Rowan

Nutrient Management Plan 2023



Client: Western Brand (P0831-02)

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Report Sign Off

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Executive Summary

Rowan Engineering Consultants (Rowan) were requested to provide a Nutrient Management Plan (NMP) for the landspreading of WWTP Sludge from Western Brand on the following landbanks:

Summary of Conclusions

This conclusion is based on the statutory requirements set out in S.I. No. 605 of 2017, and on soil and organic material analysis.

Western Brand expect to generate the following quantities of organic wastes during 2023:

- 4,500MT of WWTP Sludge

In summary the landbanks have been mapped and soil sampled in 2018 & 2019. Where soil samples have not been completed in the previous 4 years, it will be assumed that the soils are Phosphorus Index 3 in accordance with Part 3, 16 (2) (a) of SI 605 of 2017, unless previous analysis indicated Phosphorus Index 4.

Landbanks with a Phosphorus Index of 4 and/or landbanks which have a vulnerability rating of Extreme shall be omitted from landspreading (unless it was found the consistent depth of combined soil and subsoil was greater than 1 meter) and therefore, the actual useable area of the landbanks may be significantly less than the usable area listed on the mapping. Also, in some instances, a maximum volumetric loading of 300m^3/MT (based on 6 No. applications during the open season) shall be applied on the landspreading on landbanks in accordance with S.I. No. 605 of 2017.

A summary of the NMP for 2023 is provided below:

Summary	NMP 2023 Usable Area (ha)	NMP 2023 Capacity MT	Total Volume Produced by Western Brand MT/Yr.	Land Capacity
WWTP Sludge	343.5ha	6,922	4,500	154%

1. Introduction

1.1 Background

The Nutrient Management Plan (NMP) 2023 for Western Brand has been prepared to comply with the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017 (S.I. No. 605 of 2017).

Under the terms of Western Brand Industrial Emissions (IE) Licence (P0831-02) Condition 8.13 states:

"All wastewater treatment sludges arising from the treatment of waste waters on-site shall be suitably contained, covered and stored in a designated impervious area while awaiting transport off-site to an appropriate treatment facility. Any liquid run-off arising shall be diverted to the WWTP".

This NMP relates solely for the management of the WWTP Sludge generated at Western Brand.

The contents of this NMP have been updated to reflect the EPA circular issued on 6th January 2021 entitled "Changes to information required in Nutrient Management Plans submitted to the EPA".

Gannon Transport & Environmental Services Ltd have informed customer farmers of the information being provided within this NMP to the EPA and a copy of this NMP has been made available to all relevant customer farmers to view.

1.2 NMP Methodology

The NMP has been prepared by Ian Douglas BSc, MSc of Rowan Engineering Consultants Ltd in accordance with:

- *S.I. No. 605 of 2017– 'European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017'.*
- *'Explanatory Handbook for Good Agricultural Practice for the Protection of Waters Regulations 2014'.*

2. Storage and Landspreading

2.1 Storage

All organic WWTP Sludge will be stored on-site at Western Brand or removed offsite to Western Brand's off-site storage, in concrete pits. This area has a capacity of **c.2,650 MT** for WWTP Sludge.

In accordance with the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017 (S.I. No. 605 of 2017) landspreading may not occur from 8th October to 15th January and it is recommended to have at minimum 19 weeks storage capacity. Approximately 1,646MT of sludge is produced over 19 weeks by Western Brand. As a result, this facility has 161% of the storage capacity required.

2.2 Land-Spreading and Cultivation

All sludge will be spread on this land bank by Gannon Transport & Environmental Services Ltd (Waste Collection Permit Number: NWCPO 17-1200-02) in accordance with this NMP, the Gannon Transport & Environmental Services Ltd Code of Practice for land-spreading (see below) and the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017 (S.I. No. 605 of 2017).

2.3 Gannon Transport & Environmental Services Ltd Code of Practice for Landspreading

Spreading shall not take place:

- On wet or waterlogged ground
- On frozen or snow-covered ground
- On exposed bedrock or outcropping.
- Where surface gradients are excessive (preferably less than 18% (1:5).
- On fields that display cracks over pipe or mole drainage systems.
- From 8th October to 15th January unless a derogation is agreed.
- Outside daylight hours.

Loadings:

- Regardless of the dilution factor, the maximum hydraulic loading per single application shall not shall exceed 50m^3 per hectare every 42 days.

Organic Waste application shall be in accordance with the following guidelines:

- No application when the risk of causing odour nuisance to the public is greatest, e.g. Sundays or public holidays.
- No application during meteorological conditions which give rise to odour nuisance.
- No application where significant rain is forecast within 48 hours.

Buffer Zones for Land-spreading of Organic Wastes

Area	Buffer Zone
Sensitive buildings (hospitals, schools and churches)	200m
Dwelling houses	50m
Karst features	15m
Lakes	20m
Rivers	20m
Surface watercourses	10m
Streams/drains	5m
Public Roads	5m
Domestic wells	25m
Public water supplies supplying 10m^3 or more or serving 50 or more persons.	100m
Public water supplies supplying 100m^3 or more or serving 500 or more persons.	200m

3. Analysis of Sludge

4.1 Nitrogen and Phosphorus

Western Brand's WWTP Sludge was sampled for Nitrogen and Phosphorus in October 2022. The samples were taken on 26/10/2022 and delivered to CLS. (See laboratory certificates in Appendix B). A summary of the WWTP Sludge analysis is provided in the table below.

Table 1: WWTP Sludge Analysis

Sample	Nitrogen Kg/MT	Phosphorus Kg/MT	% DS
WWTP Sludge	0.34	0.98	5.1%

In order to determine the Nitrogen & Phosphorus content in the WWTP Sludge samples in kg/m^3, the following formula was used:

Nitrogen/Phosphorus mg/kg/1000 = kg/m^3

Example WWTP Sludge Nitrogen – *10,500/1000 = 10.5kg/MT*

4.2 Oils, Fats and Greases

Oils, fats and greases above 4% have been demonstrated to be detrimental to plant growth in field experiments undertaken by UK Environmental Consultants, ADAS. The fat compounds coat soil particles and effectively waterproof the particles preventing plant roots extracting moisture, resulting in stunting or die-back. They may also block soil pores, disrupting oxygen movement through the soil profile, potentially leading to anaerobic conditions.

The following table details the Oils, Fats and Greases content within the WWTP Sludge at Western Brand.

Table 2: Oils, Fats & Greases Details

Sample	Date	OFG (mg/l)	% Concentration
WWTP Sludge	26/10/2022	3518	3.5%

As can be seen in the above table, all the WWTP Sludge samples have concentrations of OFG less than 4%. Therefore, it can be it is suitable for landspreading.

4. Nutrient Management Plan (NMP)

4.1 Introduction

This NMP 2023 was prepared to promote the efficient use of nutrients being applied to the soil without causing any adverse environmental impact and also to promote an optimum soil mineral balance in order to optimise crop production efficiency in terms of yield and output.

The NMP was prepared in compliance with the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017 (S.I. No. 605 of 2017). We have assumed that 100% of the phosphorus is available to the crops.

4.2 On Farm Slurry

The following stocking rate will be applied to each farm:

- [redacted]

The table below outlines the total nitrogen and phosphorus produced by the livestock.

Table 4-1. On Farm Slurry

Farmer	No. Animals	Type	% on Farm	Volume m^3/yr/ animal	Volume Total m^3/year	N kg/yr/ animal	P kg/yr/ animal	Total N kg/yr	Total P kg/yr	Total N ha/yr	Total P ha/yr
[redacted]			50%	1.56	234.00	6	1	900	150	18.75	3.13
					0.00			0	0	0.00	0.00
					0.00			0	0	0.00	0.00
					0.00			0	0	0.00	2.77
					0.00			0	0	0.00	0.00
					0.00			0	0	0.00	0.00
					0.00			0	0	0.00	0.00
					0.00			0	0	0.00	0.00
			50%	17.16	171.60	57	8	570	80	51.82	7.27
			50%	17.16	171.60	57	8	570	80	32.57	4.57
			50%	17.16	171.60	57	8	570	80	20.36	2.86
Total:				35.88				2,040	310	123	21

Farmer	No. Animals	Type	% on Farm	Volume m^3/yr/ animal	Volume Total m^3/year	N kg/yr/ animal	P kg/yr/ animal	Total N kg/yr	Total P kg/yr	Total N ha/yr	Total P ha/yr
[redacted]	[redacted]		100	13.52	405.6	57	8	1710	240	13.94	1.96
			100	1.56	1.56	6	1	600	100	4.89	0.82
										18.83	2.77

Farmer	No. Animals	Type	% on Farm	Volume m^3/yr/ animal	Volume Total m^3/year	N kg/yr/ animal	P kg/yr/ animal	Total N kg/yr	Total P kg/yr	Total N ha/yr	Total P ha/yr
[redacted]	[redacted]		100	7.8	179.4	24	3	552	69	23.06	2.88
			100	13.52	202.8	57	8	855	120	35.71	5.01
										58.77	7.89

Farmer	No. Animals	Type	% on Farm	Volume m^3/yr/ animal	Volume Total m^3/year	N kg/yr/ animal	P kg/yr/ animal	Total N kg/yr	Total P kg/yr	Total N ha/yr	Total P ha/yr
[redacted]	[redacted]		60	7.8	121.68	24	3	374.4	46.8	12.20	1.52
			60	13.52	202.8	57	8	855	120	27.86	3.91
			60	13.52	81.12	65	10	390	60	12.71	1.96
										52.77	7.39

Farmer	No. Animals	Type	% on Farm	Volume m^3/yr/ animal	Volume Total m^3/year	N kg/yr/ animal	P kg/yr/ animal	Total N kg/yr	Total P kg/yr	Total N ha/yr	Total P ha/yr
[redacted]	[redacted]		20%	3.016	24.44	65	10	325	50	33.92	5.22
			20%	1.56		57	8	342	48	35.70	3.73
			100%	15.08	769.60	65	10	2,600	400	70.84	10.90
			100%	4.16		24	3	960	120	26.16	3.27
			100%	-	-	-	-	-	-	-	-
Total:				23.82				4,227	618	166.63	23.11

4.3 Methodology

The following information was compiled and collated:

a. Ordnance Survey Maps of the areas intended for the receipt of organic material.
b. The cropping program for the coming year and previous land use.
c. Each potential land spread area was assigned a reference number.
d. By reference to the farm map, the current land use and the areas to which the waste is to be applied were identified.
e. Soil analysis of the landbanks were carried out by Mr. Maurice Gannon and analysed in October 2017 by FBA Laboratories (Appendix A).
f. In line with S.I. No. 605 of 2017 [16.3 (c)] soil analysis for the landbank will be required to be repeated every 4 years.

5.3.1 Soil Sampling Procedure

The soil sample shall be taken in accordance with the procedure as specified below:

a) The sampling area shall not exceed 4 hectares. Exceptionally, where soil types and cropping of lands were similar during the previous five years, a sample area of up to 8 hectares shall be deemed acceptable.
b) Separate samples shall be taken from areas that are different in soil type, previous cropping history, slope, drainage or persistent poor yields.
c) Any unusual spots such as old fences, ditches, drinking troughs, dung or urine patches or where fertilisers or lime has been heaped or spilled shall be avoided.
d) A field shall not be sampled for phosphorus until 3 months after the last application of any fertiliser containing this nutrient (chemical or organic).
e) The sampling pattern shown in figure 1 below shall be followed. A soil core shall be taken to the full 100mm depth. 20 cores shall be taken from the sampling area and placed in the soil container to make up the sample. Ensure the container is full of soil.
f) The field and sample numbers shall be written/attached onto the soil container.

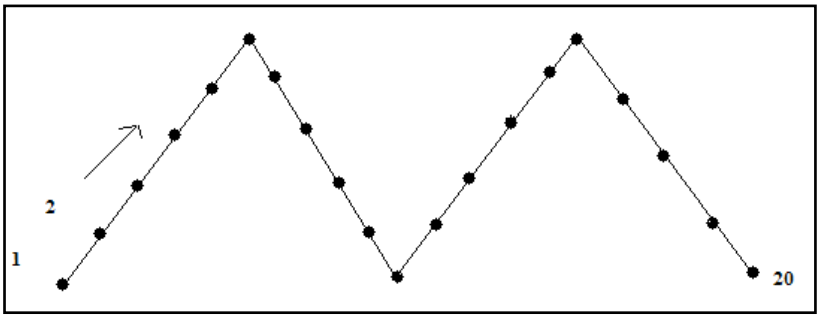


Figure 4-1 Soil Sampling Pattern.

5.3.2 Analysis of Soils

A nutrient analysis was carried out on each of the soil samples. The Phosphorus analysis was used to determine the appropriate spreading rates and nutrient management on each plot. The European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017 tables below show how the appropriate soil indices and phosphorus requirements were determined. The NMP calculations can be seen in Appendix A.

Table 4-2 Phosphorus Index System.

Soil Phosphorus Index	Soil phosphorus ranges (mg/l)	
	Grassland	***Other Crops***
1	0.0 – 3.0	0.0 – 3.0
2	3.1 – 5.0	3.1 – 6.0
3	5.1 – 8.0	6.1 – 10.0
4	> 8.0	> 10.0

Table 4-3 Annual maximum fertilisation rates of available nitrogen on grassland.

Grassland stocking rate[1] (kg/ha/year)	***Available nitrogen[2] (kg/ha)***
≤ 170	*206*
Grassland stocking rate greater than 170 kg/ha/year [3,4]	
171 – 210	*282*
211 – 250	*250*
>250	*250[5]*

[1]Total annual nitrogen (kg) excreted by grazing livestock averaged over the eligible grassland area (ha)(grazing and silage area). Stocking rate refers to grassland area only.

[2]The maximum nitrogen fertilisation of grassland shall not exceed that specified for stocking rates less than or equal to 170 kg/ha/year unless a minimum of 5% of the eligible area of the holding is used to grow crops other than grass or a derogation applies in respect of the holding.

[3]This table does not imply any departure from Article 20(1) which prohibits the application to land on a holding of livestock manure in amounts which exceed 170kg nitrogen per hectare per year, including that deposited by the animals themselves (or 250kg in the case of a holding to which a derogation has been granted, in accordance with the Nitrates Directive).

[4]From 1 January 2021 these fertilisation rates are only applicable where the fertiliser type specified by the Minister for Agriculture, Food and the Marine is used.

[5]The application of nitrogen from livestock manure (including that deposited by the animals themselves) to the eligible grassland area shall not exceed 250 kg nitrogen per hectare per year.

Table 4-4 Annual maximum fertilisation rates of Phosphorus on grassland.

Grassland Stocking rate [1] (kg/ha/year)	Phosphorus Index			
	1	2	3	4
Available Phosphorus (kg/ha) [2,3]				
<85	27	17	7	0
86-130	30	20	10	0
131 – 170	33	23	13	0
Grassland stocking rate greater than 170kg/ha/year[3,4]				
171-210	36	26	16	0
211-250	39	29	19	0
>250	39	29	19	0

[1]Total annual nitrogen (kg) excreted by grazing livestock averaged over the eligible grassland area (grazing and silage area). Stocking rate refers to grassland area only.

[2]The fertilisation rates for soils which have more than 20% organic matter shall not exceed the amounts permitted for Index 3 soils.

[3]Manure produced by grazing livestock on a holding may be applied to Index 4 soils on that holding in a situation where there is a surplus of such manure remaining after the phosphorus fertilisation needs of all crops on soils at phosphorus indices 1, 2 or 3 on the holding have been met by the use only of such manure produced on the holding.

[4]The maximum phosphorus fertilisation of grassland shall not exceed that specified for stocking rates less than or equal to 170 kg/ha/year unless a minimum of 5% of the eligible area of the holding is used to grow crops other than grass or a derogation applies in respect of the holding.

[5]This table does not imply any departure from Article 20(1) which prohibits the application to land on a holding of livestock manure in amounts which exceed 170kg Nitrogen per hectare per year, including that deposited by the animals themselves (or 250kg in the case of a holding to which a derogation has been granted in accordance with the Nitrates Directive).

[6]An additional 15 kg of phosphorus per hectare may be applied on soils at phosphorus indices 1, 2, or 3 for each hectare of pasture establishment undertaken.

Table 4-5 Maximum fertilisation rates of Nitrogen on tillage crops.

Crop	Nitrogen Index			
	1	2	3	4
	Available Nitrogen (kg/ha)			
Spring Barley [1,3]	135	110	75	40
Winter Barley[1]	180	155	120	80
Winter Wheat[1,2]	210	180	120	80
Maize	180	140	110	75
Beet	195	155	120	80
Peas	0	0	0	0
2 x Cut *Silage*	(125+100) = 225			

[1]Where proof of higher yields is available, an additional 20kg N/ha may be applied for each additional tonne above the following yields:

Winter Wheat — 9.0 tonnes/ha Spring Wheat — 7.5 tonnes/ha

Winter Barley — 8.5 tonnes/ha Spring Barley — 6.5 tonnes/ha

Winter Oats — 7.5 tonnes/ha Spring Oats — 6.5 tonnes/ha

The higher yields shall be based on the best yield achieved in any of the three previous harvests, at 20% moisture content.

[2]Where milling wheat is grown under a contract to a purchaser of milling wheat, an extra 30 kg N/ha may be applied.

[3]Where malting barley is grown under a contract to a purchaser of malting barley, an extra 20 kg N/ha may be applied where it is shown on the basis of agronomic advice that additional nitrogen is needed to address a proven low protein content in the grain.

Table 4-6 Maximum fertilisation rates of Phosphorus on tillage crops

Crop	Phosphorus Index			
	1	2	3	4
	Available Phosphorus (kg/ha)[1]			
Spring Barley[2,3]	45	35	25	0
Winter Barley[2,3,5]	45	35	25	0
Winter Wheat[2,3,5]	45	35	25	0
Maize	70	50	40	20[2]
Beet	70	55	40	20
Peas	40	25	20	0
2 x Cut *Silage*	50	40	30	0

[1]The fertilisation rates for soils which have more than 20% organic matter shall not exceed the amounts permitted for Index 3 soils.

[2]Where proof of higher yields is available, an additional 3.8kg P/ha may be applied on soils at phosphorus 1, 2, or 3 for each additional tonne above a yield of 6.5 tonnes/ha. The higher yields shall be based on the best yield achieved in any of the three previous harvests, at 20% moisture content.

[3]Where pH is greater than or equal to 7, 20kg P/ha may be applied on soils at phosphorus index 4.

[5]For winter cereals on soils of P index 1 and 2, 20 kg of the maximum P fertilisation rate may be applied up to 31st October, which must be incorporated prior to or during sowing.

5. Aquifer Vulnerability Assessment

5.1 Introduction

Rowan as part of this NMP were requested by Western Brand to undertake an aquifer vulnerability assessment for the landbanks.

5.2 Methodology

The study involved collecting all relevant data about the lands in question. Information about soils, subsoils, bedrock, groundwater information, aquifer categories and vulnerability data was taken from the Geological Survey of Ireland (GSI) website: www.gsi.ie. From this information an assessment was made regarding the sites subsoil's geology and the hydrogeology and their suitability for landspreading in terms of groundwater vulnerability.

The vulnerability rating is based on the GSI methodology in Figure 6-1 below. The ratings are divided into four vulnerability categories - Extreme **(E)**, High **(H)**, Moderate **(M)** and Low **(L)** - based on the geological and hydrogeological factors described in Figure 6-2 below. In addition, areas with bedrock at or close to surface are given a classification of Extreme **(X).**

Vulnerability Rating	Hydrogeological Conditions				
	Subsoil Permeability (Type) and Thickness			Unsaturated Zone	Karst Features
	High permeability (sand/gravel)	Moderate permeability (e.g. Sandy subsoil)	Low permeability (e.g. Clayey subsoil, clay, peat)	(Sand/gravel aquifers only)	(<30 m radius)
Extreme (E)	0 - 3.0m	0 - 3.0m	0 - 3.0m	0 - 3.0m	-
High (H)	>3.0m	3.0 - 10.0m	3.0 - 5.0m	>3.0m	N/A
Moderate (M)	N/A	>10.0m	5.0 - 10.0m	N/A	N/A
Low (L)	N/A	N/A	>10.0m	N/A	N/A

Notes: (1) N/A = not applicable.
(2) Precise permeability values cannot be given at present.
(3) Release point of contaminants is assumed to be 1-2 m below ground surface.

Figure 5-1. GSI Vulnerability classification.

VULNERABILITY RATING	SOURCE PROTECTION AREA		RESOURCE PROTECTION Aquifer Category					
			Regionally Important (R)		Locally Important (L)		Poor Aquifers (P)	
	Inner	Outer	Rk	Rf/Rg	Lm/Lg	Ll	Pl	Pu
Extreme (E)	R4	R4	R3[2]	R3[2]	R3[3]	R3[1]	R3[1]	R3[1]
High (H)	R4	R2[1]	R1	R1	R1	R1	R1	R1
Moderate (M)	R3[3]	R2[1]	R1	R1	R1	R1	R1	R1
Low (L)	R3[3]	R2[1]	R1	R1	R1	R1	R1	R1

Figure 5-2. Response Matric for Landspreading.

Based on the vulnerability rating and aquifer types the responses are determined using Figure 6-3 below.

***R1**- Acceptable, subject to normal good practice.*
***R2[1]**-Acceptable subject to a maximum organic nitrogen load (including that deposited by grazing animals) not exceeding 170 kg/hectare/yr.*
***R3[1]**-Not generally acceptable, unless a consistent minimum thickness of 1 m of soil and subsoil can be demonstrated.*
***R3[2]**- Not generally acceptable, unless a consistent minimum thickness of 2 m of soil and subsoil can be demonstrated.*
***R3[3]**-Not generally acceptable, unless no alternative areas are available and detailed evidence is provided to show that contamination will not take place.*
***R4**-Not acceptable.*

Figure 5-3. Response Matric Key.

