plant downstream to the confluence of the Camlin with the Shannon (six kilometres).
- There are two ambient monitoring stations in the CAMLIN_060 waterbody:

➢ The monitoring station Longford WWTP Upstream Station Code RS26C010857, which is the upstream monitoring point for the Longford agglomeration.

➢ The monitoring station Br 1.8 km d/s Longford Br (Mullagh) RS26C010900, which is the downstream monitoring point for the Longford agglomeration, and it is also the WFD operational monitoring point.

The location of the receiving water /ambient monitoring points for the agglomeration, the primary discharge point (SW001) and storm water overflow (SW002) from the agglomeration are shown in Figure 2 below.

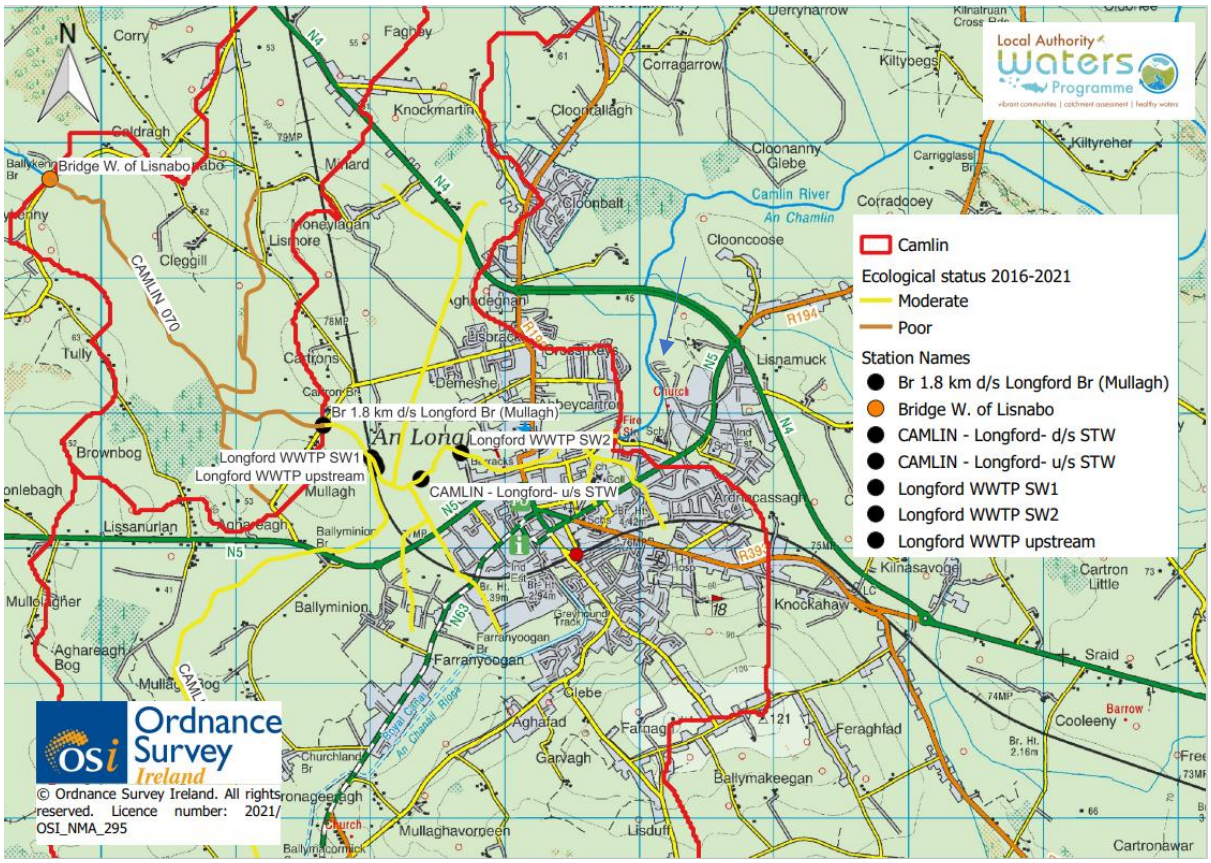


FIGURE 2 The location of Longford WWTP primary discharge and storm water overflow SW002 in relation to the ambient receiving water monitoring stations for the Longford agglomeration.

- The primary discharge from Longford Wastewater Treatment Plant (D0060-01) is located approximately 452m upstream of station RS26C010900), the river width is approximately 12 m which means that the WFD monitoring station is outside of the mixing zone, and deemed appropriate for assessment, however it should be noted that there is an inputting waterbody in between the two monitoring points which has been accounted for in load assessments (Appendix 1).
- The desk study identified total ammonia, orthophosphate, and biological oxygen demand (BOD) in WFD data as significant issues in this waterbody up to 2020 at Station Br 1.8 km d/s Longford Br (Mullagh) RS26C010900, which is located downstream of the agglomeration. A referral was made to the EPA to highlight that, based on desk study loadings, Longford Wastewater Treatment Plant (D0060-01) was a significant pressure, however from 2020 onwards, urban diffuse is the primary significant pressure.
- There is no upstream monitoring location is specified in the wastewater discharge licence, only a downstream monitoring location has been designated. For compliance monitoring purposes, the upstream monitoring point is located immediately upstream of the primary discharge (SW001) and downstream of stormwater overflow (SW002) and hence does not consider full extent of impact from the agglomeration. It is estimated that there are several SWOs and pumping stations on this agglomeration, each of these will have to be examined and prioritised for measures by Uisce Éireann.
- There is ferric dosing on site but it is not being used. Alum sludge from a number of drinking water plants is imported to the treatment process and this is used to control the

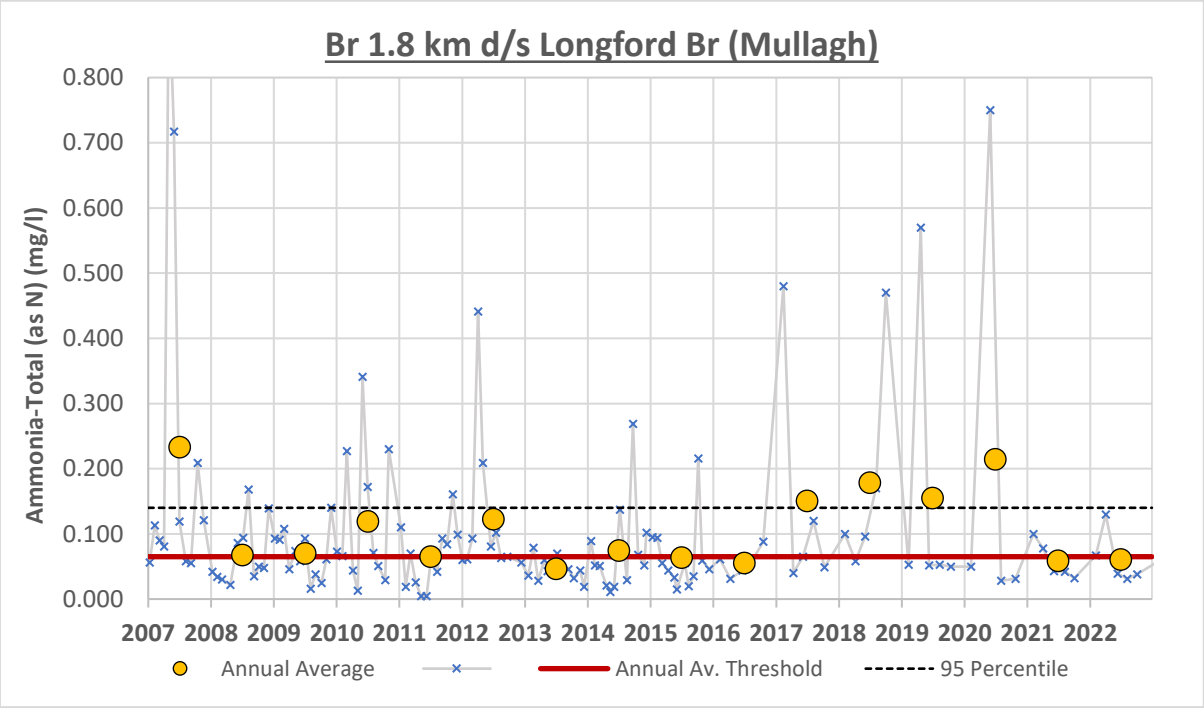
level of phosphates in the final effluent (Longford County Council). The primary discharge has 754 µg/l aluminium for sample taken on the 22/01/2020. It is unclear if this level of aluminium has an impact on fish populations.

