Back Up NMP 2019

Liffey Meats
Back Up Nutrient Management Plan 2019

Landbank Locations:

Drumman, Milltownpass, Lynn, Heathland, Milltown, Gibbonstown & Loughanstown, Co Westmeath

Project Ref:

LIF0001-18

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Consultant:

Ian Douglas

BSc, MSc

Rowan Engineering Consultants Ltd.
Unit 1
Scurlockstown Business Park,
Trim
Co. Meath
Tel: 046-9030102
Web: www.rec.ie
Email: info@rec.ie

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Executive Summary

Typically Liffey Meats send their organic sludges (WWTP Sludge & Paunch) for disposal via Anaerobic Digestion (AD). In a recent audit, the EPA asked for a backup Nutrient Management Plan (NMP) to be prepared so that an alternative disposal route is readily available if the AD plant becomes unavailable. This backup NMP looks at the landspreading of WWTP Sludge and Paunch from Liffey Meats on the following landbanks:

Land Owner	Townlands
GW Agri Contracting	Drumman 11 Milltownpass 13 Lynn 03 Heathland
Charlotte Walsh	Heathland Milltown 01 Lynn 03 Gibbonstown 01 Loughanstown DY1

Summary of Conclusions

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

Liffey Meats expect to generate the following quantities of organic wastes during 2019:

- 2,800MT of WWTP Sludge & Lairage
- 2,200 MT of Paunch (Bellygrass)

In summary the landbanks have been mapped and soil sampled in 2017. Due to the fact that the most recent statutory requirements (S.I. No. 605 of 2017) require soil samples to be completed every 4 years – these results are still valid for use. It has been assumed for the purpose of this NMP that any soils that were not sampled will be deemed 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 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 a max of 6 No. 50MT applications during the open season) shall be applied on the landspreading on landbanks in accordance with S.I. No. 605 of 2017.

The landbanks have a capacity to receive **8,690MT** of WWTP Sludge & Lairage & **2,168MT** of Paunch in 2019. The combined available capacity is sufficient to accept the estimated maximum volume **2,800/MT of WWTP Sludge & Lairage and 2,200/MT of Paunch** to be generated by Liffey Meats during 2019.

A summary of the NMP for 2019 is provided below:

Summary	NMP 2019 Usable Area (ha)	NMP 2019 Capacity MT	Total Volume Produced by Moyvalley Meats MT/Yr.	Land Capacity
WWTP Sludge & Lairage	64.82ha	8,690	2,800	310%
Paunch	34.07ha	2,168	2,200	99%

1. Introduction

1.1 Background

The Back-up NMP 2019 for Liffey, has been prepared to comply with the European Communities (Good Agricultural Practice for Protection of Waters) Regulations 2017 (S.I. No. 605 of 2017) and is consistent with the terms of the plant's EPA Licence.

This NMP relates solely for the management of the WWTP Sludge and Paunch generated at the abattoir.

1.2 NMP Methodology

The NMP has been prepared by Ian Douglas BSc, MSc of Rowan Engineering Consultants Ltd (ROWAN), 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. Collection and Recovery

In the event that the AD facility is not available to accept the organic waste, Liffey Meats would contract out the transport of the organic material off site and the application to land to Anneville Agricultural Services, who have in the past been engaged by Liffey Meats as organic material contractors and all staff will be trained on the Code of Practice as detailed in the Nutrient Management Plan. Anneville Agricultural Services will transport the organic material to the spreading sites in sealed and leak proof trailers. Each trip will carry approximately 20 tonnes of organic material from Liffey Meats to the spreading areas.

The trailers will be tipped in a designated tipping area on the farm of spreading. The organic material will then be loaded into a muck spreader and land spread on the land.

A maximum hydraulic loading per single application shall not exceed, in any period of 42 days, a total quantity of 50MT per hectare. The amount of organic material applied to land will be recorded and filed. All organic material will be spread on this landbank in accordance with this NMP and the Code of Practice for land-spreading.