5.3 Landbank Assessment

[redacted]

Location: The landbanks are situated in the townlands of [redacted]. They are located [redacted] The landbank consists of [redacted] grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the majority of the soils at the landbank are BminPD - Surface water Gleys, Ground water Gleys derived from mainly calcareous parent materials. The soils along the south-eastern section of the landbanks are AminPD - Surface water Gleys, Ground water Gleys derived from mainly non-calcareous parent materials.

Subsoils: The Teagasc subsoils from GSI show that the landbank is underlain TCSsCh, Till derived from Carboniferous sandstones and cherts.

Groundwater Aspects: There are no source protection zones in the immediate area of the landbank as recorded in the GSI mapping. There are no karst features or springs recorded in the landholding in the GSI's karst database.

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Low (L) across the entire landbank. The subsoil thickness is likely to be greater than 10m.

***Groundwater Responses*:** The landbanks have a vulnerability rating of Low and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practice.

[redacted]

2. [redacted]

Location: The landbanks are situated in the townlands of [redacted]. They are located c. [redacted]. The landbank consists of [redacted] grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the majority of the soils at the landbank are BminPD - Surface water Gleys, Ground water Gleys derived from mainly calcareous parent materials, with a small patch of BminPDPT – Peaty Gleys derived from mainly calcareous parent materials. The soils along the north-eastern section of the landbanks are BminDW - Grey Brown Podzolics, Brown Earths (medium-high base status) derived from mainly calcareous parent materials.

Subsoils: The Teagasc subsoils from GSI show that the landbank is underlain TLs, Till derived from limestones.

Groundwater Aspects: There are no source protection zones or springs recorded in the immediate area of the landbank as recorded in the GSI mapping. However, there are 2 No. karst features (enclosed depressions) recorded along the northern section of the landholding.

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the majority of the landbanks is classed as Moderate (M) to High (H) with areas classed as Extreme (X) and (E) along the northern and southern sections of the landbank. The subsoil thickness is likely to be 3-10m for the majority of the landbank.

***Groundwater Responses*:** The landbanks have a vulnerability rating of Moderate to High for the majority of the landbanks and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1*- Acceptable, subject to normal good practice.*

R3[2] *– Not generally acceptable, unless a consistent minimum thickness of 2m of soil and subsoil can be demonstrated. (For the areas of land along the northern and southern boundaries).*

3. [redacted]

Location: The landbanks are situated in the townland of [redacted]. They are located [redacted]. The landbanks consists of [redacted] grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the majority of the soils at the landbank are Cut - Basin Peats, Blanket Peats (some) with some BminPD - Surface water Gleys, Ground water Gleys derived from mainly calcareous parent materials.

Subsoils: The Teagasc subsoils from GSI show that the majority of the landbanks are underlain with Cut - Cut over raised peat with some TCSsCh - Till derived from Carboniferous sandstones and cherts.

Groundwater Aspects: There are no source protection zones, karst features or springs within the immediate area of the landbank as recorded in the GSI mapping. However, the [redacted]

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Low (L) across the entire landbank. The subsoil thickness is likely to be greater than 10m.

Groundwater Responses: The landbanks have a vulnerability rating of Low and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practic*e.*

4. [redacted]

Location: The landbanks are situated in the townland of [redacted]. They are located [redacted]. The landbanks consists of [redacted] grassland landbanks with a total land area of [redacted]

Soils: According to EPA mapping, the majority of the soils at the landbank are Cut - Basin Peats, Blanket Peats (some) with some BminDW - Grey Brown Podzolics, Brown Earths (medium-high base status) and BminPD - Surface water Gleys, Ground water Gleys derived from mainly calcareous parent materials.

Subsoils: The Teagasc subsoils from GSI show that the majority of the landbanks are underlain with TLs, Till derived from limestones with some Cut - Cut over raised peat.

Groundwater Aspects: There are no source protection zones or springs within the immediate area of the landbank as recorded in the GSI mapping. However, a karst feature (Enclosed Depression) is noted within the northern landbank.

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Moderate to High (H) with small areas classed as Extreme and X. The subsoil thickness is likely to be 3m-10m.

Groundwater Responses: The landbanks have a vulnerability rating of Moderate to High with small areas classed as Extreme and X and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practice*.*

R3[2] *– Not generally acceptable, unless a consistent minimum thickness of 2m of soil and subsoil can be demonstrated (For the areas with a vulnerability rating classed as Extreme and X).*

5. [redacted]

Location: The landbanks are situated in the townland of [redacted] They are located [redacted]. The landbank consists of [redacted] grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the majority of the soils at the landbank are BminPD - Surface water Gleys, Ground water Gleys derived from mainly calcareous parent materials. The soils at the most western landbank are Cut - Basin Peats, Blanket Peats (some).

Subsoils: The Teagasc subsoils from GSI show that the majority of the landbanks are underlain TCSsCh, Till derived from Carboniferous sandstones and cherts. The subsoils at the most western landbank are Cut over raised peat.

Groundwater Aspects: There are no source protection zones, karst features or springs located within the subject landbanks. The nearest source protection scheme is the [redacted].

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbanks is classed as Low (L) across the entire landbanks. The subsoil thickness is likely to be greater than 10m.

Groundwater Responses: The landbanks have a vulnerability rating of Low and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practic*e.*

6. [redacted]

Location: The landbanks are situated in the townlands of [redacted]. They are located [redacted]. The landbank consists of [redacted] grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the majority of the soils at the landbank are BminPD - Surface water Gleys, Ground water Gleys derived from mainly calcareous parent materials. The soils along the outer perimeter of the landbanks are AlluvMIN - Mineral alluvium.

Subsoils: The Teagasc subsoils from GSI show that the landbank is underlain TLs, Till derived from limestones, with A –Alluvium along the outer perimeter of the landbanks.

Groundwater Aspects: There are no source protection zones, karst features or springs recorded in the immediate area of the landbank as recorded in the GSI mapping. However [redacted]

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Moderate to High across the entire landbank. The subsoil thickness is likely to be 3-10m.

***Groundwater Responses*:** The landbanks have a vulnerability rating of Moderate to High and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practic*e.*

[redacted]

7. [redacted]

Location: The landbanks are situated in the townlands of [redacted] They are located [redacted] The landbank consists of [redacted] grassland landbanks with a total land area of [redacted]

Soils: According to EPA mapping, the majority of the soils at the landbank are Cut - Basin Peats, Blanket Peats (some) with some BminPDPT - Peaty Gleys derived from mainly calcareous parent materials and BminPD - Surface water Gleys, Ground water Gleys derived from mainly calcareous parent materials.

Subsoils: The Teagasc subsoils from GSI show that the majority of the landbanks are underlain with Cut - Cut over raised peat with some TLs, Till derived from limestones.

Groundwater Aspects: There are no source protection zones, karst features or springs within the immediate area of the landbank as recorded in the GSI mapping. However, the [redacted]

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Low (L) across the entire landbank. The subsoil thickness is likely to be greater than 10m.

Groundwater Responses: The landbanks have a vulnerability rating of Low and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practic*e.*

8. [redacted]

Location: The landbanks are situated in the townlands of [redacted]. They are located [redacted]. The landbank consists of [redacted] grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the majority of the soils at the landbank are Cut - Cutaway/cutover peat, with small areas of BminSW Renzinas, Lithosols derived from mainly calcareous parent materials and BminSPPT - Peaty Gleys (Shallow) noted throughout.

Subsoils: The Teagasc subsoils from GSI show that the majority of the landbanks are underlain with Cut - Cut over raised peat with small areas of GLs - Gravels derived from Limestones noted throughout.

Groundwater Aspects: There are no source protection zones, karst features or springs noted in the immediate area of the landbank as recorded in the GSI mapping. However, the [redacted]

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Low (L) to Moderate (M) across the entire landbank. The subsoil thickness is likely to be 5-10m.

Groundwater Responses: The landbanks have a vulnerability rating of Low to Moderate and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practice.

[redacted]

9. [redacted]

Location: The landbanks are situated in the townlands of [redacted]. They are located [redacted] The landbanks consists of [redacted] grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the majority of the soils at the landbank are BminSW Renzinas, Lithosols derived from mainly calcareous parent materials and BminSP - Surface water Gleys (Shallow), Ground water Gleys (Shallow).

Subsoils: The Teagasc subsoils from GSI show that the majority of the landbanks are underlain with Cut - Cut over raised peat with small areas of GLs - Gravels derived from Limestones noted throughout.

Groundwater Aspects: There are no source protection zones, karst features or springs noted in the immediate area of the landbank as recorded in the GSI mapping. However the [redacted].

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Moderate (M) to High (H) across the entire landbank. The subsoil thickness is likely to be 3-10m.

Groundwater Responses: The landbanks have a vulnerability rating of Moderate to High and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practic*e.*

[redacted]

10. [redacted]

Location: The landbank is situated in the townland of [redacted]. It is located [redacted]. The landbank consists of grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the soils at the majority of the landbank are BminPD - Surface water Gleys, Ground water Gleys derived from mainly calcareous parent materials, with occasional BminPDPT – Peaty Gleys.

Subsoils: The Teagasc subsoils from GSI show that the landbank is underlain TLs, Till derived from limestones.

Groundwater Aspects: There are no source protection zones or karst features springs located in the immediate area of the landbank as recorded in the GSI mapping. There is 1 No. borehole within the vicinity of the landbank [redacted]

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Low to Moderate across the entire landbank. The subsoil thickness is likely to be >10m.

Groundwater Responses: The landbanks have a vulnerability rating of Low to Moderate and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practic*e.*

[redacted]

11. [redacted]

Location: The landbank is situated in the townland of [redacted]. It is located [redacted]. The landbank consists of grassland landbanks with a total land area of [redacted]

Soils: According to EPA mapping, the soils at the landbank are BminDW - Grey Brown Podzolics, Brown Earths (medium-high base status) derived from mainly calcareous parent materials.

Subsoils: The Teagasc subsoils from GSI show that the landbank is underlain TLs, Till derived from limestones.

Groundwater Aspects: There are no source protection zones, springs or boreholes located in the immediate area of the landbank as recorded in the GSI mapping.

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed Low across the entire landbank. The subsoil thickness is likely to be >10m.

Groundwater Responses: The landbanks have a vulnerability rating of Low and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practic*e.*

12. [redacted]

Location: The landbank is situated in the townland of [redacted]. It is located [redacted] The landbank consists of grassland landbanks with a total land area of [redacted]

Soils: According to EPA mapping, the majority of the soils at the landbank are BminPDPT - Peaty Gleys, derived from mainly calcareous parent materials, with occasional BminPD - Surface water Gleys, Ground water Gleys derived from mainly calcareous parent materials and Basin Peats, Blanket Peats.

Subsoils: The Teagasc subsoils from GSI show that the majority of the landbank is underlain with TLs, Till derived from limestones, with occasional alluvium and Cut over raised peat.

Groundwater Aspects: There are no source protection zones or karst features located in the immediate area of the landbank as recorded in the GSI mapping. However, there is 1No. borehole [redacted] noted within the landbanks.

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Low to Moderate across the entire landbank. The subsoil thickness is likely to be >10m.

Groundwater Responses: The landbanks have a vulnerability rating of Low to Moderate and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practice.

[redacted]

13. [redacted]

Location: The Kiltultoge landbank is situated [redacted]. The landbank consists of [redacted] grassland fields with a total land area of [redacted].

Soils: The soils at the site are underlain with Grey Brown Podzolics, Brown Earths (medium-high base status) (BminDW) along the north and south sections of the landbank, with Surface water Gleys, Ground water Gleys (BminPD) along the centre of the landbank.

Subsoils: The Teagasc subsoils maps show that the landbank is predominately underlain by Till derived chiefly from limestone (TLs).

Groundwater Aspects: There are no karst or source protection zones in the immediate vicinity of the landbank. There is a borehole [redacted] recorded to a location accuracy to [redacted] along the southern boundary of the landbank in the GSI's Groundwater and Springs database.

Aquifer Vulnerability: The aquifer at the site is classed as Rkc (Regionally Important Aquifer - Karstified (conduit)) by the GSI. The vulnerability rating for the landbank is classed as Moderate (M) for the majority of the site with a small section classed High (H) along the [redacted] with the subsoil thickness likely to be between 5-10m.

***Groundwater Responses*:** The landbank has a vulnerability rating as Moderate (M) to High (H) and is underlain by a regionally important aquifer (Rkc). Based on the GSI criteria, the response is as follows:

***R1**- Acceptable, subject to normal good practice.*

[redacted]

14. [redacted]

Location: The [redacted] is situated c. [redacted]. The landbank consists of [redacted] grassland landbank with a total land area of [redacted]

Soils: The soils at the site are underlain with Surface water Gleys, Ground water Gleys (BminPD) with sections of Cutaway/cutover peat (Cut) and Grey Brown Podzolics, Brown Earths (medium-high base status) (BminDW) along the north eastern sections.

Subsoils: The Teagasc subsoils maps show that the majority of the landbank is underlain with Till derived from limestone (TLs), with Cut over raised peat (Cut) along the north eastern sections.

Groundwater Aspects: There are no source protection zones or karst features identified in the immediate vicinity of the landbank. There is evidence of 1 No. borehole [redacted] within the landbank recorded to a location accuracy of [redacted] in the GSI's Groundwater Well and Springs database.

Aquifer Vulnerability: The aquifer at the site is classed as Rkc (Regionally Important Aquifer - Karstified (conduit)) by the GSI. The vulnerability rating for the landbank is classed as High (H) along the north western sections of the landbank and Low (L) along the southern and eastern sections of the landbank. The subsoil thickness likely to be between 3-5m along the northern section and >10m along the southern section.

***Groundwater Responses*:** The landbank at [redacted] has a vulnerability rating of High (H) to Low (L) and the landbank is underlain by a Regionally Important Aquifer (Rkc). Based on the GSI criteria the response is as follows:

R1*- Acceptable, subject to normal good practice.*

[redacted]

15. [redacted]

Location: The landbanks are situated c. [redacted] The landbank consists of [redacted] grassland fields with a total land area of [redacted].

Soils: The soils at the site are underlain with Grey Brown Podzolics, Brown Earths (medium-high base status) (BminDW), with Cutaway/cutover peat (Cut) along the north western and south eastern sections and small sections of Peaty Gleys (BminPDPT) and Surface Water Gleys (BminPD) throughout. A small [redacted] is also noted in the north western section of the landbank.

Subsoils: The Teagasc subsoils maps show that the landbank is predominately underlain by Till derived from chiefly from limestone (TLs), with sections of Cut over raised peat (Cut) along the north western and south western and south eastern boundaries.

Groundwater Aspects: There are no source protection zones in the landbank as recorded in the GSI mapping. There are 2 No. karst features listed as enclosed depressions along the south western section of the site and a number of boreholes listed on the GSI's Groundwater Wells and Springs database to a location accuracy of [redacted] and 1 No. Spring along the eastern section of the landbank with a location accuracy of [redacted].

Aquifer Vulnerability: The aquifer at the site is classed as Rkc (Regionally Important Aquifer - Karstified (conduit)) by the GSI. The vulnerability rating for the landbank is predominantly classed as Moderate (M) with an area of the landbank along the northern boundary classed as High (H) to Extreme (E). The 2 No. Karst features located along the south western section of the landbank have a vulnerability rating of X as they have exposed rock. The subsoil thickness likely to be between 5-10m for the majority of the site with exception to the areas of exposed rock with a vulnerability rating of X.

***Groundwater Responses*:** The landbank has a vulnerability rating of Moderate (M) for the majority of the landbank and the landbank and is underlain by a regionally important aquifer (Rkc). Based on the GSI criteria, the responses are as follows:

R1 *- Acceptable, subject to normal good practice* (For the majority of the landbank), and;

R3 [2] *– Not generally acceptable, unless a consistent minimum thickness of 2m of soil and subsoil can be demonstrated.* (Along the northern section of the landbank where the vulnerability rating is Extreme). A buffer zone named "Other Exclusions", has been created on the maps to exclude this area from landspreading.

[redacted]

16. [redacted]

Location: The landbank is situated in the townland of [redacted]. It is located c.[redacted]. The landbank consists of several grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the majority of the soils at the landbank are AminDW- Acid Brown Earths, Brown Podzolics, AminPDPT- Peaty Gleys and Cutaway/cutover peat.

Subsoils: The Teagasc subsoils from GSI show that the landbank is underlain with TLs - Till derived from limestones and Cut over raised peat.

Groundwater Aspects: There are no source protection zones, karst features or springs recorded in the immediate area of the landbank as recorded in the GSI mapping. The [redacted]

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Low to Moderate across the entire landbank. The subsoil thickness is likely to be >5m.

Groundwater Responses: The landbanks have a vulnerability rating of Low to Moderate and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practice.

[redacted]

17. [redacted]

Location: The landbank is situated in the townlands of [redacted]. It is located [redacted]. The landbank consists of several grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the majority of the soils at the landbank are BminPD-Surface water Gleys, Ground water Gleys and Cut- Basin Peats, Blanket Peats (some).

Subsoils: The Teagasc subsoils from GSI show that the landbank is underlain with TLs, Till derived from Limestone and Cut over raised peat.

Groundwater Aspects: There are no source protection zones, karst features or springs recorded in the immediate area of the landbank as recorded in the GSI mapping.

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Low across the landbank. The subsoil thickness is likely to be >10m.

Groundwater Responses: The landbanks have a vulnerability rating of Low and the site is underlain by a regionally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practice

. [redacted]

18. [redacted]

Location: The landbank is situated in the townlands of [redacted]. It is located [redacted] The landbank consists of several grassland landbanks with a total land area of [redacted].

Soils: According to EPA mapping, the majority of the soils at the landbank vary between AminDW - Acid Brown Earths, Brown Podzolics derived from mainly non-calcareous parent materials, AminPD - Surface water Gleys, Ground water Gleys derived from mainly non-calcareous parent materials and Cutaway/cutover peat.

Subsoils: The Teagasc subsoils from GSI show that the landbank is underlain TLs - Till derived from Limestone and shales and Cut - Cut over raised peat.

Groundwater Aspects: There appears to be a spring o[redacted] of the land banks. The landbank is also located within the [redacted].

Aquifer Vulnerability: The aquifer at the site is classed as Rkc - Regionally Important Aquifer - Karstified (conduit) by the GSI. The vulnerability rating for the landbank is classed as Low (L) across the majority of the landbanks, however, small area of land at the southeasten corner of the lower landbanks is classified as Extreme (E). The subsoil thickness is likely to be greater than 10m in most areas except for the extreme area where it may be <3m thick.

***Groundwater Responses*:** The landbanks have a vulnerability rating of Low and the site is underlain by a regionally important aquifer and located within the [redacted] Based on the GSI criteria the response is classed as follows:

R21-*Acceptable subject to a maximum organic nitrogen load (including that deposited by grazing animals) not exceeding 170 kg/hectare/yr.*

R3² *– Not generally acceptable, unless a consistent minimum thickness of 2m of soil and subsoil can be demonstrated.* (in the south eastern section of the landbank where the vulnerability rating is Extreme). A buffer zone named “Other Exclusions”, has been created on the maps to exclude this area from landspreading.

[redacted]

6. Conclusion

This conclusion is based on the statutory requirements set out in S.I. No. 605 of 2017, and on soil and organic material analysis.

Western Brand expect to generate the following quantities of organic wastes during 2023:

- 4,500MT of WWTP Sludge

In summary the landbanks have been mapped and soil sampled in 2018 & 2019. Where soil samples have not been completed in the previous 4 years, it will be assumed that the soils are Phosphorus Index 3 in accordance with Part 3, 16 (2) (a) of SI 605 of 2017, unless previous analysis indicated Phosphorus Index 4.

Landbanks with a Phosphorus Index of 4 and/or landbanks which have a vulnerability rating of Extreme shall be omitted from landspreading (unless it was found the consistent depth of combined soil and subsoil was greater than 1 meter) and therefore, the actual useable area of the landbanks may be significantly less than the usable area listed on the mapping. Also, in some instances, a maximum volumetric loading of 300m^3/MT (based on 6 No. applications during the open season) shall be applied on the landspreading on landbanks in accordance with S.I. No. 605 of 2017.

