BIOLOGICAL WATER QUALITY MONITORING OF THE RIVER GREESE IN THE VICINITY OF GLANBIA IRELAND FACILITY, BALLITORE, CO. KILDARE

September 2021

REPORT PREPARED FOR FITZ SCIENTIFIC

by

Bill Quirke BSc, MSc, MCIEEM &

Helena Twomey BA(Mod), PhD

Conservation Services, Tullaha, Glenflesk, Killarney, Co. Kerry
Tel/Fax 064 6630130 e-mail cs@conservation-services.ie

Client	Fitz Scientific
Project	Biological monitoring of water quality of the River Greese in the vicinity of Glanbia Ireland facility, Ballitore, Co. Kildare
Report No.	21103/F
Date	30/09/21
Status	Final
Prepared by	Helena Twomey BA(Mod), PhD
Reviewed by	Bill Quirke BSc, MSc, MCIEEM

CONTENTS

1 INTRODUCTION

Conservation Services, Ecological & Environmental Consultants have been commissioned by Fitz Scientific to carry out biological sampling and water quality assessment in accordance with EPA Q-rating methodology at two locations on the River Greese upstream and downstream of the Glanbia Ireland facility, Ballitore, Co. Kildare.

Sampling was carried out on 7th September 2021.

2 METHODOLOGY

2.1 SITE LOCATIONS

Biological sampling and water quality assessment was carried out at Site SW1A, which is located upstream of the facility, and at Site SW3, which is downstream of the facility. Grid references were recorded at all sites using a GPS. Locations are shown in Fig. 1.

SITE	GRID REFERENCE (Irish Grid)
SW1A	S 79625 96272
SW3	S 79681 95938

2.2 HABITAT ASSESSMENT

Habitat assessment was carried out at each of the sites selected for biological water quality assessment. These sites were assessed in terms of:

- Stream width and depth
- Substrate type, listing substrate fractions in order of dominance, i.e. large rocks, cobble, gravel, sand, mud etc.
- Flow type, listing percentage of riffle, glide and pool in the sampling area
- Instream vegetation, listing plant species occurring and their percentage coverage of the stream bottom at the sampling site
- Dominant bankside vegetation, listing the main species overhanging the stream

- Estimated summer cover by bankside vegetation, giving percentage shade of the sampling site

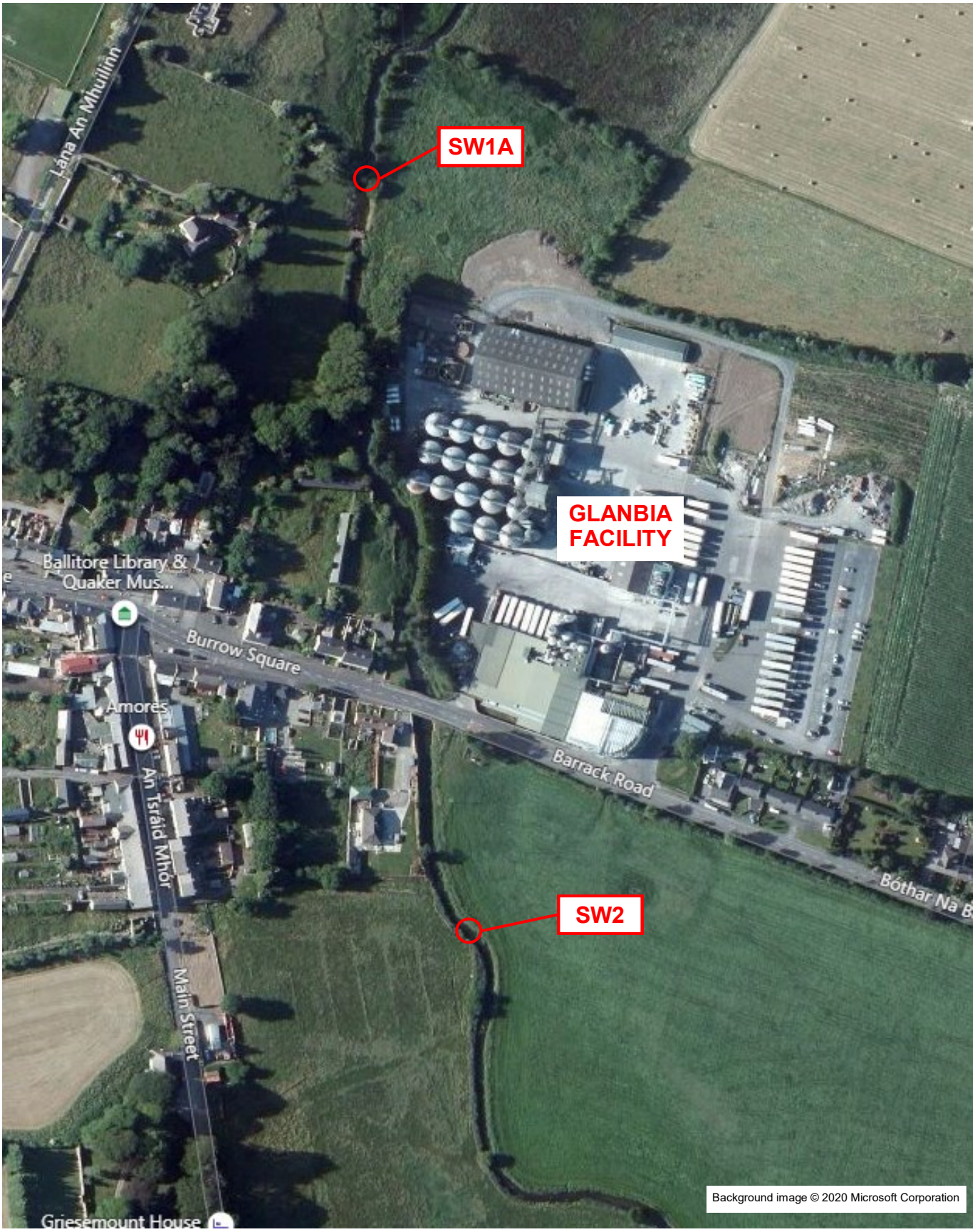
2.3 INVERTEBRATE SAMPLING AND WATER QUALITY ASSESSMENT