- Longford wastewater treatment plant (SW001) is generally compliant with its authorisation - data reviewed in the 2018 AER indicated that there were 1 exceedance for the Total ammonia ELV set out in the Longford WWTP (D0060-01) in 2018. The annual mean total ammonia value in the discharge was 1.85 mg/l N. There were no exceedances in 2019 and once exceedance for Total Ammonia in 2020 and it was compliant in 2021. Technical Amendment D0060-01/C to the discharge licence issued by the EPA on the 21st of June 2017 imposed new tighter maximum emission limit values (ELVs) on the primary discharge of 0.8 mg/l total ammonia (down from 5mg/l), a new ELV of 0.44 mg/P orthophosphate and an ELV of 15 mg/l cBOD of (down from 20 mg/l). There was a decreasing trend in total ammonia, BOD, and orthophosphate thereafter.
- In conclusion, comparing the upstream and downstream data (Appendix 6), there are significant pressures upstream of the primary discharge (SW001) which can be classified as urban diffuse pressures. These may include discharges from SW002, which is located upstream of the primary discharge point (SW001), and this requires further assessment.
- An unlicensed discharge was referred to Longford County Council at Stonepark from developer provided infrastructure. This will need to be assessed further by Longford County Council to determine its significance.
- Some SWOs were noted not to be on the authorisation. A workshop was organised with Uisce Éireann and Longford County Council on the 1st of February 2023 may help clarify all discharges to the Camlin River.

Significant issue trends:

WFD status is monitored at Br 1.8 km d/s Longford Br (Mullagh) Station code RS26C010900 is located downstream of the agglomeration.

Annual average Total ammonia ranged from below the EQS (0.065mgN/L) to over 11 times the EQS (0.75 mg/l on the 02/06/2020). An upward trend was evident from 2016 – 2020, with a marked decrease thereafter.

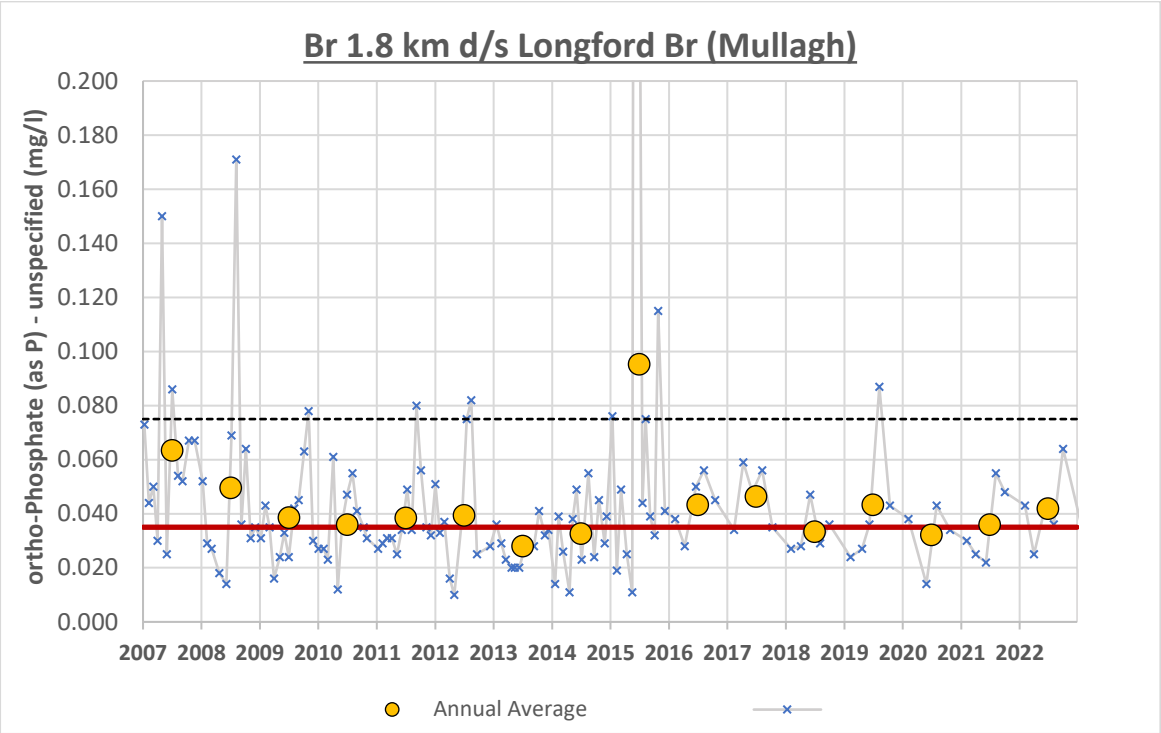


GRAPH 1 The total ammonia-total (as N) (Annual Average) trend for the operational monitoring station Br 1.8 km d/s Longford Br (Mullagh) Station code RS26C010900. Concentration of 0.95mgN/L in April 2007 not shown on graph.

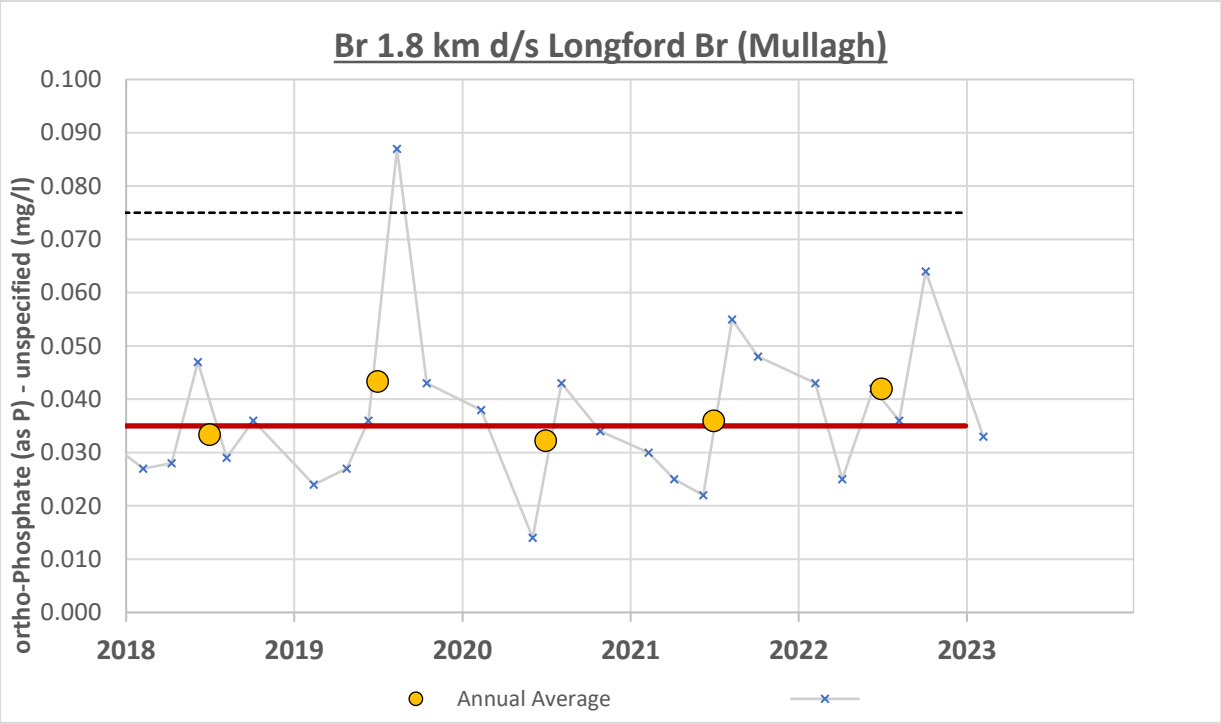
Data from Met Éireann at the Termonbarry weather station (10 km away) recorded some heavy rainfall in the mg/l at the operational monitoring point preceding days to these spikes. On the 4th of October, there was a value of 0.47mgl/l total ammonia at the operational monitoring point but no heavy precipitation was recorded at the Termonbarry station however, there could have been more localised rain fall events. On the 25th of April 2019, there was a value of 0.57 mg/l total ammonia at the operational monitoring point and precipitation value of 9.1 mm the preceding day. On the 2nd of June 2020, there were no precipitation data available, but a value of 0.75 mg/l total ammonia recorded at the downstream monitoring station.