A summary of the NMP for 2023 is provided below:

Summary	NMP 2023 Usable Area (ha)	NMP 2023 Capacity MT	Total Volume Produced by Western Brand MT/Yr.	Land Capacity
WWTP Sludge	343.5ha	6,922	4,500	154%

- Appendix A: NMP 2023 Summary
- Appendix B: Land Bank Maps and Nutrient Requirements
- Appendix C: Sludge Analysis 2022
- Appendix D: Soil Analysis
- Appendix E: Rowan Sign off

Appendix A: NMP 2023 Summary

Farmer	Ref Code	Townlands	County	Total Ha	Usable Ha	Organic fertiliser that may be spread (MT):
[redacted]					45.40	995.2
					24.00	1,153.1
					7.00	310.8
					4.05	182.7
					14.1	490.8
					29.2	893.9
					18.8	0.0
					10.7	248.1
					15.8	410.0
					25.60	182.8
					14.86	190.2
					5.3	62.3
					26.32	0.0
					8.92	362.0
					33.2	0.0
					12.71	648.5
					47.57	792.0
					343.5	**6,922.3**
Total Recovery Capacity (MT) 2023 WWTP Sludge					**6,922.3**	

Western Brand Organic Waste	*Nitrogen*	*Phosphorus*
	Kg/MT	*Kg/MT*
26/10/2022	0.34	0.98

Appendix B: Land Bank Maps and Nutrient Requirements

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]			SS44	4.8	21/12/2021	2	2 x Cut	40	3.13	37.6	36.9	131.7	18.75	13	32	225	100%
			SS45	5.4	21/12/2021	3	2 x Cut	30	3.13	27.4	26.9	68.6	18.75	9	28	225	100%
			SS46	6.5	21/12/2021	3	2 x Cut	30	3.13	27.4	26.9	90.5	18.75	9	28	225	100%
			SS47	5.2	21/12/2021	3	2 x Cut	30	3.13	27.4	26.9	68.6	18.75	9	28	225	100%
			SS48	7.1	21/12/2021	3	2 x Cut	30	3.13	27.4	26.9	87.8	18.75	9	28	225	100%
			SS49	6.7	21/12/2021	3	2 x Cut	30	3.13	27.4	26.9	101.5	18.75	9	28	225	100%
			SS50	4.3	21/12/2021	2	2 x Cut	40	3.13	37.6	36.9	150.5	18.75	13	32	225	100%
			SS51	5.6	21/12/2021	3	2 x Cut	30	3.13	27.4	26.9	109.7	18.75	9	28	225	100%
			SS52	6.4	21/12/2021	3	2 x Cut	30	3.13	27.4	26.9	93.2	18.75	9	28	225	100%
			SS53	9.5	21/12/2021	4	2 x Cut	0	3.13	0.0	0.0	0.0	18.75	0	19	225	0%
			SS54	9.4	21/12/2021	4	2 x Cut	0	3.13	0.0	0.0	0.0	18.75	0	19	225	0%
			SS55	7.7	21/12/2021	3	2 x Cut	30	3.13	27.4	26.9	93.2	18.75	9	28	225	100%
			SS56	11.6	21/12/2021	4	2 x Cut	0	3.13	0.0	0.0	0.0	18.75	0	19	225	0%
			SS57	12.6	21/12/2021	4	2 x Cut	0	3.13	0.0	0.0	0.0	18.75	0	19	225	0%
										294.6	288.75	995.22					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**995 MT**
Total usable area:	**45.4 Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

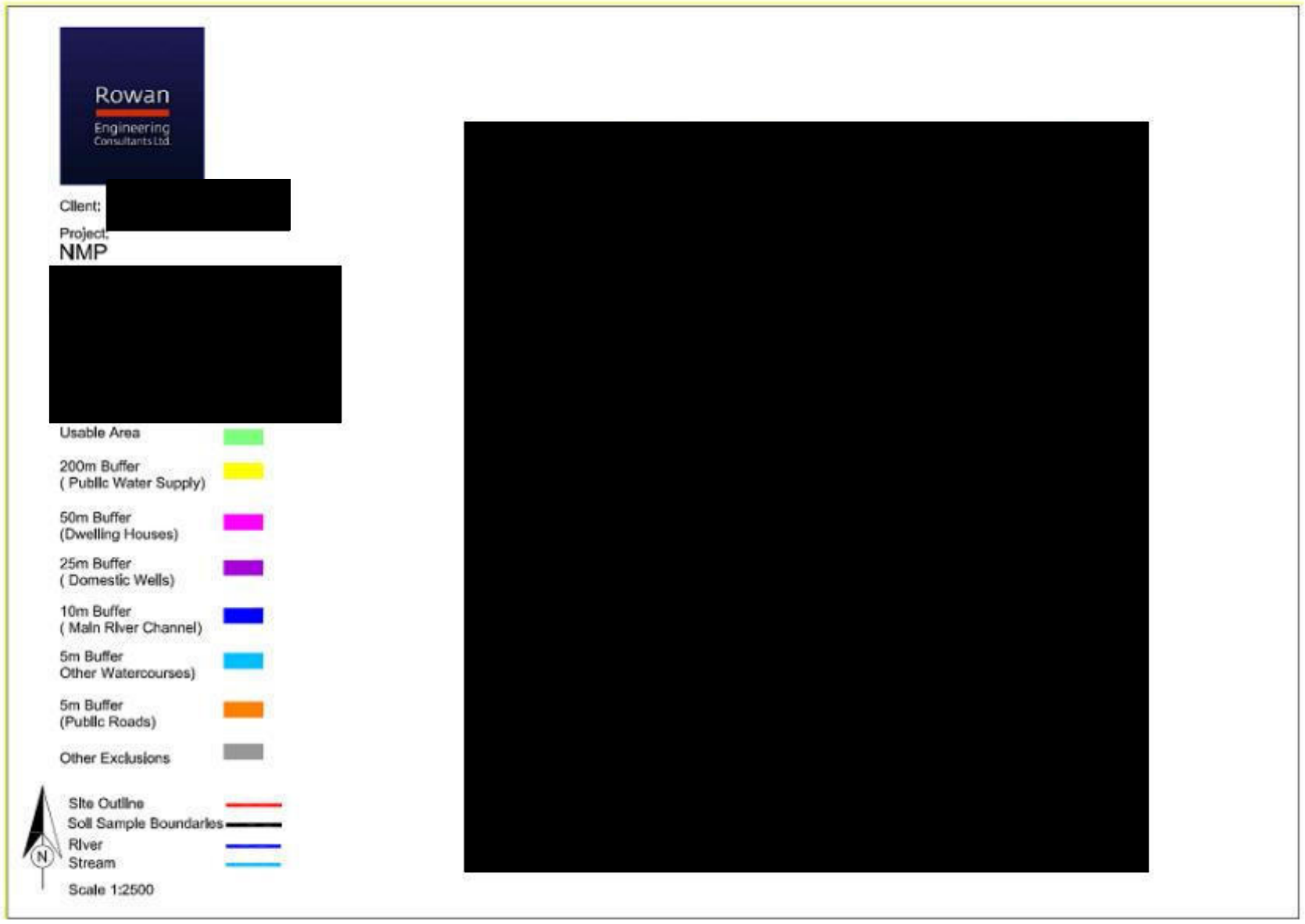
2 X Cut	2 X Cut Silage

On farm N	18.75	Kg N/ha
On farm P	3.13	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	975.31	Kg P
Total On Farm P	141.88	Kg P
Total P/Ha	24.61	Kg P/Total Useable

Total Imported N	338.37	Kg N
Total On Farm N	851.25	Kg N
Total N/Ha	26.20	Kg N/Total Useable


Rowan
Engineering
Consultants Ltd.
Client:
Project:
NMP
Usable Area
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling Houses)
25m Buffer
(Domestic Wells)
10m Buffer
(Main River Channel)
5m Buffer
Other Watercourses)
5m Buffer
(Public Roads)
Other Exclusions
Site Outline
Soil Sample Boundaries
River
Stream
N
Scale 1:2500

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		0.0	SS2	2.3	13/08/2019	1	2 x Cut	50	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		5.0	SS3	2.6	13/08/2019	1	2 x Cut	50	0.00	51.0	50.0	255.1	0.00	17	17	225	100%
		0.0	SS4	3.9	13/08/2019	2	2 x Cut	40	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		4.0	SS5	2.4	13/08/2019	1	2 x Cut	50	0.00	51.0	50.0	204.1	0.00	17	17	225	100%
		4.0	SS6	2.2	13/08/2019	1	2 x Cut	50	0.00	51.0	50.0	204.1	0.00	17	17	225	100%
		3.5	SS7	2.8	13/08/2019	1	2 x Cut	50	0.00	51.0	50.0	178.6	0.00	17	17	225	100%
		4.0	SS8	2.3	13/08/2019	1	3 x Cut	50	0.00	51.0	50.0	204.1	0.00	17	17	225	100%
		0.0	SS9	6.6	13/08/2019	3	4 x Cut	30	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		3.5	SS10	6.4	13/08/2019	3	2 x Cut	30	0.00	30.6	30.0	107.1	0.00	10	10	225	100%
		0.0	SS11	6.5	13/08/2019	3	2 x Cut	30	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		24.0								**285.7**	**280.00**	**1,153.06**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**1,153 MT**
Total usable area:	**24.0 Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 x Cut	2 x Cut Silage

On farm N	0.00	Kg N/ha
On farm P	0.00	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	1130.00	Kg P
Total On Farm P	0.00	Kg P
Total P/Ha	47.08	Kg P/Total Useable

Total Imported N	392.04	Kg N
Total On Farm N	0.00	Kg N
Total N/Ha	16.34	Kg N/Total Useable


Notes:
Notes:
[redacted]
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling houses)
25m Buffer
(Domestic Water)
10m
(River Channel)
5m buffer
(Other Watercourses)
5m Buffer
(Public Roads)
5m Buffer
(Hedgerow)
Site outline
River
Stream
High Vulnerability area
Karst (Depression)
Rowan Engineering
Consultants Ltd
Unit 1, Scurlockstown Business Park,
Trim,Co. Meath
www.rec.ie
Gannon Transport
Environmental Services
Rowan Engineering Consultants
[redacted]
NMP Map
1:7500
09/07/19
CC
ID
GAN0001-3
GAN02
0

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		4.4	SS12	2.3	13/08/2019	1	2 x Cut	50	2.77	48.2	47.2	212.0	0.00	16	16	225	100%
		2.6	SS13	3.4	13/08/2019	2	2 x Cut	40	2.77	38.0	37.2	98.8	0.00	13	13	225	100%
		7.0								**86.2**	**84.46**	**310.82**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**311**	**MT**
Total usable area:	**7.0**	**Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 x Cut	2 x Cut Silage

On farm N	0.00	Kg N/ha
On farm P	2.77	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	304.60	Kg P
Total On Farm P	19.40	Kg P
Total P/Ha	46.29	Kg P/Total Useable

Total Imported N	105.68	Kg N
Total On Farm N	0.00	Kg N
Total N/Ha	15.10	Kg N/Total Useable


N
Notes:
[redacted]
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling houses)
25m Buffer
(Domestic Water)
10m
(River Channel)
5m buffer
(Other Watercourses)
5m Buffer
(Public Roads)
5m Buffer
(Hedgerow)
Site outline
River
Stream
Karst (Depression)
Rowan Engineering
Consultants Ltd
Unit 1, Scurlockstown Business Park,
Trim, Co. Meath
www.rec.ie
Gannon Transport
Environmental Services
Rowan Engineering Consultants
[redacted]
1:5000
09/09/19
CC
ID
GAN0001-3
GAN09
0

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		1.7	SS14	3	13/08/2019	1	2 X CUT	50	0.00	51.0	50.0	86.7	0.00	17	17	225	100%
		2.4	SS15	3.9	13/08/2019	2	2 X CUT	40	0.00	40.8	40.0	95.9	0.00	14	14	225	100%
		4.1								**91.8**	**90.00**	**182.65**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**183**	**MT**
Total usable area:	**4.1**	**Hectares**

On farm N	0.00	Kg N/ha
On farm P	0.00	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

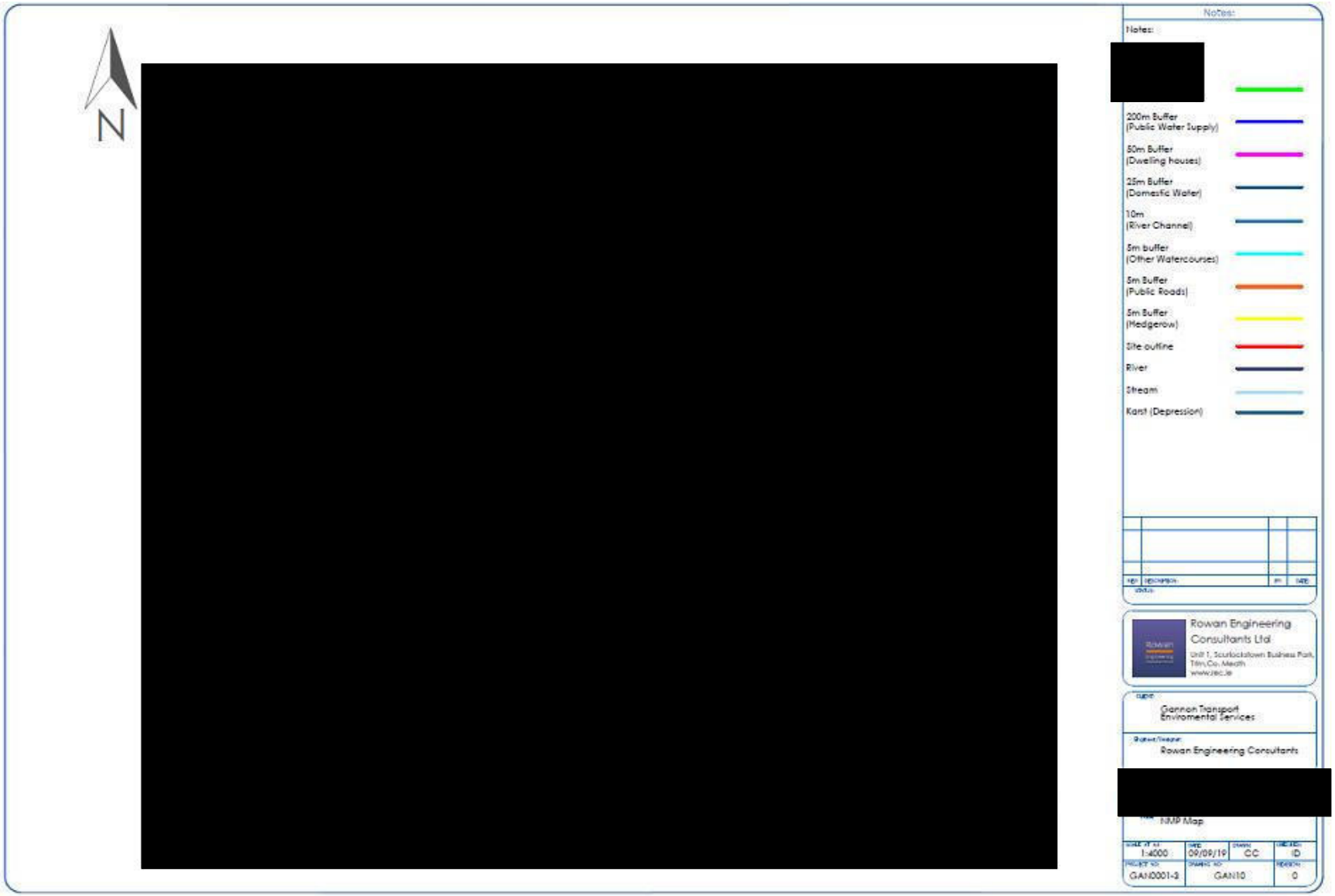
Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 x Cut	2 x Cut Silage

Total Imported P	179.00	Kg P
Total On Farm P	0.00	Kg P
Total P/Ha	44.20	Kg P/Total Useable

Total Imported N	62.10	Kg N
Total On Farm N	0.00	Kg N
Total N/Ha	15.33	Kg N/Total Useable


N
Notes:
Notes:
[redacted]
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling houses)
25m Buffer
(Domestic Water)
10m
(River Channel)
5m buffer
(Other Watercourses)
5m Buffer
(Public Roads)
5m Buffer
(Hedgerow)
Site outline
River
Stream
Karst (Depression)
Rowan Engineering
Consultants Ltd
Unit 1, Scurlockstown Business Park,
Trim,Co. Meath
www.rec.ie
Gannon Transport
Environmental Services
Rowan Engineering Consultants
[redacted]
NMP Map
1:4000
09/09/19
CC
ID
GAN0001-3
GAN10
0

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		2.7	SS16	4.4	13/08/2019	2	2 X CUT	40	0.00	40.8	40.0	110.2	0.00	14	14	225	100%
		2.5	SS17	5.1	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	76.5	0.00	10	10	225	100%
		3.1	SS18	5.2	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	94.9	0.00	10	10	225	100%
		3.1	SS19	3.5	13/08/2019	2	2 X CUT	40	0.00	40.8	40.0	126.5	0.00	14	14	225	100%
		2.7	SS20	6.5	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	82.7	0.00	10	10	225	100%
		14.1								**173.5**	**170.00**	**490.82**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**491 MT**
Total usable area:	**14.1 Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 x Cut	2 x Cut Silage

On farm N	0.00	Kg N/ha
On farm P	0.00	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	481.00	Kg P
Total On Farm P	0.00	Kg P
Total P/Ha	34.11	Kg P/Total Useable

Total Imported N	166.88	Kg N
Total On Farm N	0.00	Kg N
Total N/Ha	11.84	Kg N/Total Useable


N
Notes:
Notes:
[redacted]
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling houses)
25m Buffer
(Domestic Water)
10m
(River Channel)
5m buffer
(Other Watercourses)
(Public Roads)
5m Buffer
(Hedgerow)
Site outline
River
Stream
Rowan Engineering
Consultants Ltd
Gannon Transport
Environmental Services
Rowan Engineering Consultants
[redacted]
NMP Map
1:4000
09/07/19
CC
ID
GAN0001-3
GAN03
0

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		4.2	SS21	6.7	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	128.6	0.00	10	10	225	100%
		4.2	SS22	6.4	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	128.6	0.00	10	10	225	100%
		4.2	SS23	6.4	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	128.6	0.00	10	10	225	100%
		4.0	SS24	6.2	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	122.4	0.00	10	10	225	100%
		4.0	SS25	7	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	122.4	0.00	10	10	225	100%
		3.8	SS26	6.1	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	116.3	0.00	10	10	225	100%
		3.8	SS27	6.1	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	116.3	0.00	10	10	225	100%
		1.0	SS28	6.1	13/08/2019	3	2 X CUT	30	0.00	30.6	30.0	30.6	0.00	10	10	225	100%
		29.2								**244.9**	**240.0**	**893.9**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**894**	**MT**
Total usable area:	**29.2**	**Hectares**

On farm N	0.00	Kg N/ha
On farm P	0.00	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 x Cut	2 x Cut Silage

Total Imported P	876.00	Kg P
Total On Farm P	0.00	Kg P
Total P/Ha	30.00	Kg P/Total Useable

Total Imported N	303.92	Kg N
Total On Farm N	0.00	Kg N
Total N/Ha	10.41	Kg N/Total Useable


N
Notes:
Notes:
[redacted]
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling houses)
25m Buffer
(Domestic Water)
10m
(River Channel)
5m buffer
(Other Watercourses)
5m Buffer
(Public Roads)
5m Buffer
(Hedgerow)
Site outline
River
Stream
Rowan Engineering Consultants Ltd
Unit 1, Scurlockstown Business Park, Trim,Co. Meath
www.rec.ie
Gannon Transport Environmental Services
Rowan Engineering Consultants
[redacted]
NMP Map
1:5000
10/07/19
CC
ID
GAN0001-3
GAN04
0

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		18.8	302275	15	21/12/2021	4	2 X CUT	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		18.8								**0.0**	**0.00**	**0.00**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**0**	**MT**
Total usable area:	**18.8**	**Hectares**

On farm N	0.00	Kg N/ha
On farm P	0.00	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 x Cut	2 x Cut Silage

Total Imported P	0.00	Kg P
Total On Farm P	0.00	Kg P
Total P/Ha	0.00	Kg P/Total Useable

Total Imported N	0.00	Kg N
Total On Farm N	0.00	Kg N
Total N/Ha	0.00	Kg N/Total Useable


N
Notes:
Notes:
[redacted]
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling houses)
25m Buffer
(Domestic Water)
10m
(River Channel)
5m buffer
(Other Watercourses)
5m Buffer
(Public Roads)
5m Buffer
(Hedgerow)
Site outline
River
Stream
Karst (Depression)
Rowan Engineering Consultants Ltd
Unit 1, Scurlockstown Business Park,
Trim,Co. Meath
www.rec.ie
Gannon Transport Environmental Services
Rowan Engineering Consultants
[redacted]
NMP Map
1:6000
11/07/19
CC
ID
GAN0001-3
GAN08
0

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		4.8	SS29	6	13/08/2019	3	2 x Cut	30	7.27	23.2	22.7	111.3	51.82	8	60	225	100%
		3.9	SS30	6.2	13/08/2019	3	2 x Cut	30	7.27	23.2	22.7	90.4	51.82	8	60	225	100%
		2.0	SS31	5.9	13/08/2019	3	2 x Cut	30	7.27	23.2	22.7	46.4	51.82	8	60	225	100%
		10.7								**69.6**	**68.18**	**248.14**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**248 MT**
Total usable area:	**10.7 Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 x Cut	2 x Cut Silage

On farm N	51.82	Kg N/ha
On farm P	7.27	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	243.18	Kg P
Total On Farm P	77.82	Kg P
Total P/Ha	30.00	Kg P/Total Useable

Total Imported N	84.37	Kg N
Total On Farm N	554.45	Kg N
Total N/Ha	59.70	Kg N/Total Useable


N
Notes:
Notes:
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling houses)
20m Buffer
(Domestic Water)
10m
(River Channel)
5m buffer
(Other Watercourses)
5m Buffer
(Public Roads)
5m Buffer
(Hedgerow)
Site outline
River
Stream
Rowan Engineering
Consultants Ltd
Gannon Transport
Environmental Services
Rowan Engineering Consultants
NMP Map
1:8000
10/07/19
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ID
GAN0001-0
GAN05
0

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		4.1	SS33	6.2	13/09/2019	3	2 x Cut	30	4.57	25.9	25.4	106.4	32.57	9	41	225	100%
		4.1	SS34	6.1	13/09/2019	3	2 x Cut	30	4.57	25.9	25.4	106.4	32.57	9	41	225	100%
		4.1	SS35	6.5	13/09/2019	3	2 x Cut	30	4.57	25.9	25.4	106.4	32.57	9	41	225	100%
		1.5	SS36	5.9	13/09/2019	3	2 x Cut	30	4.57	25.9	25.4	38.9	32.57	9	41	225	100%
		2.0	SS37	6.1	13/09/2019	3	2 x Cut	30	4.57	25.9	25.4	51.9	32.57	9	41	225	100%
		15.8								**129.7**	**127.14**	**409.97**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**410 MT**
Total usable area:	**15.8 Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 x Cut	2 x Cut Silage

On farm N	32.57	Kg N/ha
On farm P	4.57	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	401.77	Kg P
Total On Farm P	72.23	Kg P
Total P/Ha	30.00	Kg P/Total Useable

Total Imported N	139.39	Kg N
Total On Farm N	514.63	Kg N
Total N/Ha	41.39	Kg N/Total Useable