A kick and stone wash invertebrate sample was taken at each site (ISO 7828:1985) using standard methodology employed by EPA. Each sample was retained in a large plastic bag at the sampling site. Sample processing and preservation was carried out under laboratory conditions within 24 hours of sampling. Mud was removed from each sample by sieving under running water through a 500µ sieve. Sieved samples were then sorted for 30 minutes in a white plastic sorting tray under a bench lamp (ISO 5667-3:1994) and if necessary using a magnifying lens. Macroinvertebrates were stored in 70% alcohol. Preserved invertebrates were identified to the level required for the EPA Q-rating method (McGarrigle *et al*, 2002) using high-power and low-power binocular microscopes when necessary. The preserved samples were archived for future examination or verification. Based on the relative abundance of indicator species, a biotic index (Q-rating) was determined for each site in accordance with the biological assessment procedure used by the Environmental Protection Agency (McGarrigle *et al*, 2002) and more detailed unpublished methodology (McGarrigle, Clabby and Lucey pers. comm.)

Biotic Index	Water Framework Directive Ecological Quality	Quality Status
Q5	High	Unpolluted Waters
Q4-5	High	
Q4	Good	
Q3-4	Moderate	Slightly Polluted Waters
Q3	Poor	Moderately Polluted Waters
Q2-3	Poor	
Q2	Bad	Seriously Polluted Waters
Q1-2	Bad	
Q1	Bad	

FIG. 1 LOCATION OF BIOLOGICAL ASSESSMENT SITES

Locations shown are approximate; for exact locations, see Grid References in text



3 RESULTS

Habitat at sites is tabulated in Appendix 1.

3.1 SITE SW1A

The macroinvertebrate fauna recorded at the site merits a Q-rating of Q3-4 indicating slightly polluted conditions and Moderate ecological quality.

INDICATOR GROUP	TAXON	Number 2021
Group A - Very Pollution Sensitive	*Isoperla grammatica*	1
	Heptageniidae (small/damaged)	3
	Rhithrogena sp.	1
Group B - Moderately Pollution Sensitive	*Baetis muticus*	10
	Agapetus sp.	33
	Goeridae	23
	Odontocerum albicorne	1
	Sericostoma personatum	2
Group C - Moderately Pollution Tolerant	*Ancylus fluviatilis*	3
	Bathyomphalos contortus	1
	Gammarus duebeni	c.270
	Hydracarina	2
	Baetis rhodani	16
	Caenis sp.	1
	Serratella ignita	4
	Hydropsyche sp.	1
	Rhyacophila sp.	3
	Elmidae	15
	Gyrinidae	1
	Ceratopogonidae	1
	Simuliidae	21
	Tipulidae	1
Group D - Very Pollution Tolerant	Sphaeriidae	2
	Asellus aquaticus	1
Group E - Most Pollution Tolerant	None recorded	
Not assigned to an indicator group	Lumbricidae	1
	Stylodrilus sp.	7

3.2 SITE SW3

The macroinvertebrate fauna recorded at the site merits a Q-rating of Q3-4 indicating slightly polluted conditions and Moderate ecological quality.

