Arts
047 71114

Community &
Enterprise
047 30500

County Library
047 51143

County Museum
047 82928

Environment
047 30593

Finance
047 30589

Fire/Building Control
047 30521

Higher Education
Grants
047 30550

Housing Estate
Management
047 30529

Housing Loans/Grants
047 30527

Human Resource
Management
047 30586

Motor Tax
047 81175

Planning
047 30532

Register of Electors
047 30547

Roads
047 30597

Water Services
047 30504

Reg No D0207-01
Monaghan Co Council (Ballybay)
Reg 18(3)(b) Reply 2
Rec'd 25/02/2011
Original

Monaghan
COUNTY COUNCIL
COMHAIRLE CONTAE
MHUINEACHÁIN

24th February, 2011

Administration,
Environmental Licensing Programme,
Office of Climate, Licensing & Resource Use,
Environmental Protection Agency,
Headquarters,
PO Box 3000,
Johnstown Castle Estate,
County Wexford

ENVIRONMENTAL PROTECTION AGENCY
25 FEB 2011

A Chara,

RE: NOTICE IN ACCORDANCE WITH REGULATION 18(3)(b) OF THE WASTE WATER DISCHARGE (AUTHORISATION) REGULATIONS, 2007

Further to your correspondence of the 29th July 2010, please find enclosed the following documentation and accompanying CD ROM relating to the Ballybay application (DO207-01).

- Two hard copies of Further Information Response
- CD-ROM of Further information Response (PDF)

In relation to items 4 and 5 of ***REGULATION 16 COMPLIANCE REQUIREMENTS*** I would comment as follows.

Item 4 - Update of Preliminary Report
Monaghan County Council has not submitted the Preliminary Report for the bundled scheme (Castleblayney, Clones and Ballybay WWTP's and Network) to the DEHLG for their approval.

Approval of the Preliminary Report is contingent of An Bord Pleanala's (ABP) consideration of the proposed expansion of Castleblayney WWTP EIS (currently under consideration by ABP).

Item 5 - Measures to comply with Environmental Objectives (Surface Water) Regulations 2009
Mass balance calculations have been carried out using adjusted background concentrations (see Appendix 3 of further information response). The results are summarized below:

Monaghan County Council, Council Offices, The Glen, Monaghan, Ireland.
Comhairle Contae Mhuineacháin, Oifigí an Chontae, Bóthar an Ghleanna, Muineachán.
Tel.: 00353 47 30500 | Fax: 00353 47 82739 | Email: info@monaghancoco.ie

Parameter	Mass Balance T (mg/l)	Mass Balance T (mg/l) Adjusted background levels for mean EQS	Mass Balance T (mg/l) Adjusted background levels for 95%ile EQS	Status
BOD	**2.24**	**1.98**	**2.3**	Good [< 2.6mg/l (95%ile)]
Total Ammonia	0.397	0.435	0.466	Fails to meet good status [< 0.140mg/l (95%ile)]
Molybdate Reactive Phosphorous	0.158	**0.063**	0.078	Meets good status using mean adjusted levels Just fails to meet good status for 95%ile levels [< 0.075mg/l (95%ile)]

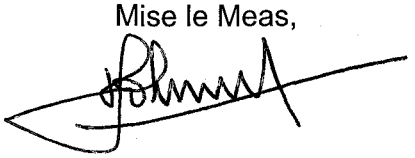
Using adjusted background levels for the 95%ile EQS, the WWTP discharge concentrations for ammonia and MRP will need to be 0.1 mg/l and 0.05 mg/l respectively, to achieve good status in the mass balance calculation at 95%ile flow in the receiving stream.

In order to meet the good status for ammonia and MRP, the Ballybay WWTP will be fully utilised - currently the second aeration tank is not in use because the current load on the WwTW is 43 % of design capacity. Alternatively, increased dissolved oxygen (DO) in the aeration tank may render an emission limit value (ELV) equivalent to "good" status. We will also consider creating an anoxic zone.

It is proposed to bring the aeration tank back into use within the next four months and adjust the process to achieve the required discharge concentrations.

I trust you will find everything in order, however, if you require anything further please let me know.

Mise le Meas,



Mark Johnston

Senior Executive Engineer

Monaghan County Council
Water Services Department
Comhairle Chontae Mhuineacháin
Roinn Seírbíse Úisce

BALLYBAY
WASTEWATER TREATMENT PLANT

Waste Water Discharge License Application

Application Register Number: D0207-01

Regulation 18 (3)(b) Further Information Response

Contents

Attachments

A. Discharge Parameter Concentrations Ballybay 2010
B. Revised Non Technical Summary (February 2011)
C. Mass Balance Calculations

1. Introduction

In accordance with the Waste Water Discharge (Authorisation) Regulations 2007 (S.I. 684 of 2007) Monaghan County Council submitted three Waste Water Discharge Certificates of Authorisation applications to the Environmental Protection Agency (EPA) on 6th November 2008. The Ballybay and Environs agglomoration was included within the three submissions.