N
Notes:
Notes:
[redacted]
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling houses)
25m Buffer
(Domestic Water)
10m
(River Channel)
5m buffer
(Other Watercourses)
5m Buffer
(Public Roads)
5m Buffer
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Site outline
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Gannon Transport
Enviromental Services
Rowan Engineering Consultants
[redacted]
NMP Map
1:8000
10/07/19
CC
ID
GAN0001-3
GAN05
0

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		3.0	SS38	10.1	13/08/2019	4	2 X CUT	0	2.86	0.0	0.0	0.0	20.36	0	20	225	0%
		3.1	SS39	11.3	13/08/2019	4	2 X CUT	0	2.86	0.0	0.0	0.0	20.36	0	20	225	0%
		3.1	SS40	10.3	13/08/2019	4	2 X CUT	0	2.86	0.0	0.0	0.0	20.36	0	20	225	0%
		3.2	SS41	5.5	13/08/2019	3	2 X CUT	30	2.86	27.7	27.1	88.6	20.36	9	30	225	100%
		3.2	SS42	9.9	13/08/2019	4	2 X CUT	0	2.86	0.0	0.0	0.0	20.36	0	20	225	0%
		3.2	SS43	8.2	13/08/2019	4	2 X CUT	0	2.86	0.0	0.0	0.0	20.36	0	20	225	0%
		3.4	SS44	5.3	13/08/2019	3	2 X CUT	30	2.86	27.7	27.1	94.2	20.36	9	30	225	100%
		3.4	SS45	9.3	13/08/2019	4	2 X CUT	0	2.86	0.0	0.0	0.0	20.36	0	20	225	0%
		25.6								**55.4**	**54.29**	**182.80**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**183**	**MT**
Total usable area:	**25.6**	**Hectares**

On farm N	20.36	Kg N/ha
On farm P	2.86	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 x Cut	2 x Cut Silage

Total Imported P	179.14	Kg P
Total On Farm P	73.14	Kg P
Total P/Ha	38.23	Kg P/Total Useable

Total Imported N	62.15	Kg N
Total On Farm N	521.14	Kg N
Total N/Ha	88.38	Kg N/Total Useable


N
Notes:
Notes:
[redacted]
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling houses)
25m Buffer
(Domestic Water)
10m
(River Channel)
5m buffer
(Other Watercourses)
5m Buffer
(Public Roads)
5m Buffer
(Hedgerow)
Site outline
River
Stream
Karst (Depression)
Rowan Engineering
Consultants Ltd
Unit 1, Scurlockstown Business Park,
Trim,Co. Meath
www.rec.ie
Gannon Transport
Environmental Services
Rowan Engineering Consultants
[redacted]
NMP Map
1:6000
10/07/19
CC
ID
GAN0001-2
GAN07
0

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		4.6	302276	11.7	21/12/2021	4	2 Cut	0	7.89	0.0	0.0	0.0	58.77	0	59	225	0%
		1.9	302277	13.6	21/12/2021	4	2 Cut	0	7.89	0.0	0.0	0.0	58.77	0	59	225	0%
		8.4	302278	7.2	21/12/2021	3	2 Cut	30	7.89	22.6	22.1	190.2	58.77	8	66	225	100%
		14.9								**22.6**	**22.11**	**190.15**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

On farm N	58.77	Kg N/ha
On farm P	7.89	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total volume of WWTP Sludge that can be imported on to the farm:	**190**	**MT**
Total usable area:	**14.9**	**Hectares**

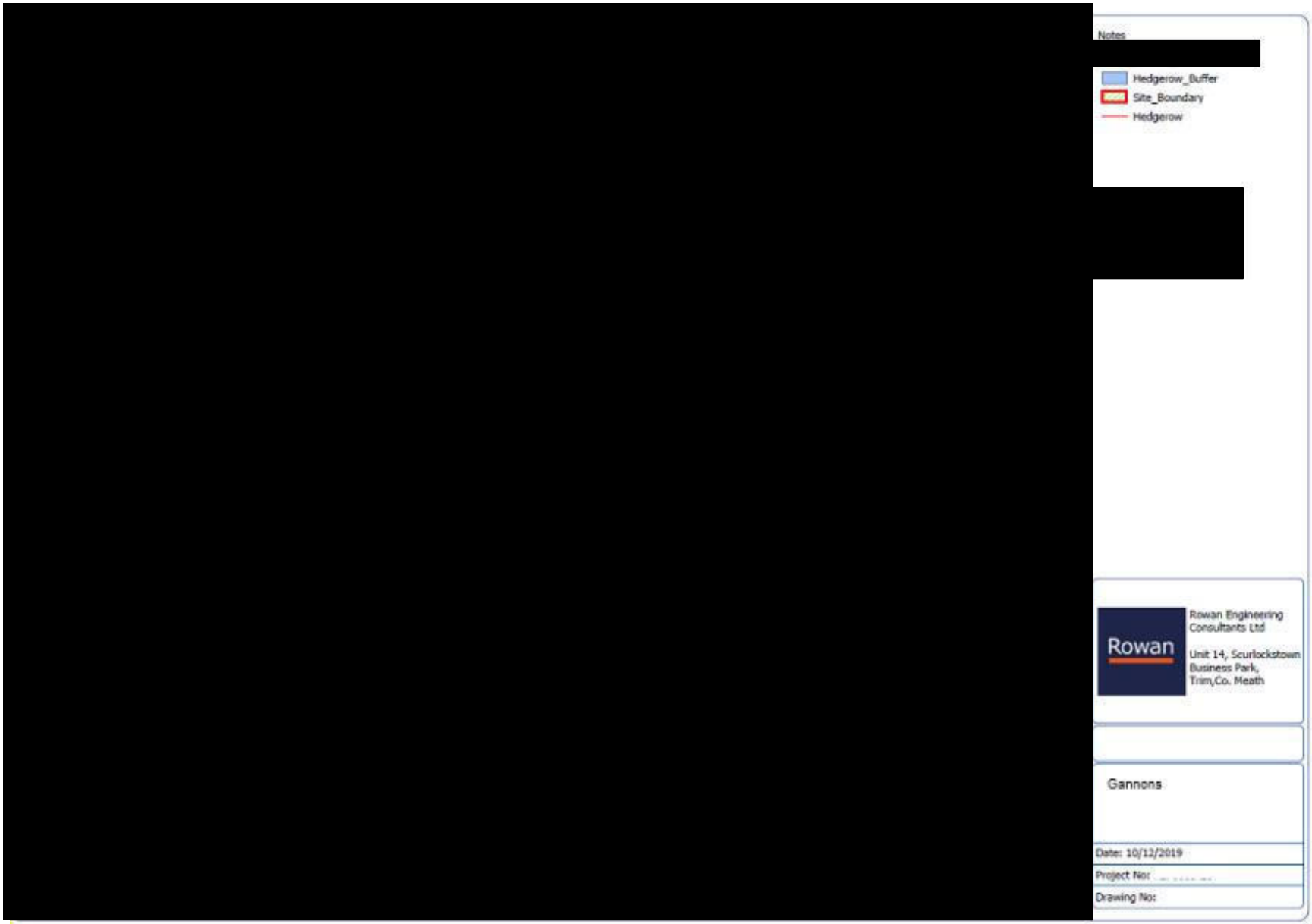
Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 x Cut	2 x Cut Silage

Total Imported P	186.35	Kg P
Total On Farm P	117.32	Kg P
Total P/Ha	20.43	Kg P/Total Useable

Total Imported N	64.65	Kg N
Total On Farm N	873.35	Kg N
Total N/Ha	63.12	Kg N/Total Useable


Notes
Hedgerow_Buffer
Site_Boundary
Hedgerow
Rowan
Rowan Engineering Consultants Ltd
Unit 14, Scurlockstown Business Park, Trim,Co. Meath
Gannons
Date: 10/12/2019
Project No:
Drawing No:

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		2.7	302280	5.3	21/12/2021	3	2 Cut	30	7.39	23.1	22.6	62.3	52.77	8	61	225	100%
		2.6	302281	9	21/12/2021	4	2 Cut	0	7.39	0.0	0.0	0.0	52.77	0	53	225	0%
		5.3								**23.1**	**22.61**	**62.29**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**62**	**MT**
Total usable area:	**5.3**	**Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

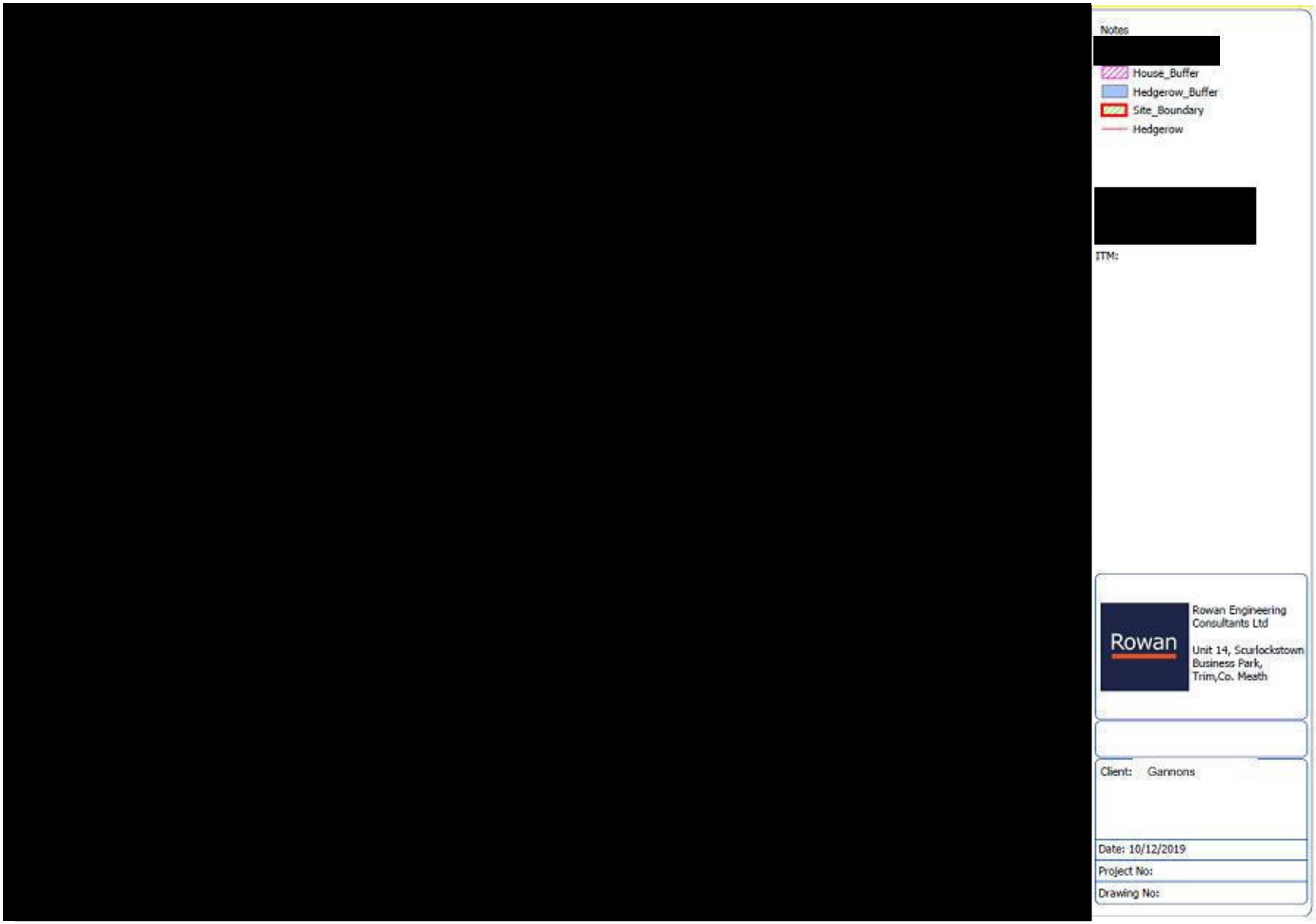
2 x Cut	2 x Cut Silage

On farm N	52.77	Kg N/ha
On farm P	7.39	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	61.05	Kg P
Total On Farm P	39.17	Kg P
Total P/Ha	18.91	Kg P/Total Useable

Total Imported N	21.18	Kg N
Total On Farm N	279.66	Kg N
Total N/Ha	56.76	Kg N/Total Useable


Notes
House_Buffer
Hedgerow_Buffer
Site_Boundary
Hedgerow
ITM:
Rowan
Rowan Engineering Consultants Ltd
Unit 14, Scurlockstown Business Park, Trim,Co. Meath
Client: Gannons
Date: 10/12/2019
Project No:
Drawing No:

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townlands

Field ID No.	Total Area (ha)	Total usable area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)**	Load Factor required due to N limitations
[redacted]		4.36	65	8.5	21/12/2021	4	Grass	0	0.24	0.0	0.0	0.0	52.77	0	53	225	0%
		1.30	66	11.8	21/12/2021	4	Grass	0	0.24	0.0	0.0	0.0	52.77	0	53	225	0%
		12.10	67/68	10.3	21/12/2021	4	Grass	0	0.24	0.0	0.0	0.0	52.77	0	53	225	0%
		2.26	69	12.6	21/12/2021	4	Grass	0	0.24	0.0	0.0	0.0	52.77	0	53	225	0%
		3.00	70	12.7	21/12/2021	4	Grass	0	0.24	0.0	0.0	0.0	52.77	0	53	225	0%
		3.30	71	11.1	21/12/2021	4	Grass	0	0.24	0.0	0.0	0.0	52.77	0	53	225	0%
		26.3								**0.0**	**0.00**	**0.00**					

*Total available P = (as per Table 15 S.I. No. 605 of 2017) for 2 cut silage)

**Total available N = (as per 20. (1) of S.I. No. 605 of 2017) for 2 cut silage)

Total volume of WWTP Sludge that can be imported on to the farm:	**0 MT**
Total usable area:	**26.3 Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

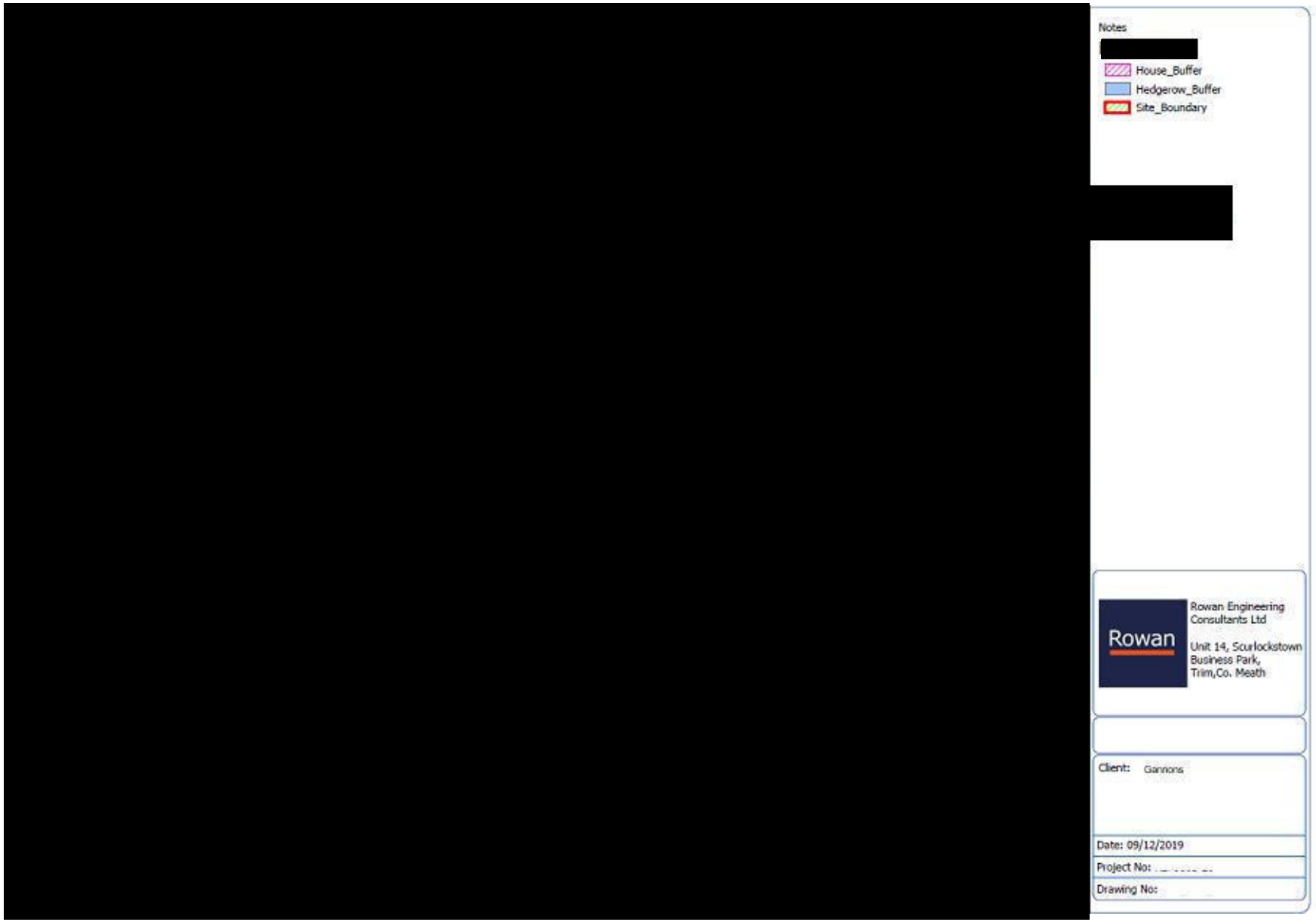
2 x Cut	2 x Cut Silage

Total Imported P	0.00	Kg P
Total On Farm P	194.51	Kg P
Total P/Ha	7.39	Kg P/Total Useable

Total Imported N	0.00	Kg N
Total On Farm N	1,388.81	Kg N
Total N/Ha	52.77	Kg N/Total Useable