Graph 2 shows the orthophosphate annual average value trends at the downstream WFD monitoring station. Temporal monitoring data at the downstream monitoring station shows improvement however there regular breaches of the mean orthophosphate EQS. This data

should be examined further regarding telemetry/ flow monitoring for spill patterns at SWO002 if available. The spikes in orthophosphate do not correlate with the spikes in total ammonia.

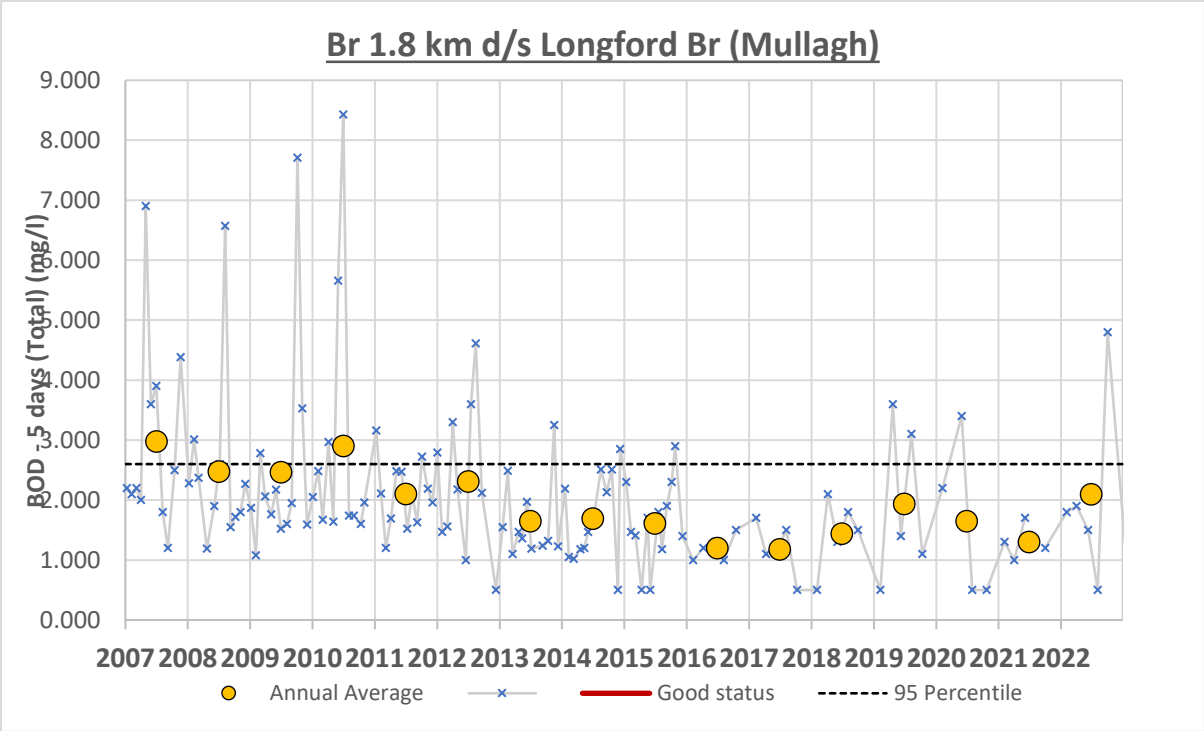


GRAPH 2 The orthophosphate (as P) (Annual Average) trend for the operational monitoring station Br 1.8 km d/s Longford Br (Mullagh) Station code RS26C010900.



GRAPH 3 The increasing orthophosphate (as P) (Annual Average) trend for the operational monitoring station Br 1.8 km d/s Longford Br (Mullagh) Station code RS26C010900.

Graph 4 below shows BOD annual average value trends at the downstream WFD monitoring station. Temporal monitoring data that there was a recent breach of the EQS on the 05/10/2022 of 4.8mg/l BOD at the operational monitoring point. Spikes for BOD, Orthophosphate and Total Ammonia don't always correlate e.g., Spikes for BOD and orthophosphate for the 5th of October 2022 but no spikes were present on this date for for total ammonia.



GRAPH 4 The BOD (mg/l) (Annual Average) trend for the operational monitoring station Br 1.8 km d/s Longford Br (Mullagh) Station code RS26C010900.

2. Was urban wastewater identified in the initial characterisation of the waterbody?

Yes, the initial characterisation identified Urban Wastewater (agglomeration >10,000 Longford D0060-01) and urban run-off (diffuse urban) as two significant pressures on the CAMLIN_060, the other being agriculture subcategory pasture (as detailed in Table 1). Three IA6s for the waterbody were referred to LAWPRO (as detailed below in Table 2) in relation to these significant pressures, requesting further investigation. This action was carried out during local catchment assessment for the CAMLIN_060 waterbody.

Waterbody		Waterbody Type	Risk	Status objective	Eco. Status					Pressures			
Name	Code				2007-2009	2010-2012	2010-2015	2013-2018	2018-2021	Category	Sub-category	Significant?	impact

CAMLIN_060	IE_SH_26C010900	River	AT RISK	Good(2027)	GES	U	U	U	M	Urban wastewater	PE > 10,000	Yes	Total ammonia
										Urban Run-off	Diffuse urban	Yes	Organics / total ammonia
										Agriculture	Pasture	Yes	Nutrients

Table 1 Significant Pressure Information – CAMLIN_060 waterbody (2nd cycle of River Basin Management Plan.

Water body Name	Waterbody Code	Category	Sub-Category	Details	Responsible Organisation
CAMLIN_060	IE_SH_26C010900	WBP0002446	IA6 Multiple Sources in Large Urban Area	Longford Wastewater Treatment Plant is identified as a significant pressure. Total nitrogen and total ammonia exceedances noted at the WWTP. WWTP has previously been subject to shock loading. Further investigation required to determine the extent of the impacts. Pressure Type: Urban Wastewater	LAWPRO
CAMLIN_060	IE_SH_26C010900	WBP0003363	IA6 Multiple Sources in Large Urban Area	Misconnections in Longford town have been identified as a significant pressure. Further investigation is required to determine the nature and extent of the impacts. Mean annual concentrations of phosphate exceed the EQS for Good status. Mean annual concentrations of total ammonia recently exceed the EQS (2011, 2012 and 2014). Pressure Type: Urban Diffuse	LAWPRO
CAMLIN_060	IE_SH_26C010900	WBP0003364	IA6 Multiple Sources in Large Urban Area	Agriculture (Pasture) SLAMv2.04: pastures 32% P. PIP (SW/P) is rank 1 and 2 across the centre of the sub-basin. No biology data, baseline concentrations of phosphate exceed the EQS. Mean annual concentrations of phosphate exceeded the EQS for Good status in 2015. Pressure Type: Agriculture	LAWPRO

Table 2 IA6s assigned to LAWPRO for the CAMLIN_060

3. Is the WWTP considered to be a Significant Pressure?

It is likely that the urban wastewater treatment plant was a significant pressure for total ammonia up to 2020 but when carrying out mass balancing calculations (See Section 3.1.2) using the new maximum Emission Limit Values for the agglomeration in effect since Jan 2020, it is thought that the primary discharge (SW001) is no longer significant and that upstream urban diffuse pressures should be prioritised for mitigation measures. Mass balance calculations are detailed in Appendix 1. These calculations used a flow estimate from the EPA hydrotool at the downstream monitoring station RS26C010900. The average hydraulic loading and final effluent concentrations annual averages from the 2019 AER were used in these calculations (which were much improved on 2018 values). Upstream and downstream data for 2016 to 2019 are displayed in Appendix 6 with downward trend evident.

4. Are the storm water Overflows considered to be a Significant Pressure?

Although we have no data in relation to SW002, there is a concern that frequent and substantial discharges from SW002 (pumping station) at the Little Water Street pumping station may be having impact on both the water quality. While there has been a marked reduction in total ammonia since 2020, ambient data is displaying breaches of the total ammonia, orthophosphate, and BOD EQS. The spikes do not always correlate with each other. Table 3 lists the available data for uncontrolled releases for SW002 since 2016. There is no information available regarding the volumes discharged from SW002 in the 2019, 2020, 2021 AERs. This pumping station warrants further assessment by Uisce Éireann.