3. Organic Material – Nutrient Value

3.1 WWTP Sludge & Lairage

The sludge is a composite sludge, comprising of 89% WWTP sludge and 11% lairage solids. The nutrient values are in effect, weighted values reflecting the proportions of each.

3.2 Paunch (Bellygrass)

Belly grass is the undigested stomach contents of slaughtered animals. The organic material has high moisture content and has the consistency of stored silage. It is expected that approx. 2,200 MT of Bellygrass will be produced.

3.3 Nutrient Analysis

The organic materials have been analysed and the averages can be seen in Table 1 below.

Parameter	Phosphorus	Potassium	Nitrogen	Dry Matter
WWTP Sludge	0.04%	0.05%	0.09%	1.89%
Lairage	0.06%	0.07%	0.07%	6.47%
89% Sludge/ 11% kg/MT	**0.422**	**0.522**	**0.878**	**2.39%**
Paunch Result	0.06%	0.08%	0.11%	15.03%
Kg/MT	**0.6**	**0.8**	**1.1**	**15.03%**

Table 1: Summary of Nutrient analysis of organic materials in 2019

The Oldcastle Laboratories Ltd certificates of analysis are attached in Appendix B. In addition to the nutrient values, the belly grass organic material has a high humus value, and is an excellent conditioner of the soil providing enrichment and trace elements, which would not otherwise be available using artificial fertiliser.

4. Nutrient Management Plan (NMP)

4.1 Summary

This NMP was prepared to promote the efficient use of nutrients applied to the soil without causing adverse environmental impacts and to promote an optimum soil mineral balance in order to optimise crop production efficiency in terms of 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).

4.2 Methodology

Anneville Agricultural Services were responsible for landbank mapping, soil sampling, obtaining cropping regimes and obtaining the on-farm slurry volumes and nutrient concentrations.

The following information was compiled and collated:

1. Ordnance Survey Maps of the areas intended for the receipt of organic material.
2. The cropping program for the coming year (i.e. harvest of 2019) and previous land use.
3. A chemical analysis of the organic material. The chemical analysis was for the following elements: Nitrogen, Phosphorous, Potassium, % Dry Matter content.
4. Each potential land spread area was assigned a reference number.
5. By reference to the farm map, the current land use and the areas to which the waste is to be applied were identified.
6. A baseline soil fertility survey of the farms was carried out. Soil sampled areas were referenced by plot number from the farm map.
7. The mapping of the soil sample areas were carried out in conjunction with the farmer and was based on soil type, previous fertilization and cropping history.
8. The soil sample areas did not exceed 5 hectares and included a minimum of 20 cores per sample. Soil sample areas with a Morgan's P reading in excess of Index 4 were excluded from the land bank.

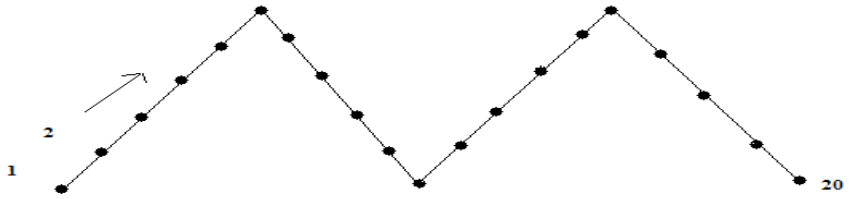
ROWAN compiled and collated the following information for the NMP-

- A desktop aquifer vulnerability risk assessment for the landbanks;
- NMP calculations based on information provided by the Agricultural Consultants and in accordance with European Communities (Good Agriculture Practice for the Protection of Water) Regulations of 2017 (S.I. No. 605 of 2017); and
- Appropriate sign off for the NMP is provided in Appendix D.