On farm N	52.77	Kg N/ha
On farm P	7.39	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed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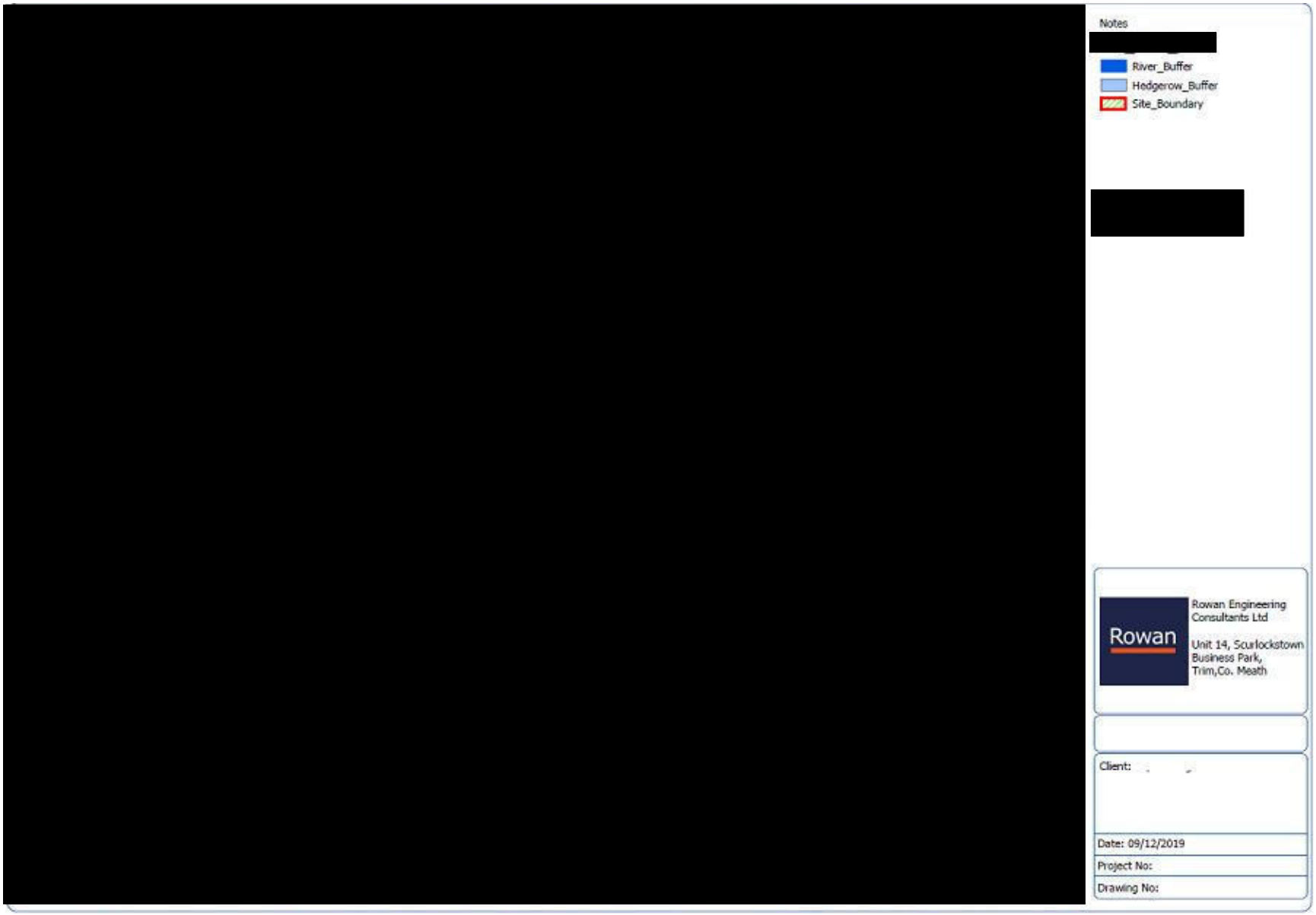
House_Buffer
Hedgerow_Buffer
Site_Boundary
Rowan
Rowan Engineering Consultants Ltd
Unit 14, Scurlockstown Business Park, Trim,Co. Meath
Client: Gannons
Date: 09/12/2019
Project No:
Drawing No: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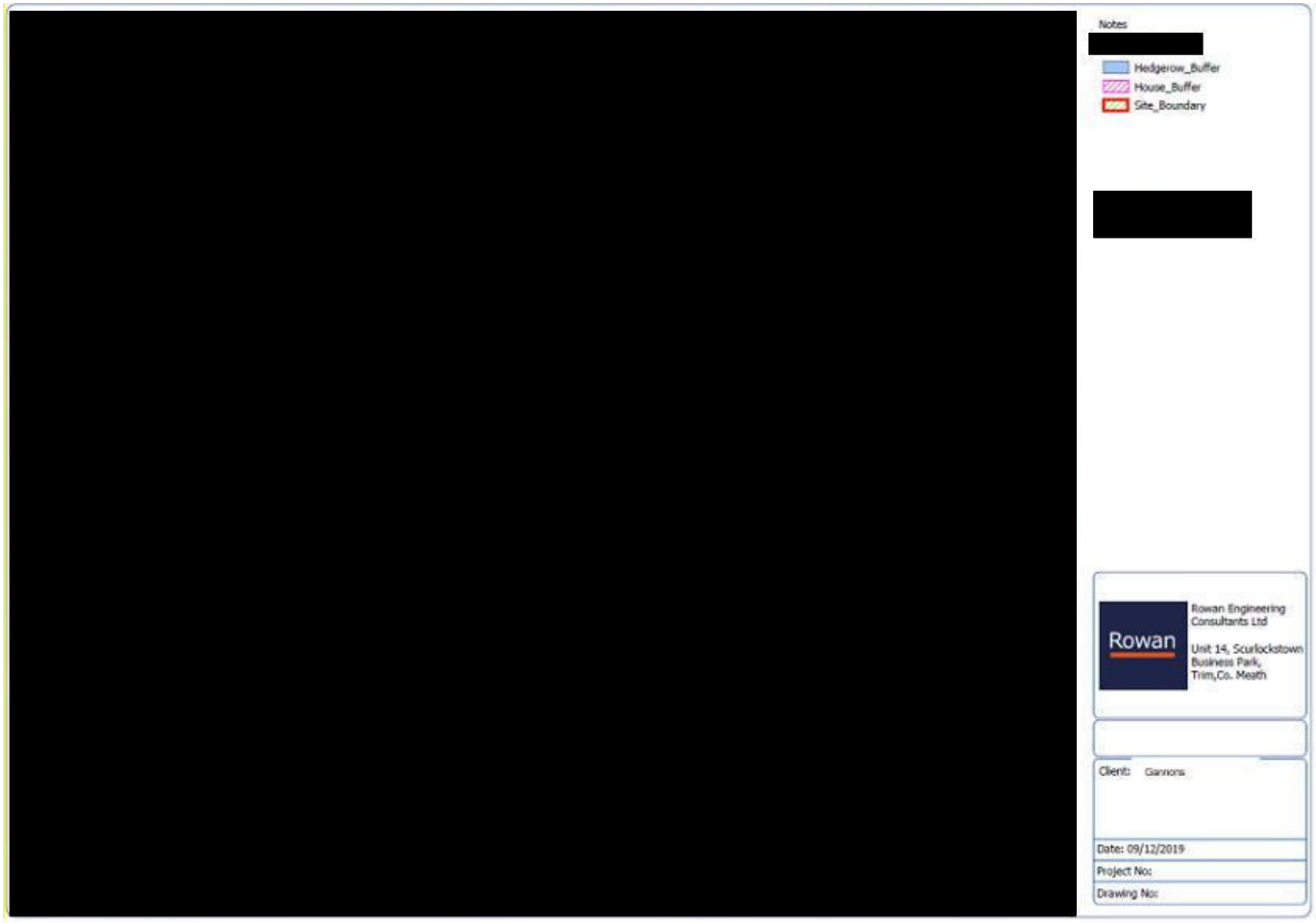
River_Buffer
Hedgerow_Buffer
Site_Boundary
Rowan
Rowan Engineering Consultants Ltd
Unit 14, Scurlockstown Business Park, Trim,Co. Meath
Client:
Date: 09/12/2019
Project No:
Drawing No: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House_Buffer
Site_Boundary
Rowan
Rowan Engineering Consultants Ltd
Unit 14, Scurlockstown Business Park, Trim,Co. Meath
Client: Gannons
Date: 09/12/2019
Project No:
Drawing No:

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townland

Field ID No.	Total Area (ha)	Total Usable Area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)	P in on farm slurry (kg P/ha)****	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha	N required (kg/ha)*	Load Factor required due to N limitations
[redacted]		4.5	303892	0.8	21/12/2021	1	2 Cut	50	10.23	40.6	39.8	181.0	69.62	14	83	225	100%
		4.5	303893	0.6	21/12/2021	1	2 Cut	50	10.23	40.6	39.8	181.0	69.62	14	83	225	100%
		8.9								**81.2**	**79.5**	**362**					

***Total available P (as per Table 15 S.I. No. 605 of 2017) for grassland with 2 cuts of silage.**

****Total available N (as per Table 14 S.I. No. 605 of 2017) for grassland with 2 cuts of silage.**

Total volume of WWTP Sludge that can be imported on to the farm:	**362 MT**
Total usable area:	**8.9 Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

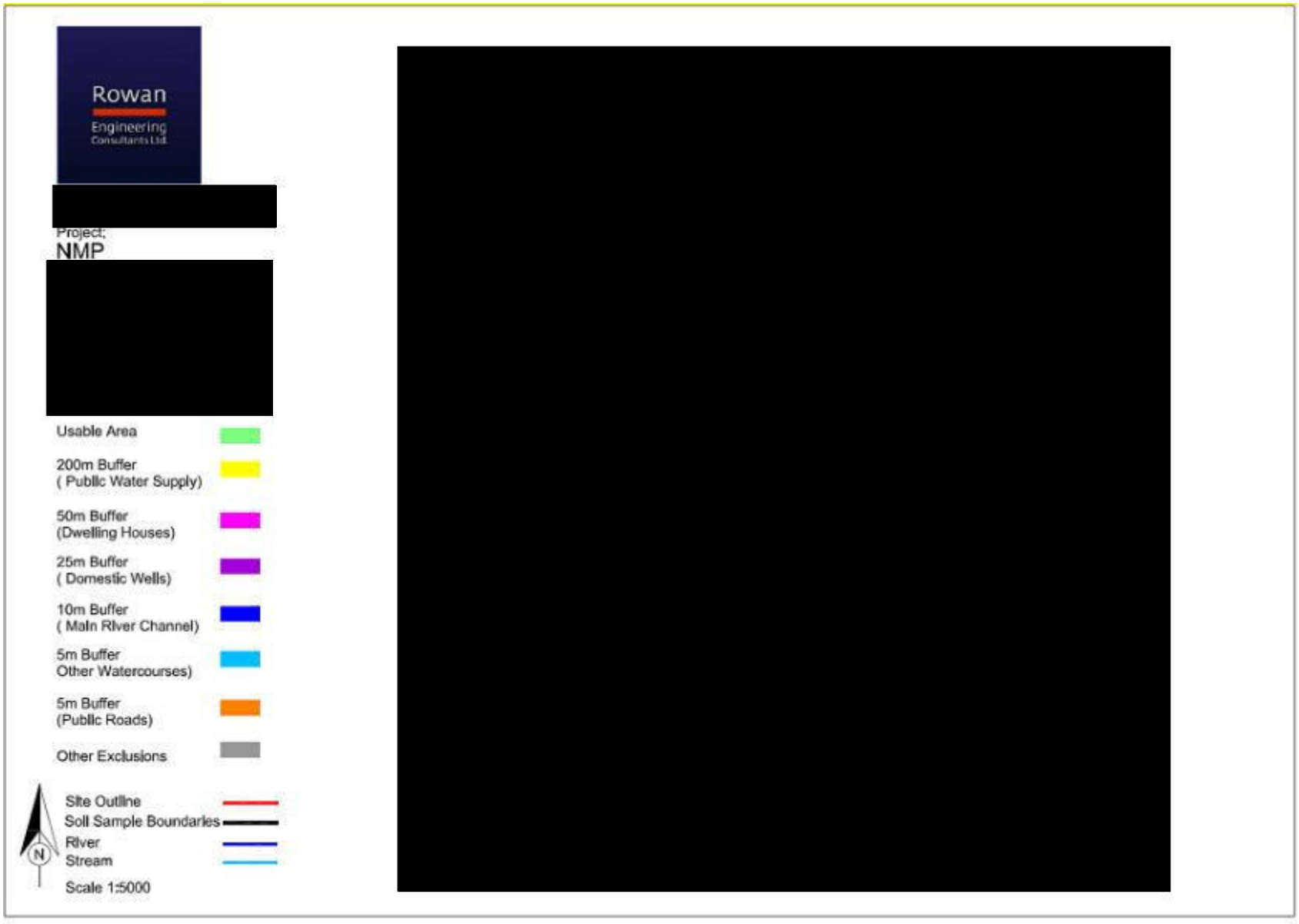
2 Cut	2 Cut Silage

On farm N	69.62	Kg N/ha
On farm P	10.23	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	354.75	Kg P
Total On Farm P	98.00	Kg P
Total P/Ha	47.26	Kg P/Total Useable

Total Imported N	123.08	Kg N
Total On Farm N	667.00	Kg N
Total N/Ha	82.47	Kg N/Total Useable


Rowan
Engineering
Consultants Ltd
[redacted]
Project:
NMP
[redacted]
Usable Area
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling Houses)
25m Buffer
(Domestic Wells)
10m Buffer
(Main River Channel)
5m Buffer
Other Watercourses)
5m Buffer
(Public Roads)
Other Exclusions
Site Outline
Soil Sample Boundaries
River
Stream
N
Scale 1:5000
[redacted]

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townland

Field ID No.	Total Area (ha)	Total Usable Area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/Ha	Imported N/Ha	Total N/Ha**	N required (kg/ha)*	Load Factor required due to N limitations
[redacted]		6.1	SS74	14.5	20/12/2021	4	G	0	14.17	0.0	0.0	0.0	97.00	0	97	170	0%
		5.4	SS76	11.4	20/12/2021	4	G	0	14.17	0.0	0.0	0.0	97.00	0	97	170	0%
		5.8	SS77	11.7	20/12/2021	4	G	0	14.17	0.0	0.0	0.0	97.00	0	97	170	0%
		2.8	SS78	13	20/12/2021	4	G	0	14.17	0.0	0.0	0.0	97.00	0	97	170	0%
		5.5	SS79	13.5	20/12/2021	4	G	0	14.17	0.0	0.0	0.0	97.00	0	97	170	0%
		5.7	SS80	13.9	20/12/2021	4	G	0	14.17	0.0	0.0	0.0	97.00	0	97	170	0%
		1.9	SS81	15.4	20/12/2021	4	G	0	14.17	0.0	0.0	0.0	97.00	0	97	170	0%
		33.2								**0.0**	**0.0**	**0**					

*Total available P = (as per Table 13A S.I. No. 605 of 2017) for grassland <85 kg/ha/year.

**Total available N = (as per Table 12 S.I. No. 605 of 2017) for grassland <170kg/ha/year.

Total volume of WWTP Sludge that can be imported on to the farm:	**0**	**MT**
Total usable area:	**33.2**	**Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

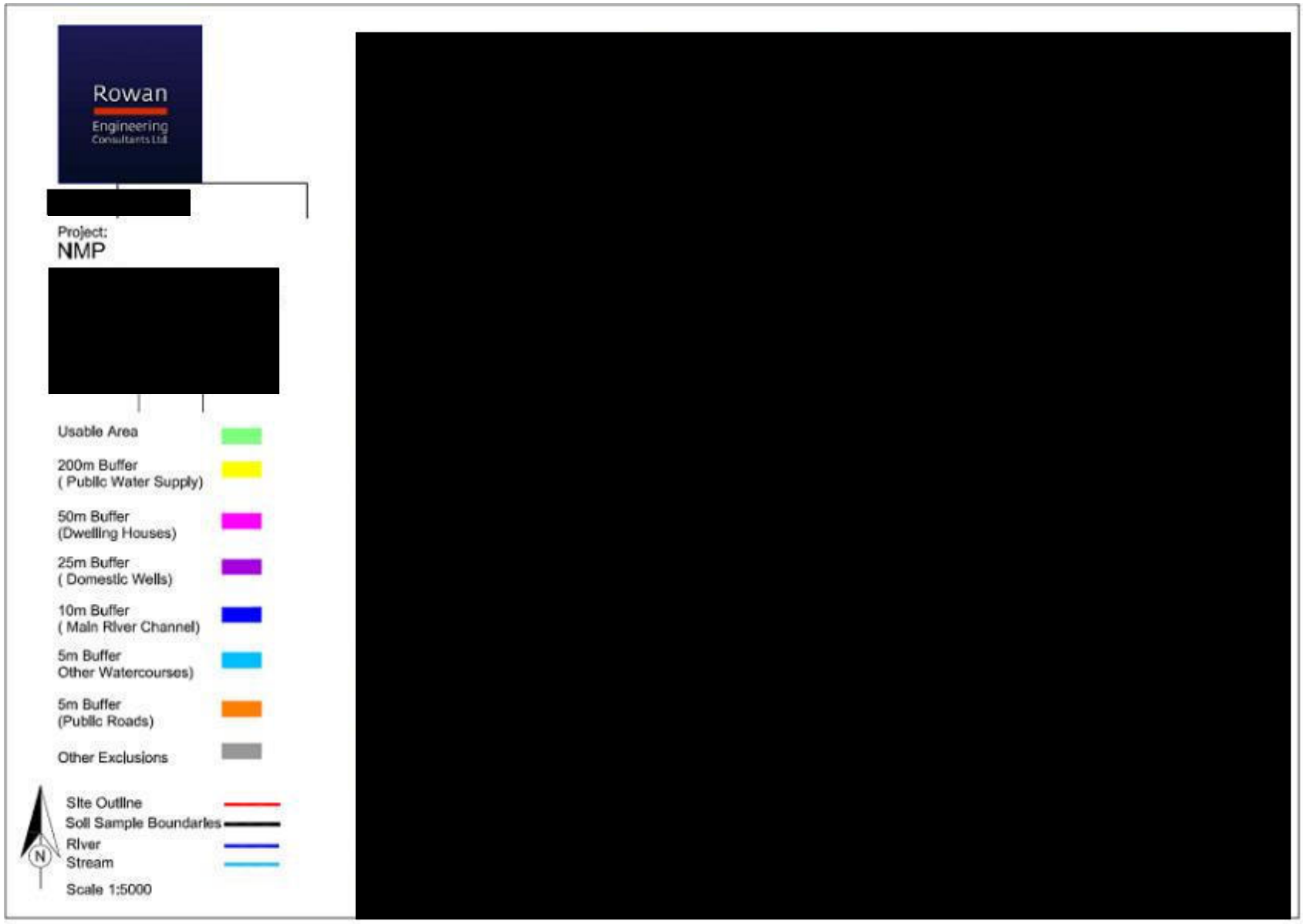
G	Grassland

On farm N	97.00	Kg N/ha
On farm P	14.17	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	0.00	Kg P
Total On Farm P	520.00	Kg P
Total P/Ha	14.17	Kg P/Total Useable

Total Imported N	0.00	Kg N
Total On Farm N	3,560.00	Kg N
Total N/Ha	97.00	Kg N/Total Useable


Rowan
Engineering
Consultants Ltd
[redacted]
Project:
NMP
[redacted]
Usable Area
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling Houses)
25m Buffer
(Domestic Wells)
10m Buffer
(Main River Channel)
5m Buffer
Other Watercourses)
5m Buffer
(Public Roads)
Other Exclusions
Site Outline
Soil Sample Boundaries
River
Stream
N
Scale 1:5000
[redacted]

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townland

Field ID No.	Total Area (ha)	Total Usable Area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha**	N required (kg/ha)*	Load Factor required due to N limitations
[redacted]		4.7	SS82	11.2	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		5.1	SS83	13.8	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		5.1	SS84	15.1	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		5.1	SS85	12.2	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		5.1	SS86	13.5	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		5.1	SS87	9.6	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		5.1	SS88	15.5	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		5.1	SS89	14.5	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		5.1	SS90	11.9	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		7.5	SS91	9.1	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		7.5	SS92	10.5	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		60.5								**0.0**	**0**	**0**					

*Total available P= (as per Table 15 S.I. No. 605 of 2017) for grassland with 2 cuts of silage.

**Total available N= (as per Table 14 S.I. No. 605 of 2017) for grassland with 2 cuts of silage.

Total volume of WWTP Sludge that can be imported on to the farm:	**0**	**MT**
Total usable area:	**60.5**	**Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

2 Cut	2 Cut Silage

On farm N	0.00	Kg N/ha
On farm P	0.00	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	0.00	Kg P
Total On Farm P	0.00	Kg P
Total P/Ha	0.00	Kg P/Total Useable

Total Imported N	0.00	Kg N
Total On Farm N	0.00	Kg N
Total N/Ha	0.00	Kg N/Total Useable


Rowan
Engineering
Consultants Ltd
[redacted]
Project:
NMP
[redacted]
[redacted]
Usable Area
200m Buffer
(Public Water Supply)
50m Buffer
(Dwelling Houses)
25m Buffer
(Domestic Wells)
10m Buffer
(Main River Channel)
5m Buffer
Other Watercourses)
5m Buffer
(Public Roads)
Other Exclusions
Site Outline
Soil Sample Boundaries
River
Stream
N
Scale 1:2500

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townla
nd

Field ID No.	Total Area (ha)	Total Usable Area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha**	N required (kg/ha)*	Load Factor required due to N limitations
[redacted]		3.43	303887	0.8	22/12/2021	1	2 Cut	50	0.00	51.0	50.0	175.0	0.00	17	17	225	100%
		3.59	303888	0.5	22/12/2021	1	2 Cut	50	0.00	51.0	50.0	183.2	0.00	17	17	225	100%
		3.51	303889	0.4	22/12/2021	1	2 Cut	50	0.00	51.0	50.0	179.1	0.00	17	17	225	100%
		2.18	303890	0.7	22/12/2021	1	2 Cut	50	0.00	51.0	50.0	111.2	0.00	17	17	225	100%
		12.7								**204.1**	**200.0**	**648**					

*Total available P= (as per Table 15 S.I. No. 605 of 2017) for grassland with 2 cuts of silage.

**Total available N= (as per Table 14 S.I. No. 605 of 2017) for grassland with 2 cuts of silage.

Total volume of WWTP Sludge that can be imported on to the farm:	**648**	**MT**
Total usable area:	**12.7**	**Hectares**

Concentration of P in Western Brand	0.98	Kg P/MT
Concentration of N in Western Brand	0.34	Kg N/MT

Crop Legend

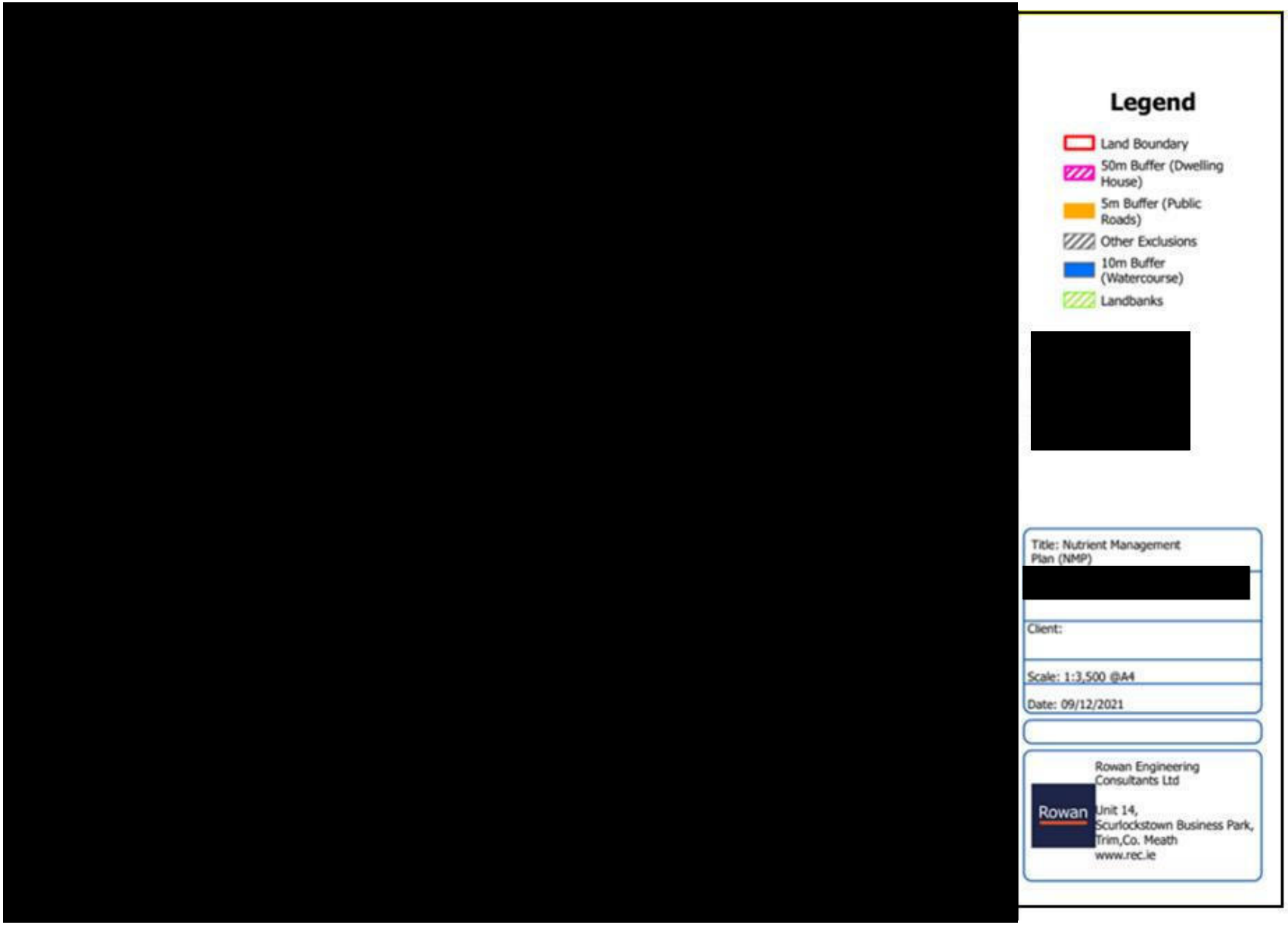
2 Cut	2 Cut Silage

On farm N	0.00	Kg N/ha
On farm P	0.00	Kg P/ha

***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	635.50	Kg P
Total On Farm P	0.00	Kg P
Total P/Ha	50.00	Kg P/Total Useable