Year	No. of times activated in year (No. of events)	Total volume discharged in (m3)	Total volume discharged in (P.E.)	Assessed against DoEHLG criteria
2016	33	87,762	1,069	Meeting
2017	40	43,389	679	Meeting
2018	49	66080	No data included in AER	Meeting
2019	Unknown	Unknown	Unknown	Meeting
2020	Unknown	Unknown	Unknown	Meeting
2021	Unknown	Unknown	Unknown	Meeting

Table 3 Overflow data for SW002 (Source: Uisce Éireann)

The significant breaches of the EQS in all three parameters sometimes occurs with higher precipitation levels. For example, when looking at historical Met Éireann precipitation data for the Termonbarry weather station, there was a rainfall event on the 8th of November 2016

(15.1mm of rain) and looking at the physico-chemistry data for the 9th November, there was a BOD result of 5.2mg/l and the total ammonia was 0.126 mg/l at the upstream monitoring point, which is upstream of the primary discharge and the Ardagh River confluence. Again, on the 8th of June 2018, there was 19.2 mm of precipitation, there were resultant peaks in the chemistry for total ammonia & BOD of 0.18 mg/ and 1.7 BOD for the 13th of June 2018. It is likely that these figures would have been higher if the samples were taken 3 days earlier. The total ammonia in the river was 0.57 mg/l at the operational monitoring point on the 25th of April 2019 possibly due to elevated rainfall in the previous day. This is over 4 times the 95%ile EQS for this parameter. The impact of these overflows seems to be reflected in the biology with only tolerant taxa present in samples. If these overflows occur in low flow periods, the impact could be more pronounced. It is also likely that the inputting tributary on the CAMLIN_060 (the Ardagh river), can dilute or increase the downstream monitoring point concentrations depending on the pollution sources / rainfall patterns. This tributary was spot sampled on three occasions at Stonepark (Easting: 211899.63, Northing: 271550.40) and results are shown in appendix 7 and the waterbody is probably impacted and *AT RISK*. A discharge from a developer led treatment system for a nearby housing development was noted and referred to Longford County Council for further assessment in 2020.

During local catchment assessment, several pumping stations and network SWOs on this agglomeration were noted and each of these will have to be examined further by Uisce Éirean.

The pumping stations and SWOs are listed in Table 3 and 4. Some of the overflows were unknown at the time of assessment or inaccessible. It is likely that this urban diffuse pressure is now the most significant issue on the CAMLIN_060 waterbody and the only realistic way of assessing this pressure is through a drainage area plan as they are intermittent discharges.

LA Identifier	Licence	Maximo No.	PS Name
Longford SPS04	D0060-01	L121875	AbbeycartronSPS
Longford SPS05	D0060-01	L215714	BatteryCourtSPS
Longford SPS06	D0060-01	L215713	BrickfieldSPS
Longford SPS07	D0060-01	L215712	ClonbaltWoodsSPS
Longford SPS08	D0060-01	L121395	FoynescourtSPS
Longford SPS09	D0060-01	L215715	IarnRoidSPS
Longford SPS10	D0060-01	L122540	Knockmartin(foul)SPS
Longford SPS11	D0060-01	L122541	LisbrackSPS
Longford SPS12	D0060-01	L121074	LittleWaterStreetSPS
Longford SPS13	D0060-01	L120983	MastertechSPS
Longford SPS14	D0060-01	L121075	TownsparkSPS
Longford SPS15	D0060-01	L121074	LWSstormPS
Longford SPS16	D0060-01	L100691	RAS(WAS)LongfordSPS
Longford SPS17	D0060-01	L121074	LWSreturnSPS
Longford SPS18	D0060-01		FlancareSPS
Longford SPS19	D0060-01		DunnesSPS
Longford SPS20	D0060-01	L122540	Knockmartin(vacuum)SPS

Table 3 List of pumping stations on the network

Agglomeration	Asset	Emission Code	WFD Code (Water Body) (Water Body)	Irish Grid Ref.
Longford	Network	TBC	TBC	213318.921, 275682.42
Longford	Network	TBC	TBC	213666, 275325
Longford	Network	TBC	TBC	213666, 275325
Longford	Network	TBC	TBC	213671, 277740
Longford	Network	TBC	IE_SH_26C010800	TBC
Longford	Network	TBC	IE_SH_26C010900	TBC
Longford	Network	TBC	IE_SH_26C010800	TBC

Table 4 List of SWOs on the network

Little Water Street Pumping Station and Storm Water Overflow (SW002)

We were unable to sample this overflow, however a loading could be potentially attributed to it. The EPA has requested that Uisce Éireann review the hydraulic capacity needed at the plant and storm water tank using up to data information assess the performance of this overflow and carry out improvements needed to ensure the collection system has enough capacity to collect, retain and convey all waste water to the treatment plant during all normal local weather conditions and all normal seasonal variations in waste water load; and discharges from the storm water tank do not prevent the receiving waters from meeting their environmental

objectives. The poor water quality noted upstream of the ambient UWW monitoring point would need further assessment to see if it linked to this overflow.

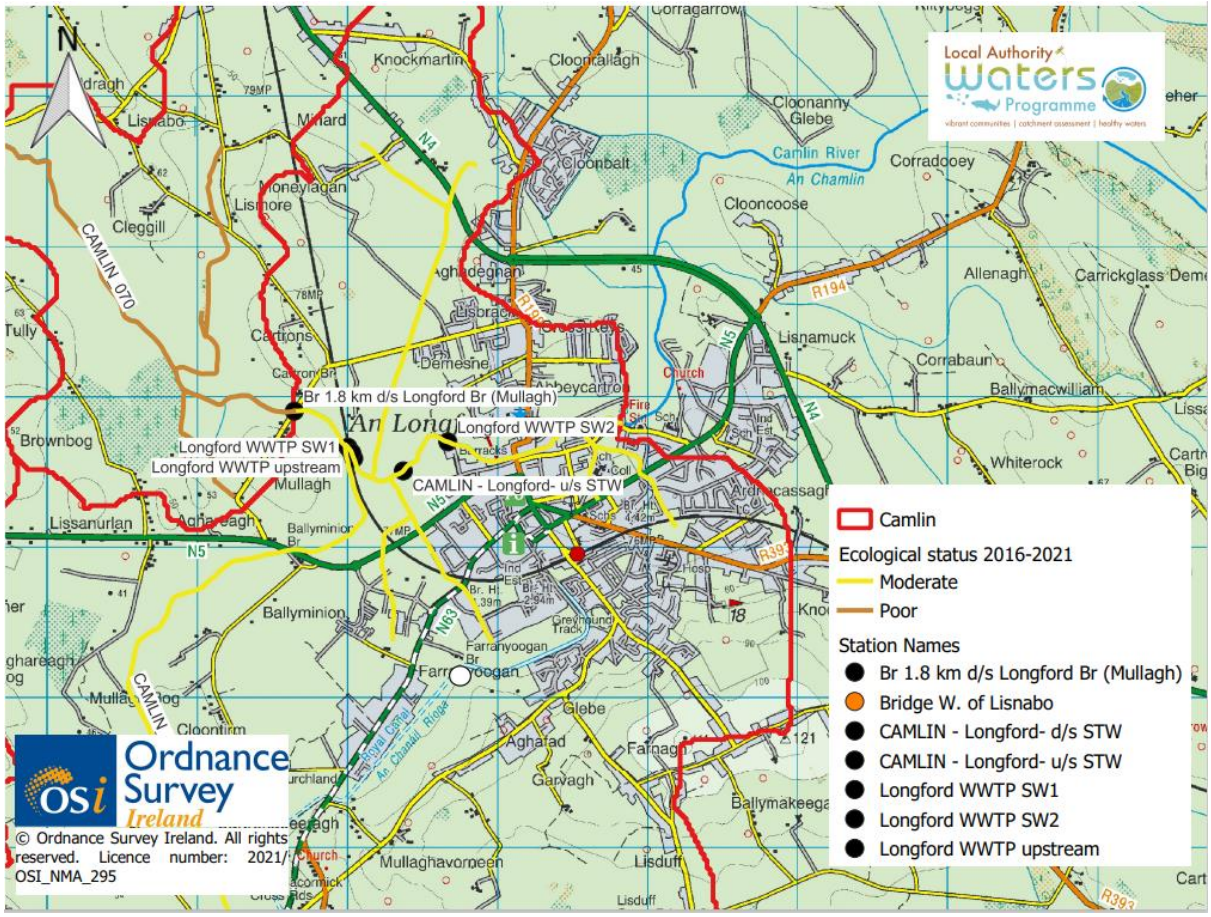


FIGURE 3 Location of the Primary discharge and SW002 overflow from the pumping Station at Little Water Street.