4.3 Soil Sampling Procedure

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

1. 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 5 hectares shall be deemed acceptable.
2. Separate samples shall be taken from areas that are different in soil type, previous cropping history, slope, drainage or persistent poor yields.
3. 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.
4. A field shall not be sampled for phosphorus until 3 months after the last application of any fertiliser containing this nutrient (chemical or organic).
5. The sampling pattern shown in the figure 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.
6. The field and sample numbers shall be written/attached onto the soil container.



The following indices and application rates as detailed in S.I. No. 605 of 2017 were used for the NMP calculations.

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 1: Phosphorus Index System

Crop	Nitrogen Index			
	1	2	3	4
	Available Nitrogen (kg/ha)			
Spring Barley [1]	135	110	75	40
Winter Barley	180	155	120	80
Spring Wheat	160	130	95	60
Winter Wheat	210	180	120	80
Maize	180	140	110	75

[1] Where proof of higher yields is available, an additional 20kg N/ha may be applied for each additional tonne above the following yields: Spring Barley – 7.5 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/kg may be applied.

Table 3: Maximum fertilisation rates of Nitrogen on tillage crops

Crop	Phosphorus Index			
	1	2	3	4
	Available Phosphorus (kg/ha)[1]			
Spring Barley	45	35	25	0
Winter Barley	45	35	25	0
Spring Wheat	45	35	25	0
Winter Wheat	45	35	25	0
Maize	70	50	40	20[2]

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

[2] Must be incorporated prior to or during sowing.

Table 4: Maximum fertilisation rates of Phosphorus on tillage crops

5. Aquifer Vulnerability Assessment

5.1 Introduction

All landbanks have been previously approved by the Agency for landspreading. ROWAN as part of the NMP were requested by Liffey Meats to undertake an aquifer vulnerability assessment for the farm landbanks proposed for use.

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 the table in Figure 2 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 3 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 2: GSI Vulnerability classification

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

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 3: Response Matrix for Landspreading

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 4: Response Matrix Key

5.3 Landbank Assessment

1. GW Agri Contracting Ltd & Charlotte Walshe - Heathland and Kilpatrick

Location: The landbanks managed by GW Agri Contracting Ltd and Charlotte Walshe is situated in the townlands of Heathland and Kilpatrick (Corkaree By), Co. Westmeath. It is located c.1.6km southwest of Multyfarnham, Co. Westmeath. The landbank consists of 8 No. tillage landbanks with a total useable land area of 37.82ha.

Soils: According to EPA mapping, the majority of the soils at the landbank are BminDW - Grey Brown Podzolics, Brown Earths (medium-high base status) derived from mainly non-calcareous parent materials, with an area of BminSW - Renzinas, Lithosols along the north-western boundary.

Subsoils: The Teagasc subsoils from GSI show that the landbank is underlain TLs, Till derived from limestones, with an area of bedrock outcrop or subcrop along the north-western boundary.

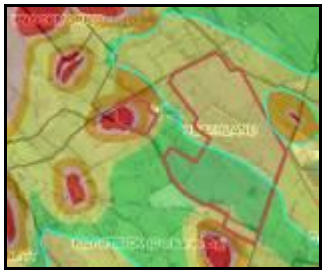
Groundwater Aspects: There are no source protection zones or karst features in the immediate area of the landbank as recorded in the GSI mapping. The nearest source protection zone is the Ballivor Outer Protection Zone c.29km southeast. According to GSI database, the nearest borehole (ID: 2325NWW004) is located c.2km northeast of the landbank.

Aquifer Vulnerability: The aquifer at the majority of the site is classed as LI (Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones) by the GSI, however the section of land along the eastern side of the landbank is classed as Lk (Locally Important Aquifer – Karstified). The vulnerability rating for the majority of the landbank is classed as Low (L) to Moderate (M), with the exception of the separate landbank to the northwest which is classed as High (H) to Extreme (E) with rock outcrops present. The subsoil thickness is likely to be >10m for the majority of the landbank with the exception of the separate landbank to the northwest which is likely to be 0-3m.