The following report has been produced in accordance with the EPA correspondence of 9th August 2010 (Notice in accordance with Regulation 18(3)(b) of the Waste Water Discharge (Authorisation) Regulations 2007) requesting Monaghan County Council to provide further information in accordance with Regulation 18(3)(b) of the regulations.

This submission includes a revised non technical summary as stipulated in the original Waste Water Discharge Certificates of Authorisation application submission.

2. Revised Non-Technical Summary

See attached document.

3. Management of the Site

The Ballybay Waste Water Treatment Plant (WWTP) and its discharge are not directly connected with or necessary to the management of any European site (Natural Heritage Area, NHA, Special Area of Conservation, SAC or Special Protection Area, SPA).

4. Project Description

The WWTP is designed to cater for a population equivalent of 7,238 and is currently accepting effluent flows of approximately 3,135PE. A network of gravity sewers and pumping stations collect and transport waste water from the Ballybay agglomeration to the WwTW located to the south west of the town.

Flows from the combined and foul sewage network drain into the WWTP inlet pumping station. Flows are pumped to the inlet screening & de-gritting works. From there it gravitates through the rest of the works, where it receives secondary treatment by extended aeration followed by settlement before discharging to the receiving water course (the Dromore River). The Dromore River is located in the North-western International River Basin District.

Storm flows are currently directed to one of the aeration basins in the works, where they are held until flow into the plant subsides. They are then reintroduced into the treatment flow. Flows in excess of 5DWF overflow to an adjacent storm wet well. Flows from here are pumped directly to the Dromore river.

The treatment works consists of 1 no. inlet screen with storm overflow to storm tank, flow to full treatment measuring flume, 4 no. primary settlement tanks, 2 no. Rotating Biological Contactors, inter-stage pumping station, 2 no. trickling filters towers, 3 no. final settlement tanks and outlet flow measurement .

There is no SCADA system and no remote monitoring of the plant in place.

5. Characteristics of the Site

There are no SAC, SPA or NHA sites in the vicinity of Ballybay WWTP.

6. Assessment of Significance

Protection of Natural Heritage and National Monuments

The screening methodology used for Ballybay WWTP is in accordance with the Department of the Environment, Heritage and Local Government Circular L8/08, Water Services Investment Programmes – Protection of National Heritage and National Monuments.

Within the circular initial screening in accordance with Appendix 1 (natural heritage) and Appendix 2 (architectural heritage) are required.

7. Appendix 1 Screening (Natural Heritage)

Appendix 1 of Circular L8/08 prescribes 8 questions and a screening flow diagram that are used to determine if a new development requires screening for potential impacts to habitats, flora or fauna. The 8 checklist questions are dealt with below.

1. **Is the development in or on the boundary of a nature conservation site NHA / SAC / SPA?**

No, Ballybay WWTP is not sited in or on the boundary of a nature conservation site. The WWTP discharges into the Dromore River, which then flows through the *Dromore Lakes proposed National Heritage Area* (pNHA). The first lake in the pNHA is located 4.7 km downstream of the WWTP discharge location.

2. **Will nationally protected species be directly impacted? Wildlife Acts (1976 and 2000) Flora Protection order (S.I. 94 of 1999)?**

No. The existing WWTP is not sited within a protected area.

3. **Is the development a surface water discharge or abstraction in the surface water catchments or immediately downstream of a nature conservation site with water dependant qualifying habitats / species?**

Ballybay WWTP discharges into the Dromore River (surface water). This section of the Dromore River is not a designated protected site nor are there any recorded water dependent habitats or species from Annex I or II listed within this section of the surface water course.

4. **Is the development a groundwater discharge or abstraction in the ground water catchment or within 5 km of a nature conservation site with water dependant qualifying habitats / species?**

No. The existing development does not discharge to groundwater or abstract groundwater. The discharge at Ballybay WWTP is to surface water.

5. **Is the development in the surface water or groundwater catchment of salmonid waters?**

No. The receiving water is not a designated salmonid water.

6. **Is the treatment plant in an active or former floodplain or zone of a river, lake, etc?**

No. The treatment plant is not situated in an active or former floodplain.

7. **Is the development a surface water discharge or abstraction to or from marine waters and within 3 km of a marine nature conservation site?**

No. All discharges from the WWTP are to a surface water river course.