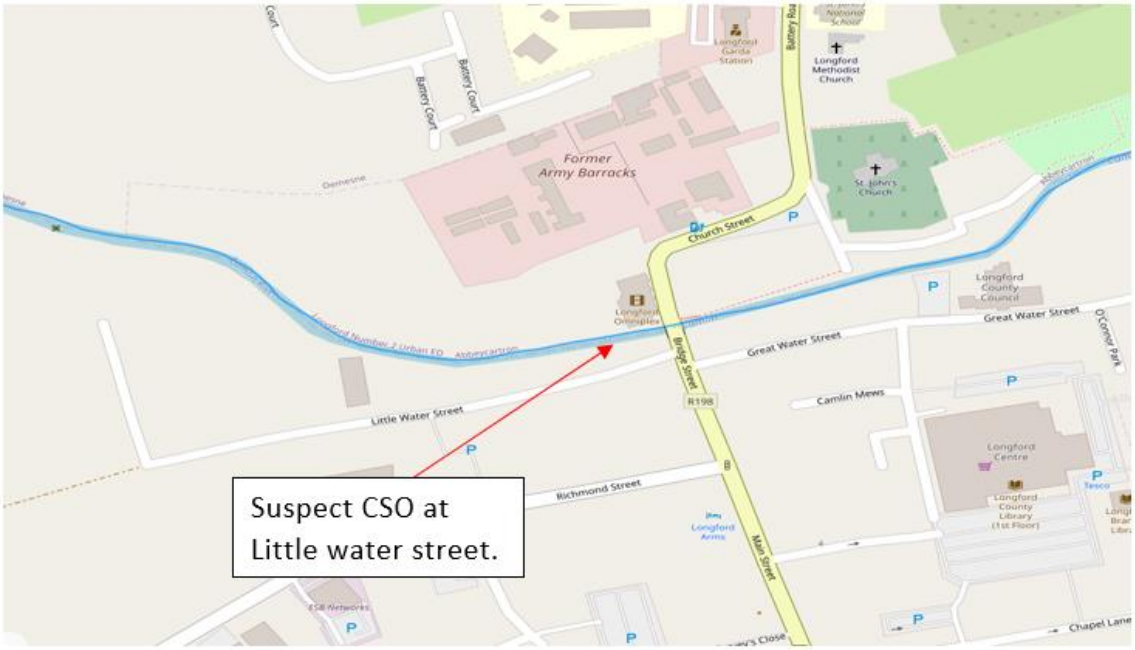


FIGURE 4 Suspect Combined Sewer Overflow at Little Water Street.

The suspect combined sewer overflow at Little Water Street was sampled on the 7/07/2020 and had the following parameter values - BOD was 126.4 mg/l, total ammonia was 2.3 mg/l and Ortho-P was 0.16 mg/l suggesting that it is from a combined network.

FIGURE 5 Suspect CSO at Little Water Street which is activated in moderate rain conditions.

The overflow at Church Street was sampled on the 7/07/2020 and contamination (BOD 6.1 mg/l, Total ammonia 0.02 mg/l and Ortho-P 0.02 mg/l).

FIGURE 6 Overflow at Church Street.

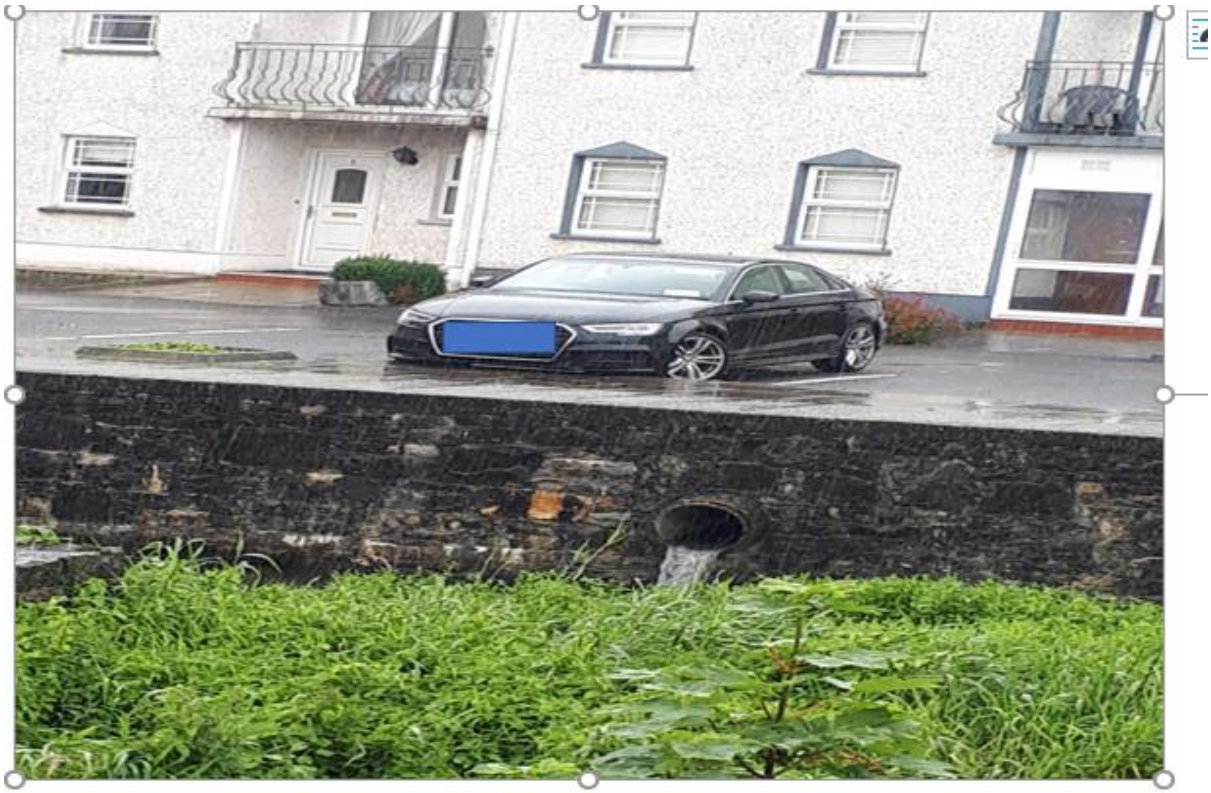


FIGURE 7 Contaminated Surface Water overflow at Church Street carpark.

A collapsed manhole required remediation works by Longford County Council in Sept 2020. This removed the discharge of raw sewage beside Longford Bridge. The impact of this is unknown

(Figure 8). There may also be other overflows discharging under the waterline that are not visible during LCA. Surcharging of the line may need assessment in some locations (Figure 9) and there is evidence of misconnections in some locations (Figure 10)

FIGURE 8 Collapsed sewer near the cinema which was rectified.

Figure 9 Manhole which needs assessing for overflows near Connaught Road.

Figure 10 Surface water discharge pipes which may need further assessment at Connaught Road.

Figure 11 Sections of inputting waterbodies are culverted in the Panelto industrial estate so could not be assessed for water quality.

Local Catchment Assessment Findings

- Local catchment assessment was undertaken at the headwaters of the CAMLIN_060 and Ardagh wastewater treatment plant was ruled out as a significant pressure. This agglomeration is located at the headwater of the incoming tributary the Ardagh river and serves Ardagh village. After consultation with UÉ, it transpired that the sewerage is tankered away to the Longford Agglomeration for treatment and that there was no direct discharge to the CAMLIN_060 waterbody. Very poor biological water quality was found downstream 13/08/2019, which resulted in an SSIS score of 0 – "probably impacted" with only very tolerant invertebrate taxa found downstream (only *Chironomus, Gammerus* and *Tubificidae* species present in sample). An agricultural

referral was issued to the ASSAP programme instead due to impacted water quality found at this location.

- The deterioration of Q values indicates an impact at the monitoring point and the physico-chemistry indicate that is this occurring between the mall bridge and the upstream monitoring point suggesting urban diffuse is the most significant pressure in this waterbody.