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

R1- Acceptable, subject to normal good practice.

R3[1]- Not generally acceptable, unless a consistent minimum thickness of 1m of soil and subsoil can be demonstrated. (For the separate landbank located to the northwest).



2. Charlotte Walsh - Ballynagall (Loughanstown)

Location: The landbank belonging to Charlotte Walsh is situated in the townlands of Ballynagall, Co. Westmeath. It is located c.5.5km north of Mullingar, Co. Westmeath. The landbank consists of 2 No. tillage landbanks with a total useable land area of 9.03ha.

Soils: According to EPA mapping, the majority of the soils at the landbank are AminDW - Acid Brown Earths, Brown Podzolics derived from mainly non-calcareous parent materials

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

Groundwater Aspects: There are no source protection zones or karst features in the immediate area of the landbank as recorded in the GSI mapping. The nearest source protection zone is the Ballivor Outer Protection Zone c.25km southeast. According to GSI database, the nearest borehole (ID: 2325NEW010) is located c.1.7km northeast of the landbank.

Aquifer Vulnerability: The aquifer at the site is classed as Lk (Locally Important Aquifer - Karstified) by the GSI. The vulnerability rating for the landbank is classed as Moderate (M) to High (H) across the landbank, with a small area classed as extreme along the northern boundary. The subsoil thickness is likely to be 3-10m for the majority of the site.

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

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

R3[1]- Not generally acceptable, unless a consistent minimum thickness of 1m of soil and subsoil can be demonstrated. (For the northern tip of the landbank).

1. Clonmore

Location: The landbank is situated in the townland of Clonmore, Co. Westmeath. It is located along the southern boundary of Mullingar, Co. Westmeath. The landbank consists of 1 No. landbank with a total useable land area of 6ha.

Soils: According to EPA mapping, the majority of the soils at the landbank are BminDW - Grey Brown Podzolics, Brown Earths (medium-high base status) derived from mainly non-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 karst features in the immediate area of the landbank as recorded in the GSI mapping. The nearest source protection zone is the Toberdaly Outer Protection Zone c.19km southeast. According to GSI database, the nearest borehole (ID: 2325SWW006) is located c.2.4km southwest of the landbank.

Aquifer Vulnerability: The aquifer at the site is classed as LI (Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones) by the GSI. The vulnerability rating for the landbank is classed as Moderate (M) to High (H) across the landbank. The subsoil thickness is likely to be 3-10m for the majority of the site.

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

R1- Acceptable, subject to normal good practice.

1. GW Agri Contracting Ltd & Charlotte Walshe (Lynn)

Location: The landbank is situated in the townland of Lynn, Co. Westmeath. It is located c.1.3km south of Mullingar, Co. Westmeath. The landbank consists of 3 No. tillage landbanks with a total useable land area of 18.32ha.

Soils: According to EPA mapping, the majority of the soils at the landbank are a mix of BminDW - Grey Brown Podzolics, Brown Earths (medium-high base status) and BminPDPT - Peaty Gleys 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 karst features in the immediate area of the landbank as recorded in the GSI mapping. The nearest source protection zone is the Toberdaly Outer Protection Zone c.18km southeast. According to GSI database, the nearest borehole (ID: 2325SWW006) is located c.2.3km west of the landbank.

Aquifer Vulnerability: The aquifer at the site is classed as LI (Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones) by the GSI. The vulnerability rating for the majority of the landbank is classed as High (H) across the landbank, with the exception of a small area rated as Extreme in the western boundary corner. The subsoil thickness is likely to be 3-5m for the majority of the site.

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

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

R3[1]- Not generally acceptable, unless a consistent minimum thickness of 1m of soil and subsoil can be demonstrated. (For the western corner of the landbank).