INDICATOR GROUP	TAXON	Number 2021
Group A - Very Pollution Sensitive	Heptageniidae (small/damaged)	1
	Heptagenia sp.	1
	Rhithrogena sp.	1
Group B - Moderately Pollution Sensitive	*Baetis muticus*	13
	Agapetus sp.	168
	Goeridae	21
	Limnephilidae	1
	Sericostoma personatum	1
Group C - Moderately Pollution Tolerant	*Ancylus fluviatilis*	1
	Potamopyrgus antipodarum	4
	Gammarus duebeni	162
	Hydracarina	5
	Baetis rhodani	11
	Serratella ignita	7
	Hydropsyche sp.	1
	Elmidae	13
	Ceratopogonidae	1
	Pediciidae	10
	Simuliidae	25
	Tipulidae	1
Group D - Very Pollution Tolerant	*Glossiphonia complanata*	2
	Sphaeriidae	8
	Asellus aquaticus	4
Group E - Most Pollution Tolerant	Tubificidae	1
Not assigned to an indicator group	Lumbricidae	1
	Stylodrilus sp.	40
	Lepidoptera	2

4 SUMMARY OF Q-RATINGS

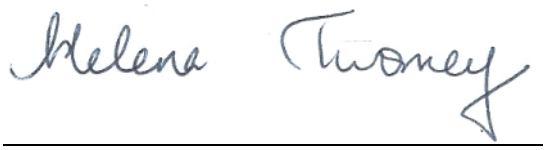
	Upstream of Glanbia Facility		Downstream of Glanbia Facility
	Site SW1	**Site SW1A**	**Site SW3**
Aug. 2008	Q3-4	-	Q3-4
June 2009	Q3	-	Q3-4
June 2010	Q3	-	Q3-4
June 2011	Q3	-	Q3
June 2012	Q3	-	Q3
July 2013	Q3	-	Q3
June 2014	Q3	-	Q3
June 2015	Q3	-	Q3
June 2016	Q3	-	Q4
Sept. 2017	Q3	-	Q4
June 2018	Q4	-	Q4
June 2019	Q3-4	-	Q3-4
Sept. 2020	-	Q3-4	Q3-4
Sept. 2021	-	Q3-4	Q3-4

Data for Sites SW1 & SW3 2008 – 2019 from TMS Environment (2019)

5 CONCLUSIONS

A rating of Q3-4, indicating slightly polluted conditions, was recorded at both Site SW1A upstream of the Glanbia Ireland Ballitore facility and Site SW2 downstream of the facility. The 2021 biological data contain no evidence of an impact on water quality in the River Greese from the Glanbia facility.

Signed on behalf of Conservation Services



Helena Twomey BA (Mod.) PhD

30 September 2021

6 REFERENCES

McGarrigle, M. et al (2002) Water Quality in Ireland 1998-2000. EPA.

TMS Environment (2019) Biological Assessment of Surface Water Quality for Glanbia Foods Society Ltd Ballitore Co.Kildare

APPENDIX 1

HABITAT ASSESSMENT AT SAMPLING SITES

SITE SW1A

Site Location	u/s footbridge
Grid Reference	S 79625 96272
Site Photograph	
Width (m)	8
Depth (cm)	15-20
Substrate (in order of dominance)	Gravel, Sand
Flow Type	Riffle 10% Glide 90%
Instream Vegetation	Filamentous algae 5% *Ranunculus penicillatus subsp. penicillatus* 20% *Nasturtium officinale* agg. 10% *Veronica anagallis-aquatica/catenata* 5% *Phalaris arundinacea* 5%
Dominant Bankside Vegetation	Hawthorn, *Phalaris*
Summer Shade of Stream by Bankside Vegetation	5%
Salmonid Adult Habitat	Fair
Salmonid Nursery Habitat	Fair - Good
Salmonid Spawning Habitat	Fair
Lamprey Nursery Habitat	Fair - Good

Lamprey Spawning Habitat	Fair
Crayfish Habitat	Fair - Good

SITE SW3

Site Location	c.100m d/s bridge
Grid Reference	S 79681 95938
Site Photograph	
Width (m)	7
Depth (cm)	25 - 40
Substrate (in order of dominance)	Gravel, Sand, Silt
Flow Type	Glide 100%
Instream Vegetation	*Ranunculus penicillatus subsp. penicillatus* 30% *Veronica anagallis-aquatica/catenata* <5% *Glyceria fluitans* agg. 10% *Apium nodiflorum* 10% *Nasturtium officinale* agg. 5% *Callitriche sp*. <5% *Phalaris arundinacea* <5% *Lemna minor* <1% *Oenanthe fluviatilis* <1%
Dominant Bankside Vegetation	*Phalaris, Apium*, Watercress
Summer Shade of Stream by Bankside Vegetation	<5%
Salmonid Adult Habitat	Good - Fair
Salmonid Nursery Habitat	Poor - Fair

Salmonid Spawning Habitat	Fair - Poor
Lamprey Nursery Habitat	Fair
Lamprey Spawning Habitat	Poor - Fair
Crayfish Habitat	Fair - Good