Table 4 SSIS Results for the CAMLIN_060 waterbody

Site	Date	SSIS Score Value Score	Further Information
Bridge on the R393 (downstream of Ardagh WWTP)	13/08/ 2019	0	Probably Impacted - dominated by *chironmous, Simuliidae* and *Asellus*
Mt Jessop Bridge	13/08/ 2019	4.8	Probably Impacted *Similidae* and *asellus* present but at a lower ambundance.
Stonepark	13/08/ 2019	4.8	Probably Impacted *Similidae* and *asellus* present but at a lower ambundance.
Connolly Crescent, North of St. Mel's College	13/08/ 2019	2.4	Probably Impacted - dominated by chironmous, Simuliidae and Asellus

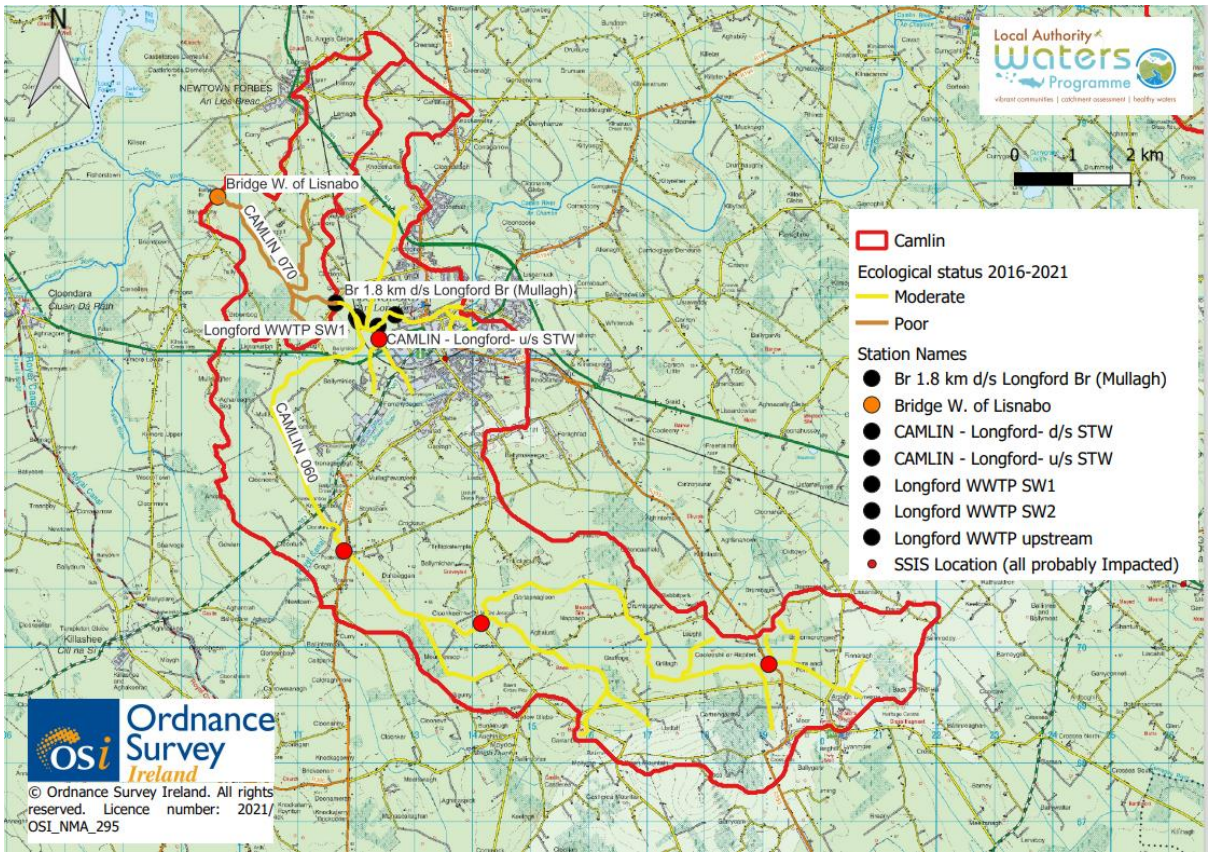


FIGURE 12 SSIS Biological data for the Camlin_060 waterbody – all sites (red) were probably impacted.

Figure 13 Downstream of Ardagh village, very poor water quality was found at (Bridge on the R393). SSIS Score of 0 “probably impacted”.

Figure 14 Discharge from a development led wastewater treatment at Stonepark that was referred to Longford County Council for further assessment.

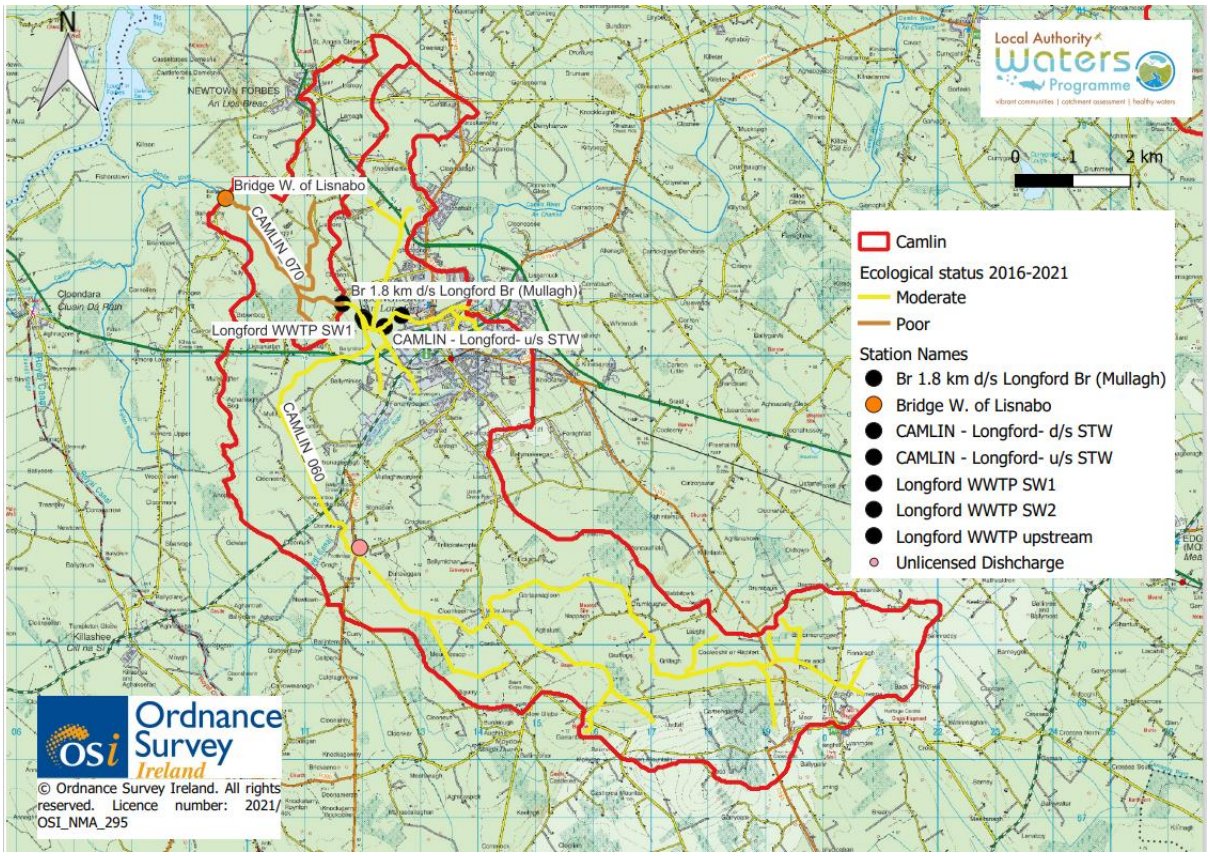


Figure 15 Unlicensed Developer Provided Infrastructure Discharge Location which was referred to Longford County Council.

Figure **16** SWO to the rear of Dunnes Stores

Figure 17 SWO to the rear of Dunnes Stores to be assessed for misconnections due to impacted water quality downstream.

Figure 16 Pumping station at Mastertech /N63 with emergency overflow at bridge.