1. Charlotte Walsh (Gaybrook Demesne, Gibbonstown & Mahonstown)

Location: The landbank belonging to Charlotte Walshe is situated in the townlands of Gaybrook Demesne, Gibbonstown & Mahonstown, Co. Westmeath. It is located c.3.5km northwest of Rochfortbridge, Co. Westmeath. The landbank consists of 4 No. tillage landbanks with a total useable land area of 9.03ha.

Soils: According to EPA mapping, the majority of 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 GLs show that the landbank is underlain TCh, Till derived from limestones.

Groundwater Aspects: There are no source protection zones or karst features in the immediate area of the landbank as recorded in the GSI mapping. The nearest source protection zone is the Toberdaly Outer Protection Zone c.12.4km southeast. According to GSI database, the nearest boreholes (ID: 2323NEW218 & 2323NEW219) are located along the western side of the landbank.

Aquifer Vulnerability: The aquifer at the site is classed as LI (Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones) by the GSI. The vulnerability rating for the majority of the landbank is classed as High (H) across the landbank. The subsoil thickness is likely to be 3-5m for the majority of the site.

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

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

1. Charlotte Walsh (Corcloon)

Location: The landbank belonging to Charlotte Walshe is situated in the townlands of Corcloon, Co. Westmeath. It is located c.1km west of Milltownpass, Co. Westmeath. The landbank consists of 1 No. tillage landbanks with a total useable land area of 12.38ha.

Soils: According to EPA mapping, the majority of the soils at the landbank are BminDW - Grey Brown Podzolics, Brown Earths (medium-high base status) derived from mainly calcareous parent materials, with an area of Alluvium along the northern boundary.

Subsoils: The Teagasc subsoils from GSI show that the landbank is underlain TLs, Till derived from limestones, with an area of Alluvium along the northern boundary.

Groundwater Aspects: There are no source protection zones or karst features in the immediate area of the landbank as recorded in the GSI mapping. The nearest source protection zone is the Toberdaly Outer Protection Zone c.9.9km southeast. According to GSI database, the nearest borehole (ID: 2323NEW216) is located c.700m east of the landbank.

Aquifer Vulnerability: The aquifer at the site is classed as LI (Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones) by the GSI. The vulnerability rating for the majority of the landbank is classed as High (H) across the landbank. The subsoil thickness is likely to be 3-5m for the majority of the site.

***Groundwater Responses*:** The landbank has a vulnerability rating of High and is underlain by a locally important aquifer. Based on the GSI criteria the response is classed as follows:

R1- Acceptable, subject to normal good practice.

1. Charlotte Walsh (Milltown (Fartullagh By))

Location: The landbank belonging to Charlotte Walshe is situated in the townland of Milltown, Co. Westmeath. It is located c.700m southwest of Milltownpass, Co. Westmeath. The landbank consists of 1 No. tillage landbanks with a total useable land area of 6.68ha.

Soils: According to EPA mapping, the majority of the soils at the landbank are BminDW - Grey Brown Podzolics, Brown Earths (medium-high base status) derived from mainly calcareous parent materials, with an area of BminPDPT - Peaty Gleys derived from mainly calcareous parent materials along the southern boundary.

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 in the immediate area of the landbank as recorded in the GSI mapping. The nearest source protection zone is the Toberdaly Outer Protection Zone c.9.3km southeast. According to GSI database, the nearest borehole (ID: 2323NEW216) is located along the eastern boundary of the landbank.

Aquifer Vulnerability: The aquifer at the site is classed as LI (Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones) by the GSI. The vulnerability rating for the majority of the landbank is classed as High (H) across the landbank. The subsoil thickness is likely to be 3-5m for the majority of the site.