8. **Will the project in combination with other projects (existing and proposed) or changes to such projects affect the hydrology or water levels of sites of nature conservation interest or the habitats of protected species?**

The Ballybay WWTP has a treatment capacity of 7238 PE. The current load on the WwTW is approximately 3135PE (43 % of design capacity). There are no plans to extend or combine the existing plant. The WWTP and the discharges from it will have minimal effect on the hydrology or water levels of any surface water courses or bodies.

The WWTP discharges into the Dromore River. The Dromore River flows into a lake system 0.5 km downstream of the WWTP outfall. This system of interconnected lakes stretches for 12km along the Cavan / Monaghan border. The discharge point from the WWTP is 40 km from the Erne River and 50 km from Upper Lough Erne. With an average discharge of 1570 m^3/day (18 l/s) it will have minimal impact on the hydrology or water levels of these nature conservation areas.

8. Appendix 2 Screening (Archaeological Heritage)

Appendix 2 provides an archaeological heritage checklist for Local authorities in which to assess the potential impacts on archaeological material and recorded monuments.

The seven statements provided in appendix 2 are dealt with below.

- **Any scheme that extends within or impinges upon the confines of the "black line" drawn around a monument on the Record of Monuments and Places map.**

Ballybay WWTP does not impinge upon any protected monument sites or areas of archaeological importance.

The closest monument is a ringfort (rath / cashel) in Annaneese townland (MO019-033), located 1.12 km south-west of the WWTP.

The next closest monument is another ringfort (rath / cashel) in Annaneese townland (MO019-034) located 1.25 km south-west of the WWTP.

- **Any scheme that is likely to have an adverse impact on the setting and amenity of a monument on the Record of Monuments and Places map.**

The closest monument to the WWTP is the ringfort (rath / cashel) in Annaneese townland (MO019-033). The WWTP is separated from the monument by the Dromore River, the R190 public road, a drumlin and agricultural land.

Therefore the scheme will not have an adverse impact on the setting and amenity of this monument.

- **Any scheme that may not be in proximity to known monuments but is large in scale.**

Ballybay WWTP is designed to treat effluent from a population equivalent of 7238. The WWTP site comprises 0.82 ha and is below the ordnance datum level of the main town. It is separated from the closest monument by a river, the R190 public road, a drumlin and agricultural land.

- **Any scheme that may be unduly close to archaeological complexes.**

Ballybay WWTP is not unduly close to any known archaeological complexes and does not pose a threat to the archaeological heritage of the area.

- **Any scheme that will impact on rivers, lakes, the inter-tidal zone, the foreshore or any underwater area where historic shipwrecks or other underwater archeological objects may be located.**

The existing WWTP does not impact on any historic shipwrecks or other underwater archaeological objects.

- **Any scheme that requires an Environmental Impact Statement**

The existing scheme does not require an Environmental Impact Statement. The scheme is not located within any designated areas and is not of a large scale.

- **Any scheme that may have an adverse impact on the setting and amenity of any national monument in the ownership or guardianship of the Minister for the Environment, Heritage and Local Government or any national monument in the ownership or guardianship of the local authority or any national monument that is subject to a preservation order.**

The existing scheme does not have any adverse impact on any national monument or any monument that is subject to a preservation order.

9. Screening Conclusion

Given the distance of the WWTP from the pNHA (4.7km) and the standard of treatment currently provided by the WWTP, the main threat to aquatic life within the pNHA is from agricultural runoff.

The average effluent quality from the WWTP (for 2010) shows that the quality of discharge is consistently within the requirements of the Urban Waste Water Directive:

Parameter	Concentration Limits	2010 Average Effluent Quality
BOD_5 (mg/L)	25	2.67
Total Suspended Solids (mg/L)	35	5.11
COD (mg/L)	125	32.11
Total Nitrogen (mg/L N)	20	5.08
Total Phosphorous (mg/L P)	2.0	0.14

The above screening assessment concludes that the presence of the Ballybay WWTP will not impact upon a European Site or on any National Monument. Therefore an Appropriate Assessment is not required.

Monaghan County Council will continue to mitigate the potential impacts to the receiving water by ensuring that sampling and monitoring of the discharges from the WWTP are in accordance with the Urban Waste Water Discharge Regulations.

In accordance with the procedure outlined in DoEHLG Circular L08/08, no significant effects are likely to occur.