Total Imported N	220.48	Kg N
Total On Farm N	0.00	Kg N
Total N/Ha	17.35	Kg N/Total Useable


Legend
Land Boundary
50m Buffer (Dwelling House)
5m Buffer (Public Roads)
Other Exclusions
10m Buffer (Watercourse)
Landbanks
[redacted]
Title: Nutrient Management Plan (NMP)
[redacted]
Client:
Scale: 1:3,500 @A4
Date: 09/12/2021
Rowan Engineering Consultants Ltd
Rowan
Unit 14,
Scurlockstown Business Park,
Trim,Co. Meath
www.rec.ie

Farmer/Land Owner Name [redacted]
Farmer Ref Code
Townland

Field ID No.	Total Area (ha)	Total Usable Area (ha)	Sample	Soil P Test (mg P/l)	Date of Test	P Index	Crop	P required (kg/ha)*	P in on farm slurry (kg P/ha)	Imported organic fertiliser to be applied (MT/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	On Farm N/ha	Imported N/Ha	Total N/Ha**	N required (kg/ha)*	Load Factor required due to N limitations
[redacted]		4.36	SS102	4.7	22/12/2021	2	2 Cut	40	0.00	40.8	40.0	178.0	0.00	14	14	225	100%
		1.8	SS105	10.3	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		2.8	SS102	4.3	22/12/2021	2	2 Cut	40	0.00	40.8	40.0	114.3	0.00	14	14	225	100%
		2.91	SS107	7.9	22/12/2021	3	2 Cut	30	0.00	30.6	30.0	89.1	0.00	10	10	225	100%
		4.96	SS109	12.8	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		3.55	SS108	10.6	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		3.6	SS106	7.8	22/12/2021	3	2 Cut	30	0.00	30.6	30.0	110.2	0.00	10	10	225	100%
		3.64	SS104	5.9	22/12/2021	3	2 Cut	30	0.00	30.6	30.0	111.4	0.00	10	10	225	100%
		2.39	SS109	12.8	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		3.24	SS110	10.4	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		1.59	SS101	5.2	22/12/2021	3	2 Cut	30	0.00	30.6	30.0	48.7	0.00	10	10	225	100%
		3.73	SS98	17.4	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		5.56	SS99	17.3	22/12/2021	4	2 Cut	0	0.00	0.0	0.0	0.0	0.00	0	0	225	0%
		3.44	SS100	4.5	22/12/2021	2	2 Cut	40	0.00	40.8	40.0	140.4	0.00	14	14	225	100%
		47.6								**244.9**	**240.0**	**792**					

*Total available P= (as per Table 15 S.I. No. 605 of 2017) for grassland with 2 cuts of silage.

**Total available N= (as per Table 14 S.I. No. 605 of 2017) for grassland with 2 cuts of silage.

Total volume of WWTP Sludge that can be imported on to the farm:	**792**	**MT**
Total usable area:	**47.6**	**Hectares**

Concentration of P in Western Brand WWTP Sludge	0.98	Kg P/MT
Concentration of N in Western Brand WWTP Sludge	0.34	Kg N/MT

Crop Legend

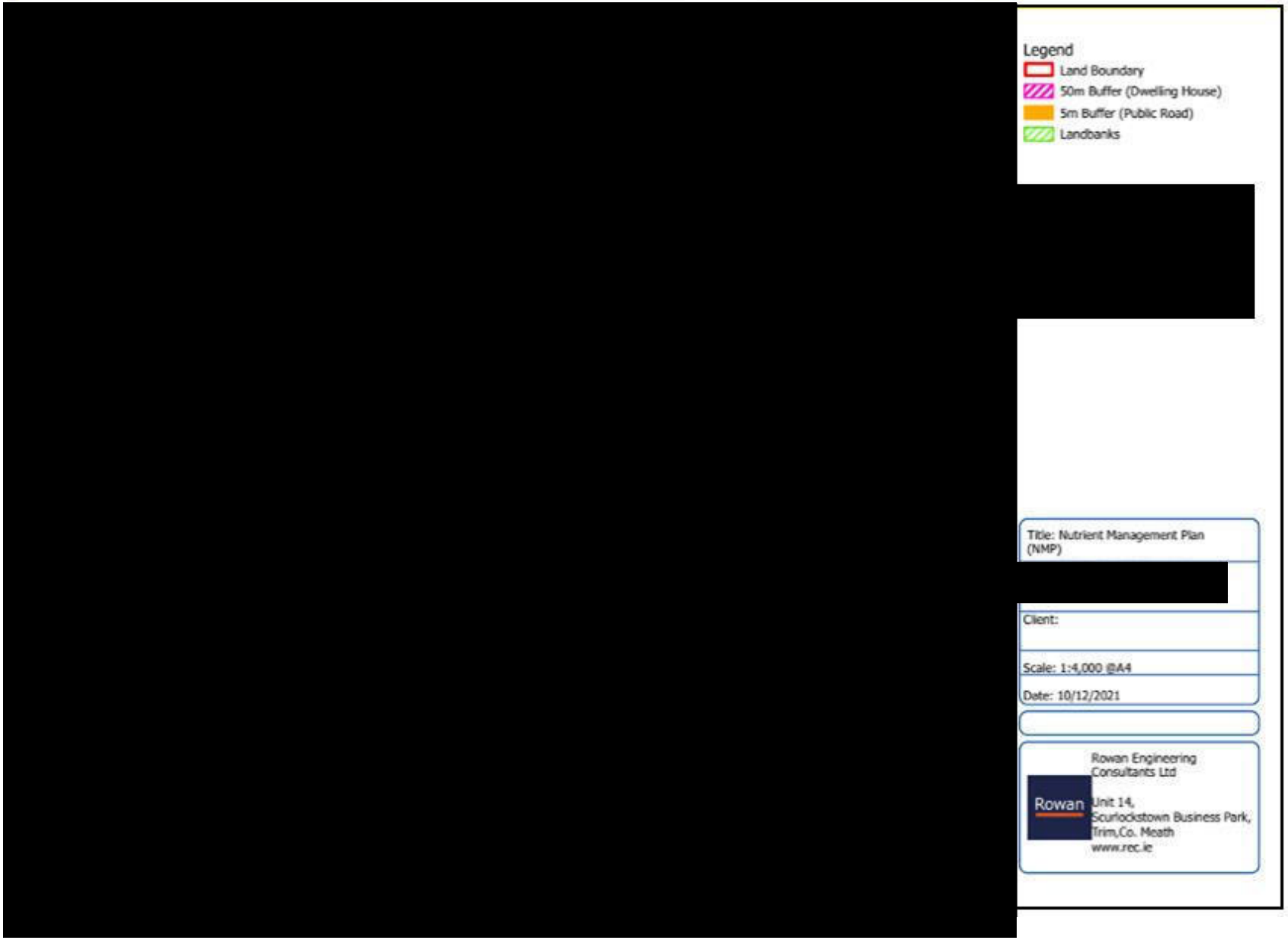
2 Cut	2 Cut Silage

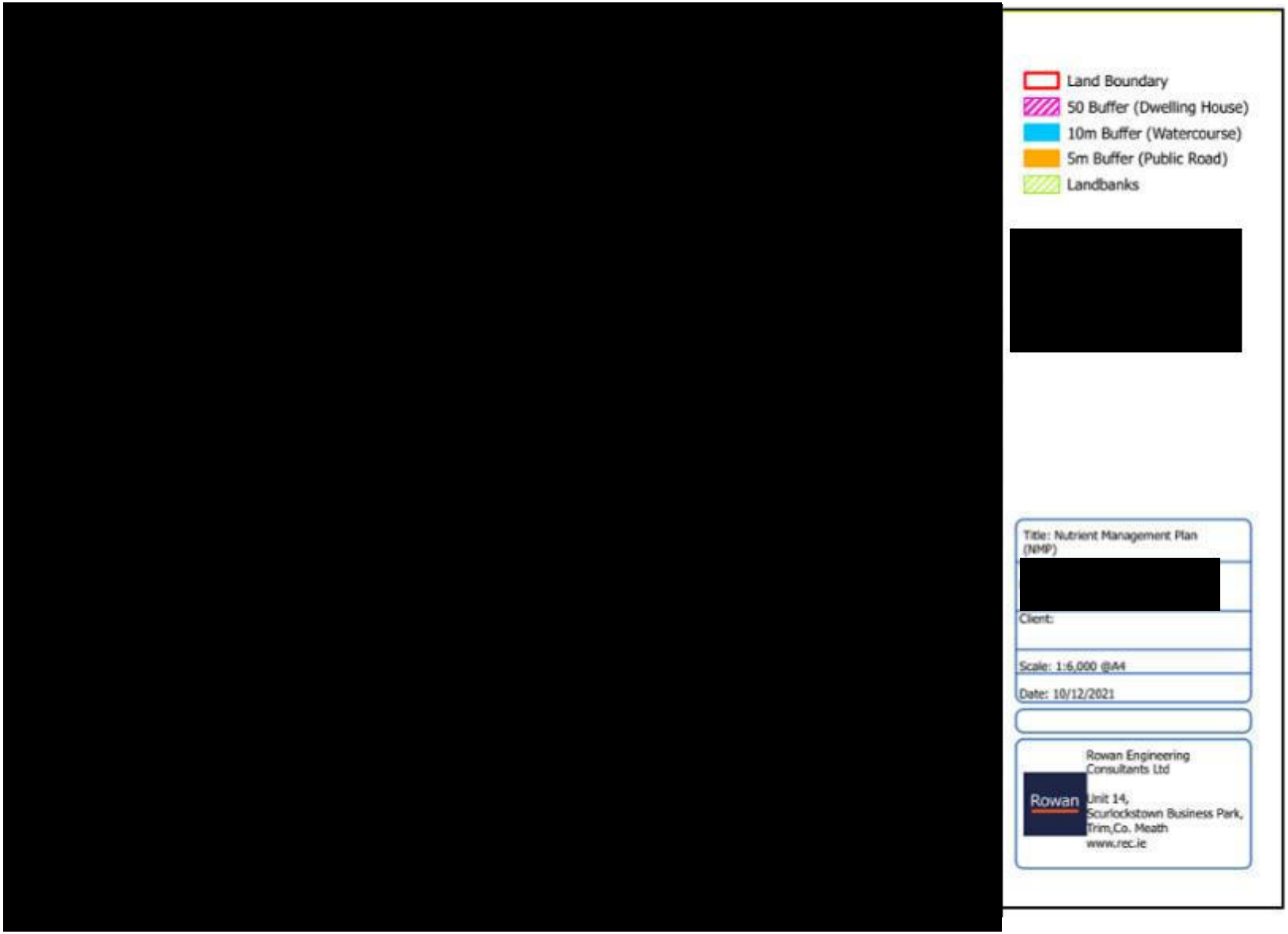
On farm N	0.00	Kg N/ha
On farm P	0.00	Kg P/ha

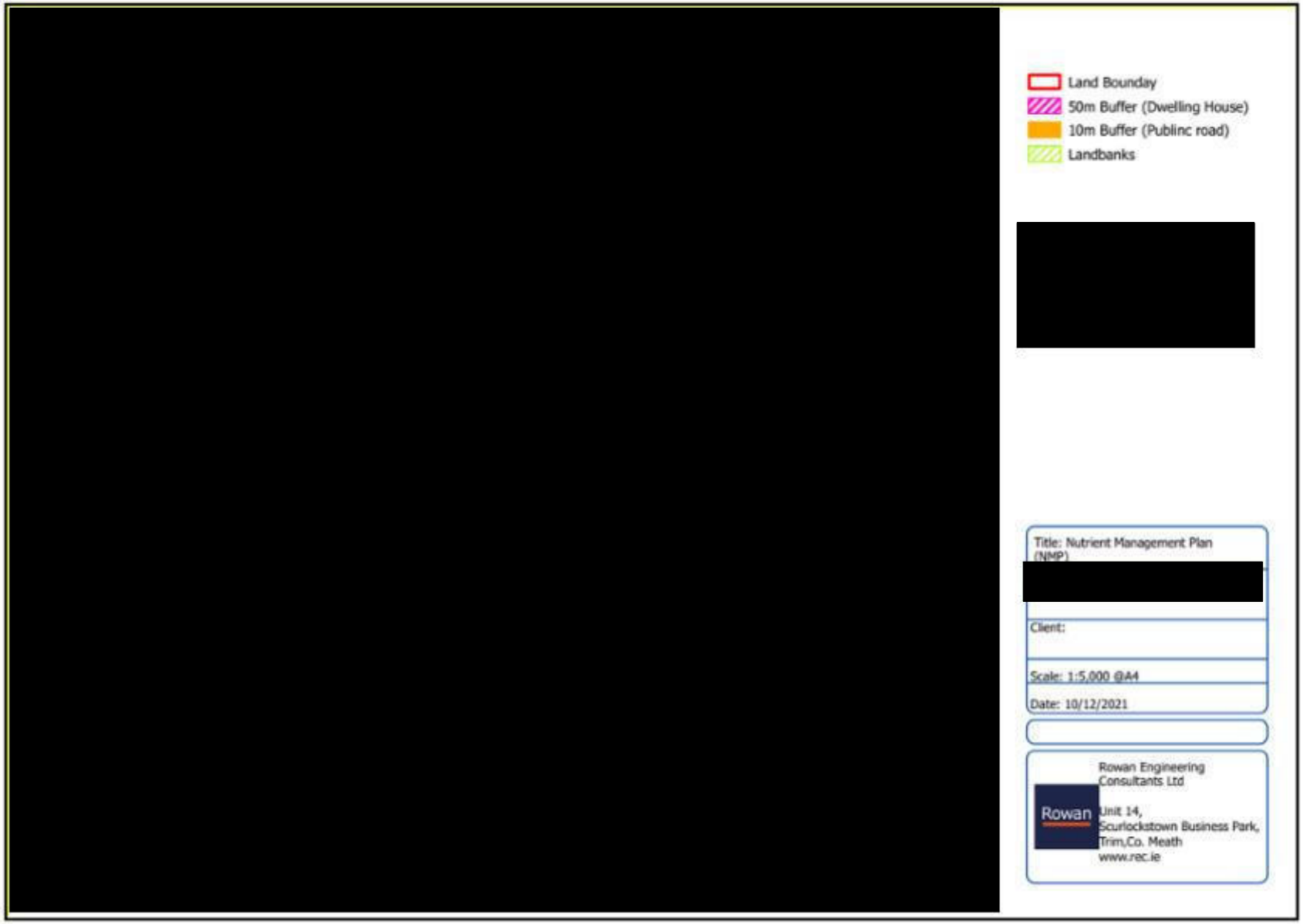
***On farm N&P calculated using N&P production figure and total area farmed

Total Imported P	776.20	Kg P
Total On Farm P	0.00	Kg P
Total P/Ha	16.32	Kg P/Total Useable

Total Imported N	269.29	Kg N
Total On Farm N	0.00	Kg N
Total N/Ha	5.66	Kg N/Total Useable


Legend
Land Boundary
50m Buffer (Dwelling House)
5m Buffer (Public Road)
Landbanks
Title: Nutrient Management Plan (NMP)
Client:
Scale: 1:4,000 @A4
Date: 10/12/2021
Rowan Engineering Consultants Ltd
Unit 14,
Scurlockstown Business Park,
Trim,Co. Meath
www.rec.ie


Land Boundary
50 Buffer (Dwelling House)
10m Buffer (Watercourse)
5m Buffer (Public Road)
Landbanks
[redacted]
Title: Nutrient Management Plan (NMP)
[redacted]
Client:
Scale: 1:6,000 @A4
Date: 10/12/2021
Rowan Engineering Consultants Ltd
Rowan
Unit 14,
Scurlockstown Business Park,
Trim,Co. Meath
www.rec.ie


Land Boundary
50m Buffer (Dwelling House)
10m Buffer (Publinc road)
Landbanks
[redacted]
Title: Nutrient Management Plan (NMP)
[redacted]
Client:
Scale: 1:5,000 @A4
Date: 10/12/2021
Rowan Engineering Consultants Ltd
Rowan
Unit 14,
Scurlockstown Business Park,
Trim,Co. Meath
www.rec.ie

Appendix C: Sludge Analysis 2022

Complete Laboratory Solutions
[Tel] 091 574355
[Fax] 091 574356
[Email] services@cls.ie
[web] www.cls.ie

CERTIFICATE OF ANALYSIS

Client : Colm Drugan (Environmental Manager)
Western Brand Group
Knock Road
Ballyhaunis
Co. Mayo

Report No. : 502912
Date of Receipt : 26/10/2022
Start Date of Analysis : 26/10/2022
Date of Report : 14/11/2022
Order Number : 49467
Sample taken by : Client

Lab No	Sample Description	Test	Ref.	Result	Units
1544859	DAF Sludge 26.10.2022	Fats, Oils and Greases	I,R	3518	mg/l
		Total Nitrogen as N	I,R	337	mg/l
		Total Phosphorus as P	I,R	980	mg/l
		Potassium (sludge)	S	6010	mg/kg dry wt
		% Dry matter	R	5.1	%

Approved by:

AnnMarie Nee
Environmental
Services Administrator

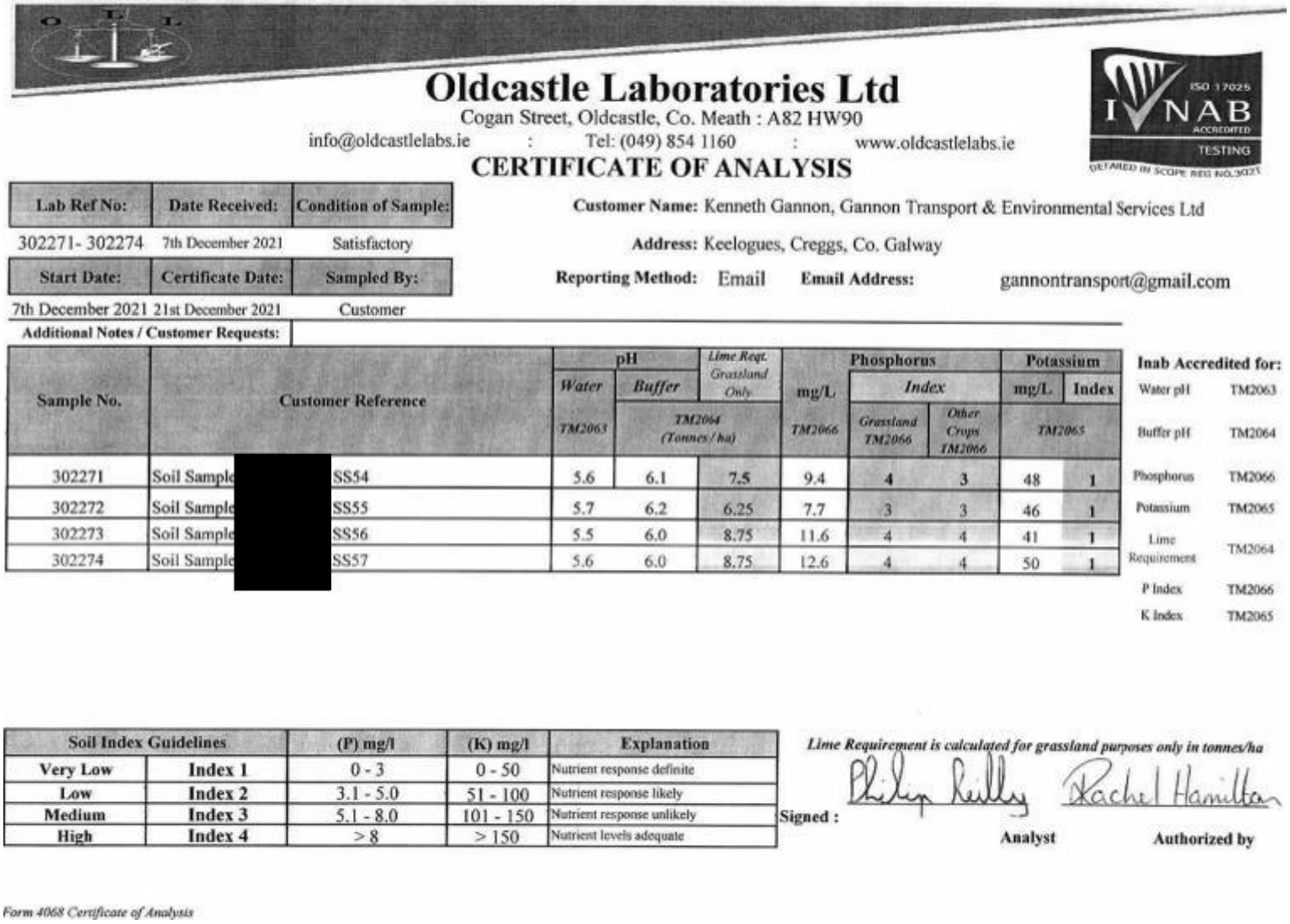
See below for test specifications and accreditation status.
This report only relates to items tested and shall not be reproduced but in full with the permission of CLS.
est. is an estimated count.
CLS will test food, water and swabs samples within 24 hours of receipt.
Where samples have been taken by the Client, results apply to the samples as received.