Figure 17 Overflow behind Ardnacassa Lawns estate

Figure 18 Overflow behind Ardnacassa Lawns estate

5. Significant Issues and Pressures in the CAMLIN_060

- Regarding the urban wastewater pressure, mass balancing calculations no longer deem that the primary discharge SW001 of Longford Wastewater Treatment Plant is a significant pressure in the CAMLIN_060 waterbody.
- Data from the desk study and field assessments outlined above have confirmed that urban diffuse discharges from the Longford Agglomeration is the likely significant pressure in the CAMLIN_060 waterbody and requires a full assessment by Uisce Éireann.
- It is likely that there are also sources of nutrients from agriculture from the inputting waterbody originating from Ardagh.
- The contribution from the stormwater overflows has not been fully assessed in this report, however it is likely that SW002 is a significant contributor to loadings to the CAMLIN_060 and should be prioritised by Uisce Éireann for further assessment along with the other overflows present in this section of the river.
- There are no improvements scheduled, however Longford has been included for a drainage area plan assessment which commenced in August 2022.
- Total ammonia, orthophosphate and BOD at Br 1.8 km d/s Longford Br (Mullagh) RS26C010900 is the appropriate response indicators for this waterbody.
- A summary of the proposed recommend actions for the CAMLIN_060 waterbody is listed below in Table 7.

6. Uisce Éireann Capital Investment Plan

Uisce Éireann (IW) have confirmed that a drainage area plan is scheduled for the Longford and is in the initial stages. This will help clarify the location and significance of urban diffuse pressures.

TABLE 7 RECOMMEND ACTIONS

Waterbody Name	Pressure Category	Pressure Subcategory	Significant Issue confirmed by LCA	Referral to	Recommended actions
CAMLIN_060	Urban Wastewater	Longford Agglomeration Diffuse urban (both network and pumping station)	Total ammonia, BOD and orthophosphate at d/s monitoring location	Uisce Éireann/EPA	Primary Discharge: If the licensing authority are satisfied that the new max ELVs that have commenced as of 1st Jan 2020 are sufficient, there is no further action for LAWPRO as there has been significant improvements in chemistry and data showed pressures are upstream of SW001.
CAMLIN_060	Urban Diffuse	Diffuse urban (both network and pumping stations)	Total ammonia, BOD and orthophosphate at u/s monitoring location	Irish Water /EPA	All overflows listed in this fieldwork report, including SW002 will have to be assessed and prioritised on an individual basis for decommissioning/remediation works where necessary to deliver improvements at the monitoring point for CAMLIN _060. The overflows located downstream of the Mall Bridge should be prioritised for assessment / remediation/decommissioning.

APPENDIX 1 MASS BALANCING CALCULATION 2019 AVERAGE CONCENTRATIONS

Facility Name (only enter data in yellow cells!)	Longford	Reference Number: *Licence/COA number as*	DL0060-01

1) 95%ile river flow at nearest downstream WFD monitoring point

either enter lps data in cell B3 or enter lpd data into cell D3, overwriting cell formula (1m3= 1000 litres)

River Flow	0.77839	m3/sec	6.7E+07	lpd

2) Effluent Dry Weather Flow (DWF)

*usually determined by PE*200lpd*

Effluent D	5922	m3/day	5922000	lpd
Total D/S flow			7.3E+07	lpd

3) Resultant concentration calculations for the discharge at nearest downstream WFD monitoring point

	Upstream conc using notional clean conc (mg/l)	U/S Conc (actual) mg/l	Upstream load using notional clean conc (mg/l)	U/S Load (actual) (mg/d)	Annual Average Effluent Conc	Effluent Load (mg/d)	Total Load using notional clean (mg/d)	Real Total Load (mg/d)	Final D/S Conc using notional clean (mg/l)	Final D/S conc using actual results (mg/l)	95%ile EQS (Cmax)
BOD (mg/l	0.26	1.31	1.7E+07	9E+07	2.42	1.4E+07	3.2E+07	1E+08	0.43	**1.400**	2.60
P (mg/l)	0.005	0.045	336264	3E+06	0.03	177660	513924	3204033	0.007	**0.044**	0.075
NH4-N (m	0.008	0.204	538022	1E+07	0.44	2605680	3143702	1.6E+07	0.04	**0.223**	0.14

4) Headroom assessment (at nearest downstream WFD monitoring point), using existing water quality or adjusted background:

Head Room mg/l = Cmax-C

Cmax = Max permissible conc (EQS) (mg/l)

C = Background upstream conc. (mg/l)

	mg/l
BOD Headroom =	1.29
MRP Headroom =	0.03
Ammonia N Headro	-0.06

	Upstream conc (mg/l)	D/S Conc mg/l	age Headroom
BOD	1.31	1.40	7
MRP	0.045	0.044	-4
NH4N	0.204	0.223	-30

5) Headroom assessment (at nearest downstream WFD monitoring point), using notional clean figures:

Head Room mg/l = Cmax-C

Cmax = Max permissible conc (EQS) (mg/l)

C = Background upstream conc. (mg/l)

	mg/l
BOD Headroom =	2.34
MRP Headroom =	0.07
Ammonia N Headro	0.13

	Upstream conc (notional clean)	Final D/S Conc mg/l	Percentage Headroom
BOD	0.260	0.435	7
MRP	0.005	0.007	3
NH4N	0.008	0.043	26

- No average ortho-P was given in the 2019 only total P so the 2018 average mean Ortho-P value of 0.03 mg/l P was used in mass balanacing assessments.

APPENDIX 2 MASS BALANCE CALCULATIONS (ELVS AS OF 1/01/2020)

Facility Name (only enter data in yellow cells!)	Longford	Reference Number: *Licence/COA number as relevant*	DL0060-01

1) 95%ile river flow at nearest downstream WFD monitoring point

either enter l/s data in cell B3 or enter lpd data into cell D3, overwriting cell formula (1m3= 1000 litres)

Hiver Flow	0.77839	m3/sec	6.7E+07	lpd

2) Effluent Dry Weather Flow (DWF)

*usually determined by PE*200lpd*

Effluent D	5922	m3/day	5922000	lpd
Total D/S flow			7.3E+07	lpd

3) Resultant concentration calculations for the discharge at nearest downstream WFD monitoring point

	Upstream conc using notional clean conc (mg/l)	U/S Conc (actual) mg/l	Upstream load using notional clean conc (mg/l)	U/S Load (actual) (mg/d)	Annual Average Effluent Conc	Effluent Load (mg/d)	Total Load using notional clean (mg/d)	Real Total Load (mg/d)	Final D/S Conc using notional clean (mg/l)	Final D/S conc using actual results (mg/l)	95%ile EQS (Cmax)
BOD (mg/l	0.26	1.31	1.7E+07	9E+07	15	8.9E+07	1.1E+08	1.8E+08	1.45	**2.418**	2.60
P (mg/l)	0.005	0.045	336264	3E+06	0.44	2605680	2941944	5632060	0.040	**0.077**	0.075
NH4-N (mg	0.008	0.204	538023	1E+07	0.8	4737600	5275623	1.8E+07	0.07	**0.252**	0.14

4) Headroom assessment (at nearest downstream WFD monitoring point), using existing water quality or adjusted background:

Head Room mg/l = Cmax-C

Cmax = Max permissible conc (EQS) (mg/l)

C = Background upstream conc. (mg/l)

	mg/l
BOD Headroom =	1.29
MRP Headroom =	0.03
Ammonia N Headroo	-0.06

	Upstream conc (mg/l)	Final D/S Conc mg/l	Percentage Headroom
BOD	1.31	2.42	86
MRP	0.045	0.077	107
NH4N	0.204	0.252	-75

5) Headroom assessment (at nearest downstream WFD monitoring point), using notional clean figures:

Head Room mg/l = Cmax-C

Cmax = Max permissible conc (EQS) (mg/l)

C = Background upstream conc. (mg/l)

	mg/l
BOD Headroom =	2.34
MRP Headroom =	0.07
Ammonia N Headroo	0.13

	conc (notional clean) (mg/l)	Final D/S Conc mg/l	Headroom utilised
BOD	0.260	1.453	51
MRP	0.005	0.040	50
NH4N	0.008	0.072	49

APPENDIX 3 TOTAL AMMONIA LOAD REDUCTION CALCULATIONS

Longford UWWT_ Total ammonia Load Calculations								
	units	US station (RS26C010857	DS station (RS26C010900	Increased contribution attributed to the Agglomeration and WWTP	Load reduction required in kg/day to reduce to 0.060 mg/l N at d/s monitoring station	UWW primary discharge contribution from 2019 AER Kg/day	Contribution from primary discharge as a % of load reduction required.	Comments
2019 baseline NH4N	mg/l N	0.204	0.275					
Q30	m3/sec	3.74574	4.55196					
Q30	litres/day	323,631,936	393289344					
Total Total ammonia as N	kg/d	66.02	108.154 - CAMLIN_060 loading (3.01) = 105.144	39.137	140.48	2.6	1.8	SWO contribution not assessed no discharge volumes available in the 2019 AER.
UWW primary discharge calculation:								
2019 Annual Mean NH4-N	mg/l	0.44						
2019 Avg Effluent flow	m3/day	5922						
Total WWTP contrib	kg/d	2.6						

ution (primary discharge only):			