Attachments:

A. Discharge Parameter Concentrations Ballybay 2010
B. Revised Non Technical Summary (February 2011)

ATTACHMENT A

DISCHARGE PARAMETER CONCENTRATIONS BALLYBAY 2010

Ballybay WWTP

EntityName	Influent Or Effluent	Date of Sampling	Sample Type (C or G)	BOD mg/l	COD mg/l	TSS mg/l	Total P mg/l P	Ortho P mg/l P	Total N mg/l N	NH3-N mg/l N
Ballybay	Effluent	16/03/2010	C	2	37	2	0.13		30.13	5.57
Ballybay	Effluent	20/05/2010	C	2	32	2	0.11		1.16	0.19
Ballybay	Effluent	09/06/2010	C	2	38	2	0.18		1.61	0.04
Ballybay	Effluent	22/06/2010	C	2	32	2	0.13		0.47	0.35
Ballybay	Effluent	13/07/2010	C	2	21	9	0.11		0.66	0.44
Ballybay	Effluent	29/07/2010	C	2	29	8	0.14		0.27	0.45
Ballybay	Effluent	17/08/2010	C	8	34	6	0.11		1.64	0.56
Ballybay	Effluent	13/10/2010	C	2	34	5	0.12		5.42	0.08
Ballybay	Effluent	30/10/2010	C	2	32	10	0.22		4.4	0.35
			Average:	**2.67**	**32.11**	**5.11**	**0.14**		**5.08**	**0.89**
			Maximum:	**8**	**38**	**10**	**0.22**		**30.13**	**5.57**

ATTACHMENT B

REVISED NON TECHNICAL SUMMARY

Monaghan County Council
Water Services Department
Comhairle Chontae Mhuineacháin
Roinn Seírbíse Úisce

BALLYBAY
WASTEWATER TREATMENT PLANT

Revised Non-technical Summary

Monaghan County Council
County Offices
The Glen
Co. Monaghan

February 2011

NON-TECHNICAL SUMMARY

1. The waste water works and the activities carried out

1.1 Introduction

Ballybay is a small market town in the centre of County Monaghan and is situated on the shores of Lough Major. The town is located 21 km south of Monaghan Town and 120 km North West of Dublin. The current residential population of the town was estimated as 3,135. Today Ballybay serves as a retail and service centre to the agricultural community in the surrounding hinterland. The urban area lies in a relatively flat area surrounded by drumlins, rivers and interglacial lakes.

Employment locally is provided in a food processing plant and a manufacturing industry adjoining the town and in the retail and service sector within the town. Commercial facilities are located predominantly around the centre of town. Institutional facilities in Ballybay include three primary schools and one secondary school.

The drainage catchment in Ballybay includes the main urban area on the banks of Lough Major and extends outwards to service ribbon development along roads leading into the town (with the exception of the R162 to the south). The total area of the drainage catchment is approximately 95 ha.

The WWTP is located to the south west of the town, at Meetinghouse Lane. The WWTP currently occupies an area of approximately 0.4 hectares and designed to cater for 7,238P.E. Ballybay WWTP was built and commissioned in 1983 to provide preliminary and secondary treatment for waste water prior to discharge to the River Dromore. The WWTP operates as an extended aeration plant, preceded by screening and grit removal. Sludge treatment at the WWTP comprises thickening and dewatering. The dewatered sludge is stored on site prior to disposal. Treated effluent from Ballybay Waste Water Treatment Plant (WWTP) discharges to the River Dromore via a single outfall. The river flows into a lake and marshy area approximately 0.5 km downstream of the WWTP outfall. The influent and effluent quality at Ballybay WWTP is monitored by 24 hour flow proportional sampling.

The waste water treatment plant is managed on a part-time basis by a technician and a caretaker. There is no SCADA system and no remote monitoring of the plant in place.

1.2 Summary of Wastewater Treatment Plant Units

Treatment Stage	Element	Description (dimensions, capacities etc)	No of Units
Preliminary	Inlet Pumping Station	2No submersible duty pumps (each rated 30L/s) 2No storm pumps in separate well	2
	Screen	Mechanical course screen (20mm aperture)	1
	Grit removal	Vortex Grit Trap	1
	Flow monitor	Venturi flume at the plant inlet and outlet	1
	Storm water Treatment	Currently directed to one of the Aeration Basins	1
Primary	N/A	N/A	N/A
Secondary	Extended Aeration	Rectangular Aeration Tanks (total capacity = 2,460m3)	2
	Settlement Tank	Rectangular Settlement Tanks (Surface area = 215m2)	2
Tertiary	N/A	N/A	N/A
Ancillary	Phosphorus Removal	Chemical dosing for phosphorous removal	1
Sludge Treatment/Disposal	Thickening	Picket Fence Thickener, achieves 2.5% dry solids (capacity = 306m3)	1
	Dewatering	Single belt press estimated @ 90kg ds/hr, achieves 9.5% ds	
Outfall	Pipe	10m long open ended outfall to Dromore River	1
Power Generation	N/A	N/A	N/A

1.3 Description of Waste water treatment process

Inlet Works and Preliminary Treatment

The inlet flow is pumped up to the inlet works passing through a flume with V-Notch weirplate for flow measurement and then flows to a mechanical bar screen. The screenings are directed to a macerator chamber for maceration and returned to the system for treatment. Grit is automatically removed using a Jones and Attwood Pista grit trap. The grit is air lifted to a grit holding chamber and manually removed from there and disposed of to the Scotch Corner landfill. The inlet flow is sampled by a Contronic Flow Proportional Inlet Sampler. The screen and grit are controlled automatically by level probes.