Complete Laboratory Solutions,
Ros Muc, Connemara,
Co. Galway

Complete Laboratory Solutions (Medpharma),
Unit 3A & Unit 8,
Small Business Park,
Tuam Road, Galway.

Symbol Reference - I:17025 accredited; S:Subcontracted; R:Analysis carried out in Ros Muc; M:Analysis carried out in MedPharma; F:Field test; O:Tested outside hold time.

Appendix D: Certificates of Soil Analysis



Oldcastle Laboratories Ltd
Cogan Street, Oldcastle, Co. Meath : A82 HW90
info@oldcastlelabs.ie : Tel: (049) 854 1160 : www.oldcastlelabs.ie

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.3027

CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
302271- 302274	7th December 2021	Satisfactory
Start Date:	**Certificate Date:**	**Sampled By:**
7th December 2021	21st December 2021	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd
Address: Keelogues, Creggs, Co. Galway
Reporting Method: Email **Email Address:** gannontransport@gmail.com
Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH Water TM2063	pH Buffer TM2064 (Tonnes/ha)	Lime Req. Grassland Only TM2064 (Tonnes/ha)	Phosphorus mg/L TM2066	Phosphorus Index Grassland TM2066	Phosphorus Index Other Crops TM2066	Potassium mg/L TM2065	Potassium Index TM2065
302271	Soil Sample [redacted] SS54	5.6	6.1	7.5	9.4	4	3	48	1
302272	Soil Sample [redacted] SS55	5.7	6.2	6.25	7.7	3	3	46	1
302273	Soil Sample [redacted] SS56	5.5	6.0	8.75	11.6	4	4	41	1
302274	Soil Sample [redacted] SS57	5.6	6.0	8.75	12.6	4	4	50	1

Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly (Analyst) Rachel Hamilton (Authorized by)

Form 4068 Certificate of Analysis

Oldcastle Laboratories Ltd

Cogan Street, Oldcastle, Co. Meath : A82 HW90

info@oldcastlelabs.ie : Tel: (049) 854 1160 : www.oldcastlelabs.ie

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 3021

CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
302261- 302270	7th December 2021	Satisfactory
Start Date:	**Certificate Date:**	**Sampled By:**
7th December 2021	21st December 2021	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

Reporting Method: Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH Water TM2063	pH Buffer TM2064 (Tonnes/ha)	Lime Req. Grassland Only TM2064 (Tonnes/ha)	Phosphorus mg/L TM2066	Phosphorus Index Grassland TM2066	Phosphorus Index Other Crops TM2066	Potassium mg/L TM2065	Potassium Index TM2065
302261	Soil Sample [redacted] SS44	5.9	6.4	3.75	4.8	2	2	54	2
302262	Soil Sample [redacted] SS45	5.9	6.4	3.75	5.4	3	2	49	1
302263	Soil Sample [redacted] SS46	6.0	6.4	3.75	6.5	3	3	49	1
302264	Soil Sample [redacted] SS47	5.7	6.2	6.25	5.2	3	2	44	1
302265	Soil Sample [redacted] SS48	6.0	6.4	3.75	7.1	3	3	39	1
302266	Soil Sample [redacted] SS49	5.8	6.3	5	6.7	3	3	48	1
302267	Soil Sample [redacted] SS50	6.1	6.4	3.75	4.3	2	2	58	2
302268	Soil Sample [redacted] SS51	5.9	6.4	3.75	5.6	3	2	54	2
302269	Soil Sample [redacted] SS52	5.9	6.4	3.75	6.4	3	3	54	2
302270	Soil Sample [redacted] SS53	5.8	6.2	6.25	9.5	4	3	55	2

Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly (Analyst) Rachel Hamilton (Authorized by)

FBA | LABORATORIES

Carrigeen Industrial Estate, Cappoquin, Co. Waterford
TEL. 058 52861 FAX. 058 52865
EMAIL: soilanalysis@fba-labs.com www.fba-labs.com

Analysis Report: **SL1164612**

Account [redacted]

Farmer: [redacted]

Attn:Maurice Gannon
Gannon Tranport Environmental Services Ltd
Keelogues, Glenamaddy
Castlerea
Co Galway

Soil Analysis and Fertiliser Guidelines (SR2)
(Mineral Soils)

Sample Receive Date: 31 July 2019
Sample Return Date: 13 August 2019

Sample (Card Number 7295)	Lab Ref.	pH *Water	pH *Buffer	1) Lime Reqt. Tonnes/ha	Soil P *(mg/l)	2) Index G	Index OC	3) Max. P Fertiliser (kg/ha) Grassland	Maize	Cereal	Soil K *(mg/l)	Index	K Fertiliser (kg/ha) Grazing	4) Silage	4) Maize	Cereal
SS 2	1011338	6.3	6.70	0.00	2.3	1	1	27-39	70	45	< 30	1	90	175	250	95
SS 3	1011339	6.4	6.80	0.00	2.6	1	1	27-39	70	45	32	1	90	175	250	95
S S4	1011340	6.4	6.80	0.00	3.9	2	2	17-29	50	35	38	1	90	175	250	95
SS 5	1011341	6.3	6.70	0.00	2.4	1	1	27-39	70	45	32	1	90	175	250	95
SS 6	1011342	6.3	6.70	0.00	2.2	1	1	27-39	70	45	< 30	1	90	175	250	95
SS 7	1011343	6.3	6.70	0.00	2.8	1	1	27-39	70	45	< 30	1	90	175	250	95
SS 8	1011344	6.2	6.60	1.25	2.3	1	1	27-39	70	45	31	1	90	175	250	95
SS 9	1011345	7.0		0.00	6.6	3	3	7-19	40	25	< 30	1	90	175	250	95
SS 10	1011346	6.8		0.00	6.4	3	3	7-19	40	25	40	1	90	175	250	95
SS 11	1011347	6.8		0.00	6.5	3	3	7-19	40	25	32	1	90	175	250	95

1) Target pH 6.5.
2) G = Grassland, OC = Other Crops
3) Maximum P fertiliser includes all inorganic and organic sources of available P as defined in SI No. 605 of 2017.
4) Deduct 40kg/ha of K for each 10 tonnes/ha of slurry.

** Accredited Test Method Reference: pH Water, pH Buffer = CM01: Soil P mg/l and K mg/l = CMO3*

P and K Index values: 1, Purple; 2 and 3, Green; 4, Red

Sample Analysis on dry soil
The results in this report relate directly to the samples supplied to the laboratory
This Analysis Report shall not be reproduced in full, without the written permission of the laboratory
The Laboratory is not responsible for sampling or sample handling prior to sample receipt into FBA

Conor Butler
Laboratory Manager

Page 1 of 1

FBA | LABORATORIES

Carrigeen Industrial Estate, Cappoquin, Co. Waterford
TEL. 058 52861 FAX. 058 52865
EMAIL: soilanalysis@fba-labs.com www.fba-labs.com

Analysis Report: SL1164612

Account No.: [redacted]
Farmer: [redacted]
Attn: [redacted]
Gannon Tranport Environmental Services Ltd
Keelogues, Glenamaddy
Castlerea
Co Galway

Soil Analysis and Fertiliser Guidelines (SR2)
(Mineral Soils)

Sample Receive Date: 31 July 2019
Sample Return Date: 13 August 2019

Sample (Card Number 7295)	Lab Ref.	pH *Water	pH *Buffer	1) Lime Reqt. Tonnes/ha	Soil P *(mg/l)	2) Index G	Index OC	3) Max. P Fertiliser (kg/ha) Grassland	Maize	Cereal	Soil K *(mg/l)	Index	K Fertiliser (kg/ha) Grazing	4) Silage	4) Maize	Cereal
SS 12	1011348	6.5		0.00	2.3	1	1	27-39	70	45	30	1	90	175	250	95
SS 13	1011349	6.5		0.00	3.4	2	2	17-29	50	35	31	1	90	175	250	95
SS 14	1011350	6.3	6.70	0.00	3	1	1	27-39	70	45	35	1	90	175	250	95
SS 15	1011351	6.8		0.00	3.9	2	2	17-29	50	35	38	1	90	175	250	95
SS 16	1011352	6.6		0.00	4.4	2	2	17-29	50	35	33	1	90	175	250	95
SS 17	1011353	6.9		0.00	5.1	3	2	7-19	50	35	< 30	1	90	175	250	95
SS 18	1011354	6.8		0.00	5.2	3	2	7-19	50	35	48	1	90	175	250	95
SS 19	1011355	7.0		0.00	3.5	2	2	17-29	50	35	36	1	90	175	250	95
SS 20	1011356	7.1		0.00	6.5	3	3	7-19	40	25	32	1	90	175	250	95

1) Target pH 6.5.
2) G = Grassland, OC = Other Crops
3) Maximum P fertiliser includes all inorganic and organic sources of available P as defined in SI No. 605 of 2017.
4) Deduct 40kg/ha of K for each 10 tonnes/ha of slurry.
** Accredited Test Method Reference: pH Water, pH Buffer = CM01: Soil P mg/l and K mg/l = CMO3*

P and K Index values: 1, Purple; 2 and 3, Green; 4, Red

Sample Analysis on dry soil
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Conor Butler
Laboratory Manager

Page 1 of 1

FBA | LABORATORIES

Carrigeen Industrial Estate, Cappoquin, Co. Waterford
TEL. 058 52861 FAX. 058 52865
EMAIL: soilanalysis@fba-labs.com www.fba-labs.com

Analysis Report: **SL1164613**

Account N

Farmer: [redacted]

Attn:Maurice Gannon
Gannon Tranport Environmental Services Ltd
Keelogues, Glenamaddy
Castlerea
Co Galway

Soil Analysis and Fertiliser Guidelines (SR2)
(Mineral Soils)

Sample Receive Date: 31 July 2019
Sample Return Date: 13 August 2019

Sample (Card Number 7297)	Lab Ref.	pH *Water	pH *Buffer	1) Lime Reqt. Tonnes/ha	Soil P *(mg/l)	2) Index G	2) Index OC	3) Max. P Fertiliser (kg/ha) Grassland	Maize	Cereal	Soil K *(mg/l)	K Index	K Fertiliser (kg/ha) Grazing	4) Silage	4) Maize	Cereal
SS 21	1011357	6.0	6.50	2.50	6.7	3	3	7-19	40	25	< 30	1	90	175	250	95
SS 22	1011358	6.0	6.50	2.50	6.4	3	3	7-19	40	25	< 30	1	90	175	250	95
SS 23	1011359	5.8	6.30	5.00	6.4	3	3	7-19	40	25	< 30	1	90	175	250	95
SS 24	1011360	5.9	6.40	3.75	6.2	3	3	7-19	40	25	< 30	1	90	175	250	95
SS 28	1011361	6.2	6.60	1.25	7	3	3	7-19	40	25	< 30	1	90	175	250	95
SS 26	1011362	6.0	6.50	2.50	6.1	3	3	7-19	40	25	< 30	1	90	175	250	95
SS 27	1011363	6.1	6.50	2.50	6.1	3	3	7-19	40	25	< 30	1	90	175	250	95
SS 28	1011364	6.1	6.50	2.50	6.3	3	3	7-19	40	25	< 30	1	90	175	250	95

1) *Target pH 6.5.*
2) *G = Grassland, OC = Other Crops*
3) *Maximum P fertiliser includes all inorganic and organic sources of available P as defined in SI No. 605 of 2017.*
4) *Deduct 40kg/ha of K for each 10 tonnes/ha of slurry.*

** Accredited Test Method Reference: pH Water, pH Buffer = CM01: Soil P mg/l and K mg/l = CMO3*

P and K Index values: 1, Purple; 2 and 3, Green; 4, Red

Sample Analysis on dry soil
The results in this report relate directly to the samples supplied to the laboratory
This Analysis Report shall not be reproduced in full, without the written permission of the laboratory
The Laboratory is not responsible for sampling or sample handling prior to sample receipt into FBA

Conor Butler
Laboratory Manager

Page 1 of 1

Oldcastle Laboratories Ltd

Cogan Street, Oldcastle, Co. Meath : A82 HW90
info@oldcastlelabs.ie : Tel: (049) 854 1160 : www.oldcastlelabs.ie

ISO 17025 INAB ACCREDITED TESTING OBTAINED IN SCOPE REG NO. 3031

CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
302275	7th December 2021	Satisfactory

Start Date:	Certificate Date:	Sampled By:
7th December 2021	21st December 2021	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

Reporting Method: Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH		Lime Reqt. Grassland Only	Phosphorus			Potassium	
		Water	Buffer		mg/L	Index		mg/L	Index
		TM2063	TM2064 (Tonnes/ha)		TM2066	Grassland TM2066	Other Crops TM2066	TM2065	
302275	Soil Sample [redacted] - SS58	5.7	6.1	7.5	15.0	4	4	41	1

Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly (Analyst) Rachel Hamilton (Authorized by)

FBA | LABORATORIES

Carrigeen Industrial Estate, Cappoquin, Co. Waterford
TEL. 058 52861 FAX. 058 52865
EMAIL: soilanalysis@fba-labs.com www.fba-labs.com

Analysis Report: **SL1164614**

Account Number: 58481

Farmer: [redacted]

Attn:Maurice Gannon
Gannon Tranport Environmental Services Ltd
Keelogues, Glenamaddy
Castlerea
Co Galway

Soil Analysis and Fertiliser Guidelines (SR2)
(Mineral Soils)

Sample Receive Date: 31 July 2019
Sample Return Date: 13 August 2019

Sample	Lab Ref.	pH *Water	pH *Buffer	1) Lime Reqt. Tonnes/ha	Soil P *(mg/l)	2) Index G	Index OC	3) Max. P Fertiliser (kg/ha) Grassland	Maize	Cereal	Soil K *(mg/l)	Index	K Fertiliser (kg/ha) Grazing	4) Silage	4) Maize	Cereal
GS 29	1011365	5.9	6.40	3.75	6	3	2	7-19	50	35	< 30	1	90	175	250	95
GS 30	1011366	5.9	6.40	3.75	6.2	3	3	7-19	40	25	< 30	1	90	175	250	95
GS 31	1011367	6.1	6.50	2.50	5.9	3	2	7-19	50	35	< 30	1	90	175	250	95
GS 32	1011368	6.0	6.50	2.50	6.3	3	3	7-19	40	25	< 30	1	90	175	250	95
GS 33	1011369	6.1	6.50	2.50	6.2	3	3	7-19	40	25	< 30	1	90	175	250	95
GS 34	1011370	6.0	6.50	2.50	6.1	3	3	7-19	40	25	< 30	1	90	175	250	95
GS 35	1011371	6.2	6.60	1.25	6.5	3	3	7-19	40	25	< 30	1	90	175	250	95
GS 36	1011372	6.2	6.60	1.25	5.9	3	2	7-19	50	35	< 30	1	90	175	250	95
GS 37	1011373	6.2	6.60	1.25	6.1	3	3	7-19	40	25	< 30	1	90	175	250	95

1) Target pH 6.5.
2) G = Grassland, OC = Other Crops
3) Maximum P fertiliser includes all inorganic and organic sources of available P as defined in SI No. 605 of 2017.
4) Deduct 40kg/ha of K for each 10 tonnes/ha of slurry.
** Accredited Test Method Reference: pH Water, pH Buffer = CM01: Soil P mg/l and K mg/l = CM03*

P and K Index values: 1, Purple; 2 and 3, Green; 4, Red

Sample Analysis on dry soil
The results in this report relate directly to the samples supplied to the laboratory
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Conor Butler
Laboratory Manager

IVNAB TESTING

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FBA | LABORATORIES

Carrigeen Industrial Estate, Cappoquin, Co. Waterford
TEL. 058 52861 FAX. 058 52865
EMAIL: soilanalysis@fba-labs.com www.fba-labs.com

Analysis Report: SL1164615

Account Number: 58481

Farmer: [redacted]

Attn:Maurice Gannon
Gannon Tranport Environmental Services Ltd
Keelogues, Glenamaddy
Castlerea
Co Galway

Soil Analysis and Fertiliser Guidelines (SR2)

(Mineral Soils)

Sample Receive Date: 31 July 2019
Sample Return Date: 13 August 2019

Sample (Card Number 7299)	Lab Ref.	pH *Water	pH *Buffer	1) Lime Reqt. *Tonnes/ha*	Soil P *(mg/l)	2) Index G	Index OC	3) Max. P Fertiliser (kg/ha) Grassland	Maize	Cereal	Soil K *(mg/l)	Index	K Fertiliser (kg/ha) Grazing	4) Silage	4) Maize	Cereal
SS 38	1011374	7.0		0.00	10.1	4	4	NIL	20	20	< 30	1	90	175	250	95
SS 39	1011375	7.0		0.00	11.3	4	4	NIL	20	20	32	1	90	175	250	95
SS 40	1011376	6.9		0.00	10.3	4	4	NIL	20	NIL	< 30	1	90	175	250	95
SS 41	1011377	7.1		0.00	5.5	3	2	7-19	50	35	41	1	90	175	250	95
SS 42	1011378	6.9		0.00	9.9	4	3	NIL	40	25	34	1	90	175	250	95
SS 43	1011379	6.9		0.00	8.2	4	3	NIL	40	25	32	1	90	175	250	95
SS 44	1011380	6.9		0.00	5.3	3	2	7-19	50	35	44	1	90	175	250	95
SS 45	1011381	7.0		0.00	9.3	4	3	NIL	40	25	< 30	1	90	175	250	95

1) *Target pH 6.5.*
2) *G = Grassland, OC = Other Crops*
3) *Maximum P fertiliser includes all inorganic and organic sources of available P as defined in SI No. 605 of 2017.*
4) *Deduct 40kg/ha of K for each 10 tonnes/ha of slurry.*

** Accredited Test Method Reference: pH Water, pH Buffer = CM01: Soil P mg/l and K mg/l = CMO3*

P and K Index values: 1, Purple; 2 and 3, Green; 4, Red

Sample Analysis on dry soil
The results in this report relate directly to the samples supplied to the laboratory
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The Laboratory is not responsible for sampling or sample handling prior to sample receipt into FBA

Conor Butler
Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 3027

CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
302276- 302281	7th December 2021	Satisfactory

Start Date:	Certificate Date:	Sampled By:
7th December 2021	21st December 2021	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

Reporting Method: Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH Water TM2063	pH Buffer TM2064 (Tonnes/ha)	Lime Req. Grassland Only TM2064 (Tonnes/ha)	Phosphorus mg/L TM2066	Phosphorus Index Grassland TM2066	Phosphorus Index Other Crops TM2066	Potassium mg/L TM2065	Potassium Index TM2065
302276	Soil Sample [redacted] SS59	5.4	5.9	10	11.7	4	4	43	1
302277	Soil Sample [redacted] SS60	5.5	6.0	8.75	13.6	4	4	43	1
302278	Soil Sample [redacted] SS61	5.5	6.0	8.75	7.2	3	3	33	1
302279	Soil Sample [redacted] SS62	5.3	5.8	11.25	5.3	3	2	36	1
302280	Soil Sample [redacted] SS63	5.6	6.0	8.75	5.4	3	2	35	1
302281	Soil Sample [redacted] SS64	5.7	6.3	5	9	4	3	39	1

Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly **Analyst** Rachel Hamilton **Authorized by**

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 3021

CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
302282- 302288	7th December 2021	Satisfactory

Start Date:	Certificate Date:	Sampled By:
7th December 2021	21st December 2021	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

Reporting Method: Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH		Lime Reqt. Grassland Only	Phosphorus			Potassium	
		Water	Buffer		mg/L	Index		mg/L	Index
		TM2063	TM2064 (Tonnes / ha)		TM2066	Grassland TM2066	Other Crops TM2066	TM2065	
302282	Soil Sample [redacted] - SS65	5.7	6.2	6.25	8.5	4	3	39	1
302283	Soil Sample [redacted] - SS66	5.6	6.1	7.5	11.8	4	4	38	1
302284	Soil Sample [redacted] - SS67	5.6	6.1	7.5	10.3	4	4	37	1
302285	Soil Sample [redacted] - SS68	5.5	6.0	8.75	12.6	4	4	39	1
302286	Soil Sample [redacted] - SS69	5.3	5.9	10	12.6	4	4	32	1
302287	Soil Sample [redacted] - SS70	5.3	5.8	11.25	12.7	4	4	35	1
302288	Soil Sample [redacted] - SS71	5.3	5.8	11.25	11.1	4	4	33	1