- Total ammonia values in the CAMLIN_060 are approx. 0.054 mg/l as N and a flow rate of 0.646592 m/3 Source: Hydrotool

APPENDIX 4 ORTHOPHOSPHATE LOAD REDUCTION CALCULATIONS

Longford UWWT_ Orthophosphate Load Calculations								
	units	US station (RS26C010857	DS station (RS26C010900	Increased contribution attributed to the Agglomeration and WWTP	Load reduction required in kg/day to reduce to 0.030 mg/l N at d/s monitoring station	UWW primary discharge contribution from 2019 AER Kg/day	Contribution from primary discharge as a % of load reduction required.	Comments
2019 baseline NH4N	mg/l N	0.045	0.043					
Q30	m3/sec	3.74574	4.55196					
Q30	litres/day	323631936	393289344					
Total Orthophosphate	kg/d	14.56	11.79 - 1.89 = 9.9	N/A load reduced downstream.	5.11	0.17	3.2	SWO contribution not assessed no discharge volumes available in the 2019 AER.
UWW primary discharge calculation:								

2019 Annual Mean Ortho-P	mg/l	0.03
2019 Avg Effluent flow	m3/ day	5922
Total WWTP contribution (primary discharge only):	kg/d	0.17

- Orthophosphate values in the CAMLIN_060 are approx. 0.034 mg/l as N and a flow rate of 0.646592 m/3 /sec source: Hydrotool

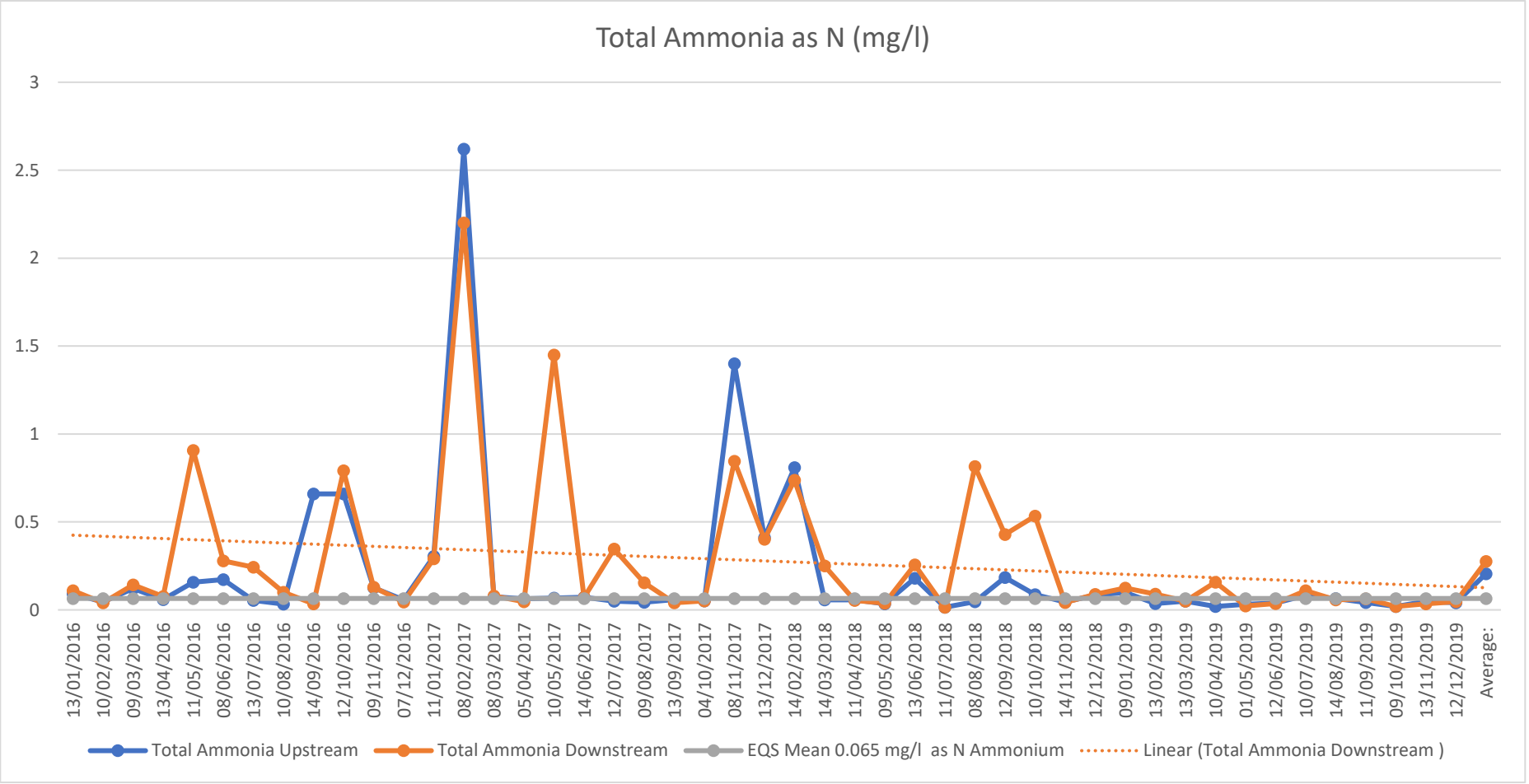
APPENDIX 5 BOD LOAD REDUCTION CALCULATIONS

Longford UWWT_ BOD Load Calculations								
	units	US station (RS26C010857	DS station (RS26C010900	Increased contribution attributed to the Agglomeration and WWTP	Load reduction required in kg/day to reduce to 1.4 mg/l at d/s monitoring station	UWW primary discharge contribution from 2019 AER Kg/day	Contribution from primary discharge as a % of load reduction required.	Comments
2019 baseline BOD	mg/l N	1.31	1.61					
Q30	m3/ sec	3.74574	4.55196					
Q30	litres /day	323631936	393289344					
Total BOD	kg/d	423.9	521 – 78.2 CAMLIN_060 loading of = 442.8	18.8	82 kgl/ day or 30,145 kg/year	14.33	17.7%	SWO contribution not assessed no discharge

								volumes available in the 2019 AER.
UWW primary discharge calculation:								
2019 Annual Mean BOD	mg/l	2.42						
2019 Avg Effluent flow	m3/ day	5,922						
Total WWTP contribution (primary discharge only):	kg/d	14.33 kg/day						

- BOD values in the CAMLIN_060 are approx. 1.4 mg/l and a flow rate of 0.646592 m/3 / sec source: Hydrotool

APPENDIX 6 UPSTREAM AND DOWNSTREAM CONCENTRATIONS FOR TOTAL AMMONIA 2016 TO 2019



APPENDIX 7 HYDROCHEMISTRY AT STONEPARK (ARDAGH RIVER)

Entity Name	Station Name	Sample Purpose	Location	Sample Date	Ammonia as N	BOD	Nitrate as N	Ortho-P as P
					mg/l	*mg/l*	*mg/l*	*mg/l*
CAMLIN_060	Stone Park	River Quality	Easting: 211899.63, Northing: 271550.40	22/01/2020	0.054	1.4	1.2	0.034
CAMLIN_060	Stone Park	River Quality	Easting: 211899.63, Northing: 271550.40	07/07/2020	0.02	1.8	1.8	0.064
CAMLIN_060	Stone Park	River Quality	Easting: 211899.63, Northing: 271550.40	18/11/2020	0.038	1.5	1	0.037
	Average				0.038	1.5	1	0.037

Site	Date	SSIS Score Value Score	Further Information
Connolly Crescent, North of St. Mel's College	13/08/2019	2.4	Probably Impacted - dominated by *chironmous*, *Simuliidae* and *Asellus.*

Stonepark	13/08/2019	4.8	Probably Impacted - dominated by *chironmous, Simuliidae* and *Asellus* Good habitat for fish (reds visible)
Bridge on the R393	13/08/2019	0	Probably Impacted - dominated by *chironmous, Simuliidae* and *Asellus*
Mt Jessop Bridge	13/08/2019	4.8	Probably Impacted - *Simuliidae* and asellus present but at a lower abundance.