Secondary Treatment

Following preliminary treatment waste water gravitates to the secondary treatment system. Secondary treatment is provided by an activated sludge treatment system comprising of;

- Two rectangular aeration tanks designed for BOD removal and nitrification
- Two rectangular secondary settlement tanks and a sludge circulation system.

Each aeration tanks has a total capacity of approximately 2,460 m^3, and is fitted with two vertical shaft surface aerators rated at 14.4 kW each. Flow from the aeration tanks gravitates to two rectangular horizontal flow settlement tanks fitted with continuous chain driven scraper mechanisms. Settled sludge gravitates to the nearby pumping station, while scum is removed automatically from the tank surface. A common set of submersible pumps (duty/standby) is used to alternately pump the activated sludge to the aeration tanks or to a picket fence thickener.

Treated effluent which overflows from the secondary settlement tanks gravitates to an on site chamber from where it discharges to the River Dromore, via an open ended outfall.

The treated effluent is measured in a venturi flume at the plant outlet. Twenty-four hour composite samples and grab samples are also routinely taken at this location.

Sludge Treatment

Excess sludge is continually being produced and is removed at regular intervals by pumping to a picket fence thickening tank. Polyelectrolyte is dosed into this line. The sludge is allowed to settle in the thickener and supernatant is drawn off which returns to the sludge return sump for further treatment.

Settled sludge is periodically drawn off from the PFT and pumped into the flocculation chamber. The polyelectrolyte is dosed into the line prior to the chamber.

The flocculated sludge overflows the chamber onto a single belt press and is pressed to a solid sludge cake. The dewatered sludge is stored in a covered skip prior to disposal.

2.0 The sources of emissions from the waste water works

Primary Discharge (PSW1) – Effluent Outfall

Treated effluent from Ballybay Waste Water Treatment Plant (WWTP) discharges to the River Dromore via a single outfall. The river flows into a lake and marshy area approximately 0.5 km downstream of the WWTP outfall. The discharge pipe is an open discharge 530mm diameter pipe.

Refer to Drawing 10, Attachment C2.

Storm Water Overflows (SW2) – Castleblayney Road CSO

The Castleblayney Rd combined sewer overflow is located outside No 14 Castleblayney Rd. The catchment upstream of the overflow consists of the Castleblayney Rd (including the Whyleys Hill and Folly Court pumping stations), and further properties behind Main St, including Church Place and the livestock mart.

The overflow consists of a single broad-crested concrete wall weir set at an approximate height of 300 mm above the invert of the incoming 300mm sewer. Excess storm flows go over the weir and through a coarse screen into a 600mm storm sewer, which eventually discharges into Lough Major.

Refer to Drawing 11, Attachment C2.

Storm Water Overflows (SW3) – Corrybrannan Bridge CSO

The Corrybrannan Bridge combined sewer overflow on the north bank of the Dromore River where it crosses under Corrybrannan Bridge. The catchment upstream of the overflow consists of the Carrickmacross Rd and Loch Mor estate.

The overflow consists of a single sided weir set at a height of 200 mm above the invert of the incoming 375mm sewer. Excess storm flows go over the weir and directly into the Dromore River.

Refer to Drawing 12, Attachment C2.

Storm Water Overflows (SW4) – WWTP Inlet Pumping Station (storm wet well)

Flows in excess of 5DWF overflow to an adjacent storm wet well. Flows from here are pumped directly to the Dromore river.

Refer to Drawing 10, Attachment C2.

Existing Sewerage Network Overview

Ballybay catchment is drained by a combination of gravity sewers and five pumping stations to the wastewater treatment plant, with final effluent discharging into the Dromore River. The network is largely combined and only recent developments have separate foul and storm systems.

3.0 The nature and quantities of emissions from the waste water works into the receiving aqueous environment

The existing plant has a design capacity of 7,238 pe and a design effluent quality (to the primary discharge point) as follows;

Parameter	Concentration
BOD_5 (mg/L)	25
Total Suspended Solids (mg/L)	35
COD (mg/L)	125
Total Nitrogen (mg/L N)	20
Total Phosphorus (mg/L P)	2.0

The Ballybay Wastewater Treatment Works complies with the requirements of the Urban Waste Water Directive. No significant effects have been identified.