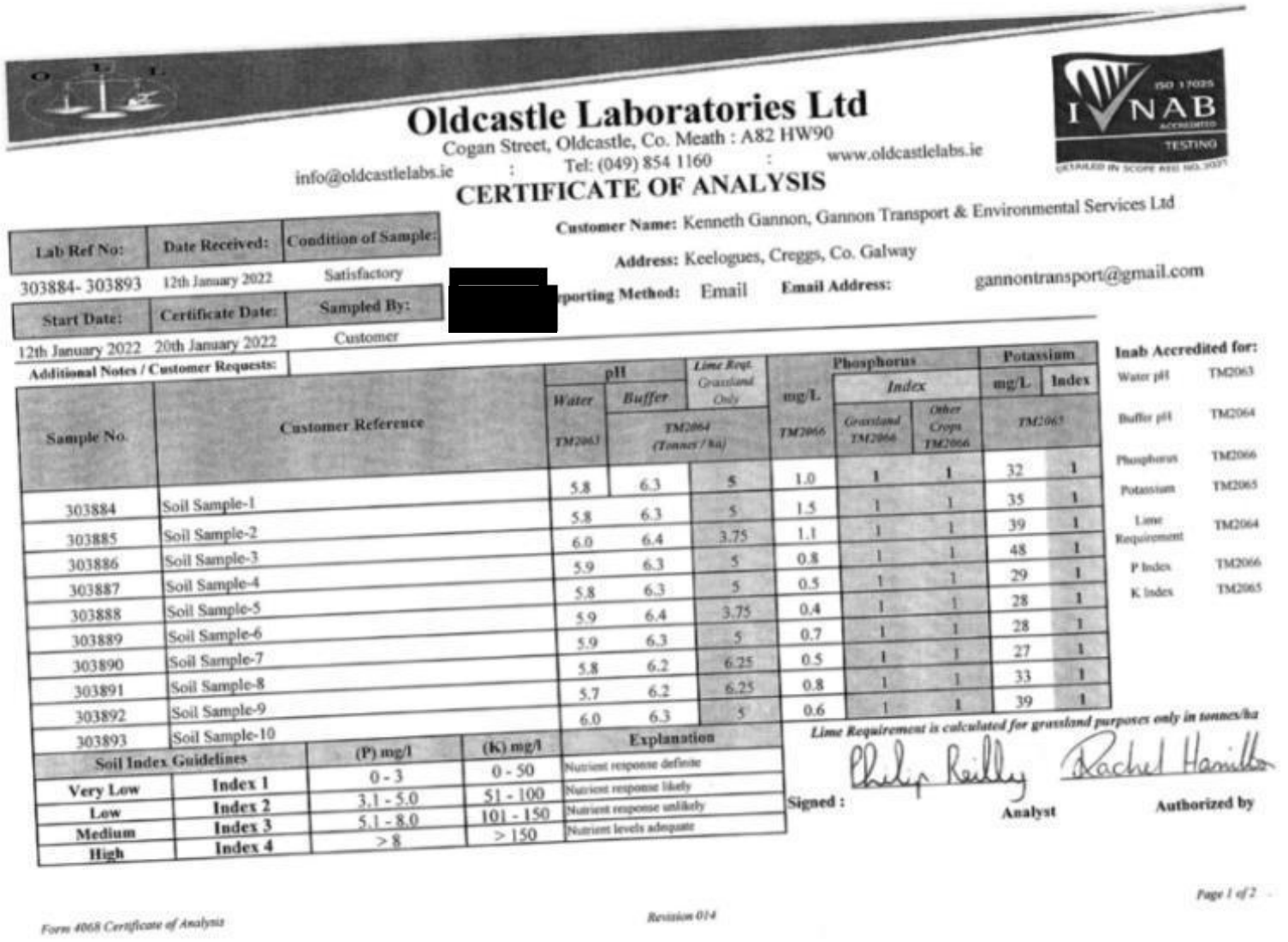
Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly **Analyst** Rachel Hamilton **Authorized by**



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CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
303884- 303893	12th January 2022	Satisfactory

Start Date:	Certificate Date:	Sampled By:
12th January 2022	20th January 2022	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

[redacted] **Reporting Method:** Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH Water TM2063	pH Buffer TM2064	Lime Req. Grassland Only TM2064 (Tonnes / ha)	Phosphorus mg/L TM2066	Phosphorus Index Grassland TM2066	Phosphorus Index Other Crops TM2066	Potassium mg/L TM2065	Potassium Index TM2065
303884	Soil Sample-1	5.8	6.3	5	1.0	1	1	32	1
303885	Soil Sample-2	5.8	6.3	5	1.5	1	1	35	1
303886	Soil Sample-3	6.0	6.4	3.75	1.1	1	1	39	1
303887	Soil Sample-4	5.9	6.3	5	0.8	1	1	48	1
303888	Soil Sample-5	5.8	6.3	5	0.5	1	1	29	1
303889	Soil Sample-6	5.9	6.4	3.75	0.4	1	1	28	1
303890	Soil Sample-7	5.9	6.3	5	0.7	1	1	28	1
303891	Soil Sample-8	5.8	6.2	6.25	0.5	1	1	27	1
303892	Soil Sample-9	5.7	6.2	6.25	0.8	1	1	33	1
303893	Soil Sample-10	6.0	6.3	5	0.6	1	1	39	1

Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly **Analyst** Rachel Hamilton **Authorized by**

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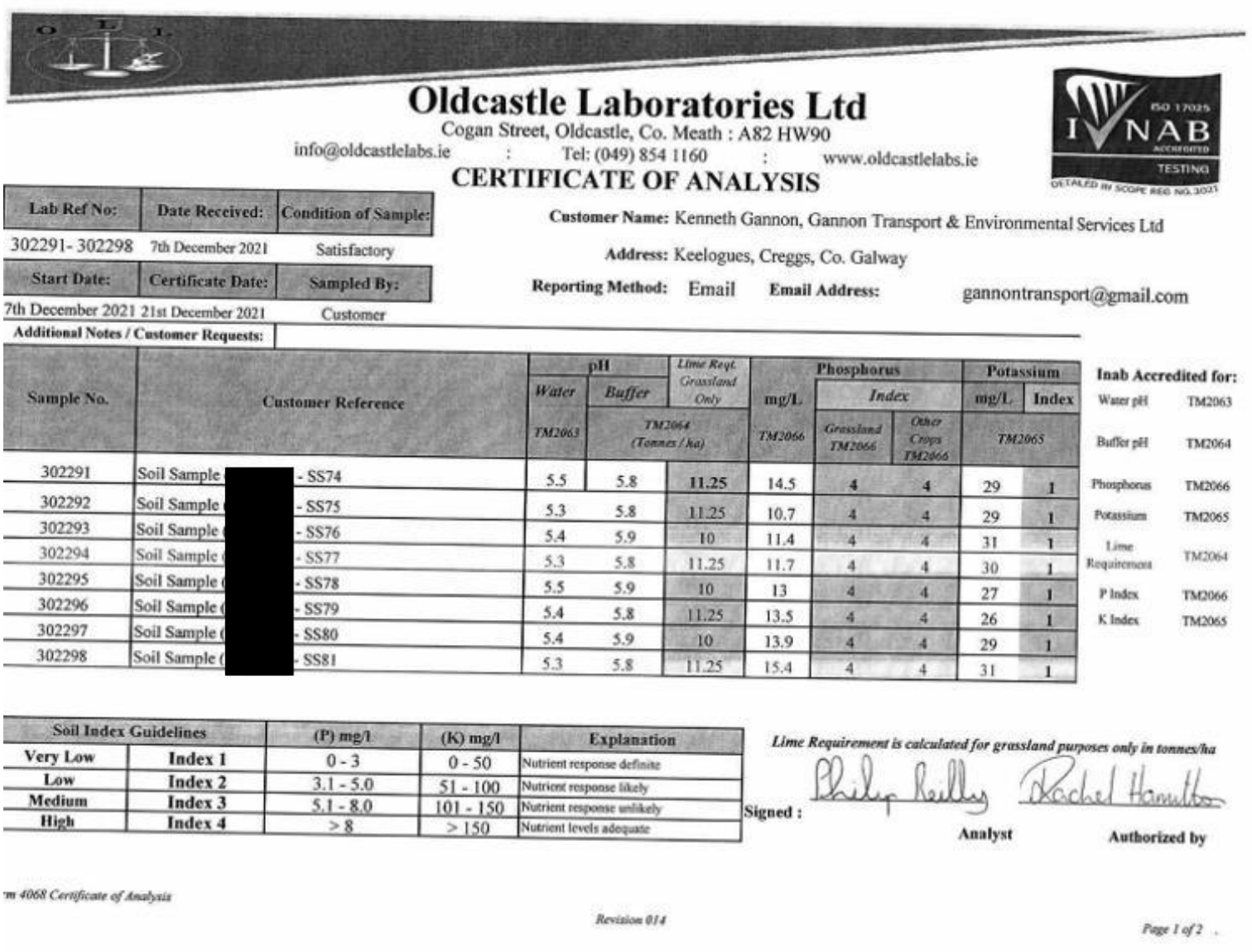

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 3021

CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
302291- 302298	7th December 2021	Satisfactory

Start Date:	Certificate Date:	Sampled By:
7th December 2021	21st December 2021	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

Reporting Method: Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH Water TM2063	pH Buffer TM2064 (Tonnes / ha)	Lime Req. Grassland Only TM2064 (Tonnes / ha)	Phosphorus mg/L TM2066	Phosphorus Index Grassland TM2066	Phosphorus Index Other Crops TM2066	Potassium mg/L TM2065	Potassium Index TM2065
302291	Soil Sample [redacted] - SS74	5.5	5.8	11.25	14.5	4	4	29	1
302292	Soil Sample [redacted] - SS75	5.3	5.8	11.25	10.7	4	4	29	1
302293	Soil Sample [redacted] - SS76	5.4	5.9	10	11.4	4	4	31	1
302294	Soil Sample [redacted] - SS77	5.3	5.8	11.25	11.7	4	4	30	1
302295	Soil Sample [redacted] - SS78	5.5	5.9	10	13	4	4	27	1
302296	Soil Sample [redacted] - SS79	5.4	5.8	11.25	13.5	4	4	26	1
302297	Soil Sample [redacted] - SS80	5.4	5.9	10	13.9	4	4	29	1
302298	Soil Sample [redacted] - SS81	5.3	5.8	11.25	15.4	4	4	31	1

Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly **Analyst** Rachel Hamilton **Authorized by**

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Revision 014

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ISO 17025 INAB ACCREDITED TESTING DETAILS IN SCOPE REG NO. 3021

CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
302299- 302308	7th December 2021	Satisfactory

Start Date:	Certificate Date:	Sampled By:
7th December 2021	22nd December 2021	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

Reporting Method: Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH Water TM2063	pH Buffer TM2064 (Tonnes / ha)	Lime Req. Grassland Only TM2064 (Tonnes / ha)	Phosphorus mg/L TM2066	Phosphorus Index Grassland TM2066	Phosphorus Index Other Crops TM2066	Potassium mg/L TM2065	Potassium Index TM2065
302299	Soil Sampl[redacted]- SS82	5.4	5.9	10	11.2	4	4	37	1
302300	Soil Sampl[redacted]- SS83	5.5	6.0	8.75	13.8	4	4	43	1
302301	Soil Sampl[redacted]- SS84	6.4	6.8	0	15.1	4	4	40	1
302302	Soil Sampl[redacted]- SS85	6.4	6.9	0	12.2	4	4	45	1
302303	Soil Sampl[redacted]- SS86	6.5	6.9	0	13.5	4	4	40	1
302304	Soil Sampl[redacted]- SS87	6.3	6.8	0	9.6	4	3	35	1
302305	Soil Sampl[redacted]- SS88	6.2	6.7	0	15.5	4	4	39	1
302306	Soil Sampl[redacted]- SS89	6.4	6.8	0	14.5	4	4	42	1
302307	Soil Sampl[redacted]- SS90	6.4	6.9	0	11.9	4	4	37	1
302308	Soil Sampl[redacted]- SS91	6.5	6.9	0	9.1	4	3	36	1

Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly (Analyst) Rachel Hamilton (Authorized by)

Form 4068 Certificate of Analysis *Revision 014* *Page 1 of 2*

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 302T

CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
302309- 302311	7th December 2021	Satisfactory

Start Date:	Certificate Date:	Sampled By:
7th December 2021	22nd December 2021	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

Reporting Method: Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH Water TM2063	pH Buffer TM2064 (Tonnes/ha)	Lime Req. Grassland Only TM2064 (Tonnes/ha)	Phosphorus mg/L TM2066	Phosphorus Index Grassland TM2066	Phosphorus Index Other Crops TM2066	Potassium mg/L TM2065	Potassium Index TM2065
302309	Soil Sample [redacted] SS92	6.4	6.9	0	10.5	4	4	40	1
302310	Soil Sample [redacted] SS93	6.5	6.9	0	13.5	4	4	48	1
302311	Soil Sample [redacted] SS94	6.4	6.9	0	9.9	4	3	39	1

Inab Accredited for:

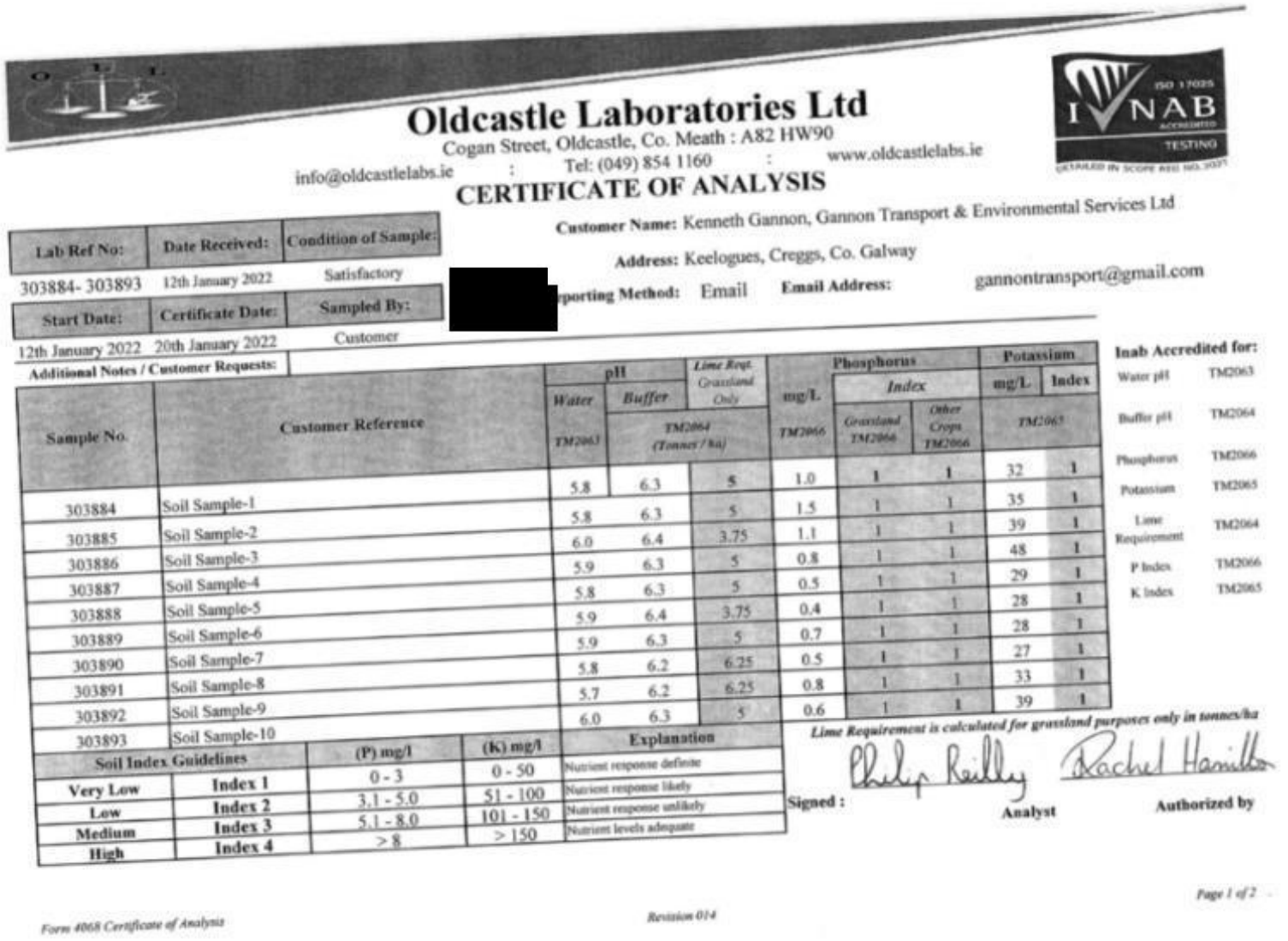
Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly (Analyst) Rachel Hamilton (Authorized by)

Form 4068 Certificate of Analysis *Revision 014* *Page 1 of 2*



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CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
303884- 303893	12th January 2022	Satisfactory

Start Date:	Certificate Date:	Sampled By:
12th January 2022	20th January 2022	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

[redacted] **Reporting Method:** Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH Water TM2063	pH Buffer TM2064	Lime Req. Grassland Only TM2064 (Tonnes / ha)	Phosphorus mg/L TM2066	Phosphorus Index Grassland TM2066	Phosphorus Index Other Crops TM2066	Potassium mg/L TM2065	Potassium Index TM2065
303884	Soil Sample-1	5.8	6.3	5	1.0	1	1	32	1
303885	Soil Sample-2	5.8	6.3	5	1.5	1	1	35	1
303886	Soil Sample-3	6.0	6.4	3.75	1.1	1	1	39	1
303887	Soil Sample-4	5.9	6.3	5	0.8	1	1	48	1
303888	Soil Sample-5	5.8	6.3	5	0.5	1	1	29	1
303889	Soil Sample-6	5.9	6.4	3.75	0.4	1	1	28	1
303890	Soil Sample-7	5.9	6.3	5	0.7	1	1	28	1
303891	Soil Sample-8	5.8	6.2	6.25	0.5	1	1	27	1
303892	Soil Sample-9	5.7	6.2	6.25	0.8	1	1	33	1
303893	Soil Sample-10	6.0	6.3	5	0.6	1	1	39	1

Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly **Analyst** Rachel Hamilton **Authorized by**

Page 1 of 2

Form 4068 Certificate of Analysis *Revision 014*

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO. 3021

CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
302315- 302323	7th December 2021	Satisfactory

Start Date:	Certificate Date:	Sampled By:
7th December 2021	22nd December 2021	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

Reporting Method: Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH		Lime Req. Grassland Only	Phosphorus			Potassium	
		Water	Buffer		mg/L	Index		mg/L	Index
		TM2063	TM2064 (Tonnes / ha)		TM2066	Grassland TM2066	Other Crops TM2066	TM2065	
302315	Soil Sample [redacted] - SS98	6.5	6.9	0	17.2	4	4	49	1
302316	Soil Sample [redacted] - SS99	6.4	6.9	0	17.3	4	4	41	1
302317	Soil Sample [redacted] - SS100	5.9	6.2	6.25	4.5	2	2	32	1
302318	Soil Sample [redacted] SS101	5.6	6.1	7.5	5.2	3	2	41	1
302319	Soil Sample [redacted] - SS102	5.8	6.2	6.25	4.7	2	2	32	1
302320	Soil Sample [redacted] - SS103	5.7	6.2	6.25	4.3	2	2	28	1
302321	Soil Sample [redacted] - SS104	5.7	6.2	6.25	5.9	3	2	30	1
302322	Soil Sample [redacted] - SS105	5.9	6.4	3.75	10.3	4	4	31	1
302323	Soil Sample [redacted] - SS106	5.9	6.3	5	7.8	3	3	29	1

Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

Soil Index Guidelines		(P) mg/l	(K) mg/l	Explanation
Very Low	Index 1	0 - 3	0 - 50	Nutrient response definite
Low	Index 2	3.1 - 5.0	51 - 100	Nutrient response likely
Medium	Index 3	5.1 - 8.0	101 - 150	Nutrient response unlikely
High	Index 4	> 8	> 150	Nutrient levels adequate

Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly (Analyst) Rachel Hamilton (Authorized by)

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Oldcastle Laboratories Ltd

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ISO 17025 INAB ACCREDITED TESTING OBTAINED IN SCOPE REG NO.3021

CERTIFICATE OF ANALYSIS

Lab Ref No:	Date Received:	Condition of Sample:
302324- 302327	7th December 2021	Satisfactory

Start Date:	Certificate Date:	Sampled By:
7th December 2021	22nd December 2021	Customer

Customer Name: Kenneth Gannon, Gannon Transport & Environmental Services Ltd

Address: Keelogues, Creggs, Co. Galway

Reporting Method: Email **Email Address:** gannontransport@gmail.com

Additional Notes / Customer Requests:

Sample No.	Customer Reference	pH Water TM2063	pH Buffer TM2064 (Tonnes / ha)	Lime Req. Grassland Only TM2064 (Tonnes / ha)	Phosphorus mg/L TM2066	Phosphorus Index Grassland TM2066	Phosphorus Index Other Crops TM2066	Potassium mg/L TM2065	Potassium Index TM2065
302324	Soil Sampl[redacted] SS107	5.8	6.3	5	7.9	3	3	29	1
302325	Soil Sampl[redacted] SS108	5.8	6.2	6.25	10.6	4	4	31	1
302326	Soil Sampl[redacted] SS109	5.5	6.0	8.75	12.8	4	4	30	1
302327	Soil Sampl[redacted] SS110	5.8	6.3	5	10.4	4	4	28	1

Inab Accredited for:

Water pH	TM2063
Buffer pH	TM2064
Phosphorus	TM2066
Potassium	TM2065
Lime Requirement	TM2064
P Index	TM2066
K Index	TM2065

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Lime Requirement is calculated for grassland purposes only in tonnes/ha

Signed : Philip Reilly (Analyst) Rachel Hamilton (Authorized by)

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Appendix E: Sign Off of lands

20th December 2022

To whom it may concern,

I have reviewed the landbanks identified in Western Brand's Nutrient Management Plan 2023 to receive WWTP Sludge from Western Brand during 2023.

The Nutrient Management Plan is enclosed complete with calculations, mapping, aquifer vulnerability risk assessment and the appropriate laboratory certificates. Furthermore, the Fertiliser Plan details a Code of Practice for the landspreading of the WWTP Sludge.

In my professional opinion, organic fertiliser may be used to fertilise any of those farmlands, and the application of organic fertiliser from Western Brand to any of those lands in a quantity identified in the Nutrient Management Plan and manner that complies with the following requirements detailed in the European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2017 and the Code of Practice for the landspreading of the organic material will not cause, and is not likely to cause, significant environmental pollution.

A copy of this Nutrient Management Plan has been made available to all relevant customer farmers to view.

Signed

Eoin Downey
BAgrSc (Hons) in Agri-Environmental Sciences (UCD)
MSc (Hons) in Environmental Technology (UCD)

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