Section 4.4.1 of the Department of the Environment, Heritage and Local Government, National Urban Waste Water Study, Ballybay Catchment Report states that:

"Routine monitoring data has shown that the WWTP has consistently discharged treated effluent in compliance with the discharge standards specified in the Urban Waste Water Treatment Regulations, 2001 (i.e., < 25 mg/l BOD, < 35 mg/l suspended solids and 2 mg/l Total Phosphorus concentration). Treated effluent samples in 2001 had average concentrations of 12 mg/l BOD, less than 9 mg/l suspended solids and less than 1.0 mg/l Ortho-Phosphate.
Historically there has been a significant increase in the concentrations of nitrates in the final effluent being discharged, reaching as high as 61 mg/l reported in March 2001. This is attributed to the treatment of imported leachate from Scotch Corner landfill. Since February 2002 80% of the leachate from Scotch Corner landfill has been treated at Monaghan WWTP and this has lead to a reduction in nitrate concentrations being discharged in the treated effluent from Ballybay WWTP."

4.0 Identification of significant effects of the emissions on the environment

The only significant emission from the wastewater treatment plant is the effluent to the Lough Major. The effect of this has been examined in terms of the waste assimilative capacity of the Dromore River in terms of BOD_5, suspended solids, phosphorus, ammonia and oxidised nitrogen. In general the current effluent limits are not within the waste assimilative capacity of the river, please see attachment F1 for further information. However, an effluent limit of BOD of 16mg/l and phosphorous level of 1.0mg/l is currently being achieved. These levels are less then the waste assimilative capacity of the river.

Section 4.4.3 (Meeting the Standards) of the Department of the Environment, Heritage and Local Government, National Urban Waste Water Study, Ballybay Catchment Report states that:

"Ballybay WWTP currently provides an adequate level of waste water treatment for compliance with the Urban Waste Water Treatment Regulations (S.I. No. 254 of 2001), i.e. secondary treatment for discharges to freshwaters from between 2,000 and 10,000 pe by 31st December 2005. The Dromore River is not designated sensitive under the UWWTR and the provision of nutrient reduction is not a legislative requirement under these regulations."

5.0 The proposed technology and other techniques for preventing or reducing emissions/pollution from the waste water works

The wastewater treatment plant in Ballybay was commissioned in 1983. As stated in the national Urban Waste Water study catchment report for Ballybay, it is considered to be providing a suitable level of treatment to prevent pollution of Lough Major.

However, as outlined in the draft Preliminary report submitted Monaghan County Council the following measures are proposed to further reduce and prevent emissions/pollution from the works (refer to drawing 03, Attachment B2):

- ***Stormwater Tank*** - a stormwater tank with 2 hours capacity for overflows at peak flows (8 DWF)
- ***Inlet Works*** - complete replacement of all mechanical and electrical equipment and instrumentation
- ***Secondary Treatment*** - A complete replacement of all mechanical and electrical equipment and instrumentation
- ***Aeration Tanks*** - the existing surface aerators in the aeration tanks to be replaced with a diffused air aeration system
- ***Settlement Tanks*** - the scraper bridges and scum removal equipment to be completely replaced
- ***Sludge Return / Sludge Waste*** - complete replacement of the mechanical, electrical and instrumentation equipment including replacement of actuated valves.
- ***Nutrient Reduction*** - anoxic and anaerobic zone be provided within the existing aeration tanks to provide for biological phosphorus and nitrogen reduction.
- A chemical dosing facility for phosphorus removal should also be provided as a back-up to ensure that the full level of phosphorus removal can be achieved at all times.
- ***Tertiary BOD/Suspended Solids Reduction*** - A sand filter for the reduction of BOD and suspended solids following secondary treatment to

provide a reliable level of treatment of the effluent prior to discharge to the receiving waters.

- ***Sludge Treatment*** **-** A separate sludge acceptance / leachate acceptance facility for any imports of sludge and/or Leachate.
- A new sludge dewatering building with a centrifuge and ancillary equipment is recommended.
- Administration and control building refurbishment
- Provision of air blower room (within existing sludge building)
- Odour control plant
- Upgrade existing site paths and roads
- Upgrade existing walkways, handrailing and decking
- Upgrade existing site cable ducts and pipework
- New main and sludge dewatering control panels
- New telemetry and SCADA system

6.0 Measures planned to monitor emissions into the environment

The inlet flow is sampled by a Contronic Flow Proportional Inlet Sampler.
The screen and grit are controlled automatically by level probes.
The treated effluent flow is measured in a venturi flume at the plant outlet.
Twenty-four hour composite samples and grab samples are also routinely taken at this location.

Flowmeters are provided at the wastewater treatment plant to monitor the process and the emissions to the environment. The flowmeters provided are as follows:

- Flow monitoring using level sensor in inlet flume chamber
- Flowmeter for the sludge return flow.
- Flowmeter and recording equipment for flow from Effluent Pumping Station.

The following process instrumentation is also provided to monitor the process and to ensure there is no overflows of pumping stations and the activated sludge system is working effectively:-

(i) Dissolved oxygen monitoring in each aeration tank.
(ii) Ultrasonic level measurement in all pump sumps

Monaghan County Council currently carry out monthly monitoring of the final effluent from the wastewater treatment plant in addition to ongoing monitoring carried out in Dromore river and Lough Major to monitor the water quality.

ATTACHMENT C

Mass balance calculations:

1. **Sampled background concentrations in receiving waters**
2. **Adjusted background concentrations (95%ile)**
3. **Adjusted background concentrations (mean)**
4. **Adjusted concentrations at discharge & adjusted background concentrations (95%ile) to achieve "Good" status**

BALLYBAY WWTP - Dromore River

BOD

Mass balance= T= FC+fc/F+f

where

T= resultant concentration downstream due to the discharge (mg/l)	2.240	mg/l
F= 95%ile flow in receiving water (m3/s)	0.031	
C=mean background concentration in receiving water (mg/l)	1.99	
f= maximum discharge flow (m3/s)	0.018	
c= maximum concentration in discharge (mg/l)	2.67	

BOD	**High Status: 1.3mg/l (mean) or 2.2mg/l (95%ile)**	
BOD	**Good Status: 1.5mg/l (mean) or 2.6mg/l (95%ile)**	**2.24**

Ammonia

Mass balance= T= FC+fc/F+f

where

T= resultant concentration due to the discharge (mg/l)	0.397
F= 95%ile flow in receiving water (m3/s)	0.031
C=mean background concentration in receiving water (mg/l)	0.11
f= maximum discharge flow (m3/s)	0.018
c= maximum concentration in discharge (mg/l)	0.89

Ans 0.397

Ammonia	High Status:< 0.040 mg/l (mean) or < 0.090 mg/l (95%ile)	European communities environmental
Ammonia	Good Status < 0.065mg/l (mean) or < 0.140mg/l (95%ile)	

MRP

Mass balance= T= FC+fc/F+f

where

T= resultant concentration due to the discharge (mg/l)	0.158
F= 95%ile flow in receiving water (m3/s)	0.031
C=mean background concentration in receiving water (mg/l)	0.19
f= maximum discharge flow (m3/s)	0.018
c= maximum concentration in discharge (mg/l)	0.103

Ans 0.158

Molybdate Reactive Phosphorus (MRP) Rivers Freshwater)	High Status < 0.025mg/l (mean) <0.045 mg/l (95%ile)	European Communities environmental Objectives (Surface waters) regulations 2009	Essential means "AND" not one or other
	Good Status <0.035 mg/l (mean) < 0.075mg/l (95%ile)		

BALLYBAY WWTP - Dromore River - adjusted background concentrations (95%ile) & maximum effluent flow

BOD

Mass balance= T= FC+fc/F+f

where

T= resultant concentration downstream due to the discharge (mg/l)	2.300	mg/l
F= 95%ile flow in receiving water (m3/s)	0.031	
C=mean background concentration in receiving water (mg/l)	1.99	
f= maximum discharge flow (m3/s)	0.026	Maximum discharge flow
c= maximum concentration in discharge (mg/l)	2.67	

BOD	**High Status: 1.3mg/l (mean) or 2.2mg/l (95%ile)**		
BOD	**Good Status: 1.5mg/l (mean) or 2.6mg/l (95%ile)**	**2.3**	Good status

Ammonia

Mass balance= T= FC+fc/F+f

where

T= resultant concentration due to the discharge (mg/l)	0.466	
F= 95%ile flow in receiving water (m3/s)	0.031	
C=mean background concentration in receiving water (mg/l)	0.11	adjusted background concentration
f= maximum discharge flow (m3/s)	0.026	Maximum discharge flow
c= maximum concentration in discharge (mg/l)	0.89	

Ans 0.466 too high

European communities environmental Objectives (Surface Waters) Regulations 2009

Ammonia	High Status:< 0.040 mg/l (mean) or < 0.090 mg/l (95%ile)
Ammonia	Good Status < 0.065mg/l (mean) or < 0.140mg/l (95%ile)

MRP

Mass balance= T= FC+fc/F+f

where

T= resultant concentration due to the discharge (mg/l)	0.078	
F= 95%ile flow in receiving water (m3/s)	0.031	
C=mean background concentration in receiving water (mg/l)	0.0575	adjusted background concentration
f= maximum discharge flow (m3/s)	0.026	Maximum discharge flow
c= maximum concentration in discharge (mg/l)	0.103	

Ans 0.078 just too high

Molybdate Reactive Phosphorus (MRP) Rivers Freshwater)	High Status < 0.025mg/l (mean) <0.045 mg/l (95%ile)	European Communities environmental Objectives (Surface waters) regulations 2009	Essential means "AND" not one or other
	Good Status <0.035 mg/l (mean) < 0.075mg/l (95%ile)		

BALLYBAY WWTP - Dromore River - adjusted background concentrations (mean) & maximum effluent flow

BOD

Mass balance= T= FC+fc/F+f

where

T= resultant concentration downstream due to the discharge (mg/l)	1.979	mg/l
F= 95%ile flow in receiving water (m3/s)	0.031	
C=mean background concentration in receiving water (mg/l)	1.4	
f= maximum discharge flow (m3/s)	0.026	Maximum discharge flow
c= maximum concentration in discharge (mg/l)	2.67	

BOD	**High Status: 1.3mg/l (mean) or 2.2mg/l (95%ile)**		
BOD	**Good Status: 1.5mg/l (mean) or 2.6mg/l (95%ile)**	**1.98**	Good status

Ammonia

Mass balance= T= FC+fc/F+f

where

T= resultant concentration due to the discharge (mg/l)	0.435	
F= 95%ile flow in receiving water (m3/s)	0.031	
C=mean background concentration in receiving water (mg/l)	0.0525	adjusted background concentration
f= maximum discharge flow (m3/s)	0.026	Maximum discharge flow
c= maximum concentration in discharge (mg/l)	0.89	

Ans 0.435 too high

Ammonia	High Status:< 0.040 mg/l (mean) or < 0.090 mg/l (95%ile)
Ammonia	Good Status < 0.065mg/l (mean) or < 0.140mg/l (95%ile)

MRP

Mass balance= T= FC+fc/F+f

where

T= resultant concentration due to the discharge (mg/l)	0.063	
F= 95%ile flow in receiving water (m3/s)	0.031	
C=mean background concentration in receiving water (mg/l)	0.03	adjusted background concentration
f= maximum discharge flow (m3/s)	0.026	Maximum discharge flow
c= maximum concentration in discharge (mg/l)	0.103	

Ans 0.063 good status

Molybdate Reactive Phosphorus (MRP) Rivers Freshwater)	High Status < 0.025mg/l (mean) <0.045 mg/l (95%ile)	European Communities environmental Objectives (Surface waters) regulations 2009	Essential means "AND" not one or other
	Good Status <0.035 mg/l (mean) < 0.075mg/l (95%ile)		

BALLYBAY WWTP - Dromore River - adjusted c value & adjusted background level to achieve good status

BOD

Mass balance= T= FC+fc/F+f

where

T= resultant concentration downstream due to the discharge (mg/l)	2.240	mg/l
F= 95%ile flow in receiving water (m3/s)	0.031	
C=mean background concentration in receiving water (mg/l)	1.99	
f= maximum discharge flow (m3/s)	0.018	
c= maximum concentration in discharge (mg/l)	2.67	

BOD	**High Status: 1.3mg/l (mean) or 2.2mg/l (95%ile)**	
BOD	**Good Status: 1.5mg/l (mean) or 2.6mg/l (95%ile)**	**2.24**

Ammonia

Mass balance= T= FC+fc/F+f

where

T= resultant concentration due to the discharge (mg/l)	0.106	
F= 95%ile flow in receiving water (m3/s)	0.031	
C=mean background concentration in receiving water (mg/l)	0.11	
f= maximum discharge flow (m3/s)	0.018	
c= maximum concentration in discharge (mg/l)	0.1	

Ans 0.106

Ammonia	High Status:< 0.040 mg/l (mean) or < 0.090 mg/l (95%ile)
Ammonia	Good Status < 0.065mg/l (mean) or < 0.140mg/l (95%ile)

MRP

Mass balance= T= FC+fc/F+f

where

T= resultant concentration due to the discharge (mg/l)	0.055	
F= 95%ile flow in receiving water (m3/s)	0.031	
C=mean background concentration in receiving water (mg/l)	0.0575	
f= maximum discharge flow (m3/s)	0.018	
c= maximum concentration in discharge (mg/l)	0.05	

Ans 0.055

Molybdate Reactive Phosphorus (MRP) Rivers Freshwater)	High Status < 0.025mg/l (mean) <0.045 mg/l (95%ile)	European Communities environmental Objectives (Surface waters) regulations 2009	Essential means "AND" not one or other
	Good Status <0.035 mg/l (mean) < 0.075mg/l (95%ile)		