***Groundwater Responses*:** The landbank have a vulnerability rating of High and is underlain by a locally important aquifer. Based on the GSI criteria the response is classed as follows:

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

1. G W Agri Contracting Ltd (Drumman & Milltown (Fartullagh By))

Location: The landbank belonging to G W Agri Contracting Ltd is situated in the townlands of Drumman & Milltown, Co. Westmeath. It is located c.1.3km south of Milltownpass, Co. Westmeath. The landbank consists of 2 No. tillage landbanks with a total useable land area of 9.24ha.

Soils: According to EPA mapping, the majority of the soils at the landbank are a mix of BminDW - Grey Brown Podzolics, Brown Earths (medium-high base status) derived from mainly calcareous parent materials, BminPD - Surface water Gleys, Ground water Gleys derived from mainly calcareous parent materials and BminPDPT - Peaty Gleys 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 karst features in the immediate area of the landbank as recorded in the GSI mapping. The nearest source protection zone is the Toberdaly Outer Protection Zone c.8km southeast. According to GSI database, the nearest borehole (ID: 2323NEW210) is located along the south-eastern area of the landbank.

Aquifer Vulnerability: The aquifer at the site is classed as LI (Locally Important Aquifer - Bedrock which is Moderately Productive only in Local Zones) by the GSI. The vulnerability rating for the majority of the landbank is classed as High (H) across the landbank. The subsoil thickness is likely to be 3-5m for the majority of the site.

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

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

6. Conclusion

This conclusion is based on professional opinion and reflect the statutory requirements S.I. No. 605 of 2017), site inspection and soil and sludges analysis.

In summary the landbanks have been mapped and soil sampled in 2017. Due to the fact that the most recent statutory requirements (S.I. No. 605 of 2017) require soil samples to be completed every 4 years – these results are still valid for use. It has been assumed for the purpose of this NMP that any soils that were not sampled will be deemed 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 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 300m3/MT (based on a max of 6 No. 50MT applications during the open season) shall be applied on the landspreading on landbanks in accordance with S.I. No. 605 of 2017.

Liffey Meats expect to produce an estimated **2,800MT** of WWTP Sludge & Lairage and **2,200MT** of Paunch during 2019. The calculations shown in Appendix A calculate that the current land banks are capable of accepting **8,690MT** of WWTP Sludge & Lairage & **2,168MT** of Paunch in 2019.

A summary of the calculations is provided below while the full NMP calculations are provided in Appendix A.

Total Recovery Capacity (m3)	Estimated Tonnage for 2019	Total Recovery Capacity (MT) Capacity	% Capacity
WWTP Sludge & Lairage	2,800	8,690	**310%**
Paunch	2,200	2,168	**99%**

Appendix A: – Nutrient Management Plan Maps & Calculations

Liffey Meats NMP Summary Table 2019

WWTP Sludge & Lairage Summary

Farmer Ref Code	Townland (s) where organic fertiliser may be spread	Total Area (Ha)	Total Usable Area (Ha)	Total Amount of Organic fertiliser that may be spread (MT):
GWA2	Drumman 11	10.21	9.24	**766**
GWA3	Milltownpass 13	16.65	14.97	**1,161**
GWA4	Lynn 03	8.73	6.10	**650**
CW2	Milltown 01	6.68	6.68	**554**
CW3	Lynn 03	8.47	5.33	**568**
CW4	Gibbonstown 01	9.90	9.72	**1,259**
CW5	Loughanstown DY1	9.03	9.03	**749**
CW6	Heathland 02	3.92	3.75	**2,982**
Total		**73.59**	**64.82**	**8,690**

WWTP Paunch Summary

Farmer Ref Code	Townland (s) where organic fertiliser may be spread	Total Area (Ha)	Total Usable Area (Ha)	Total Amount of Organic fertiliser that may be spread (MT):
GWA1	Heathland	31.40	28.28	**1,830**
CW1	Heathland	6.45	5.79	**338**
Total		**37.85**	**34.07**	**2,168**

Total Recovery Capacity (m3)	Estimated Tonnage for 2019	Total Recovery Capacity (MT) Capacity	% Capacity
WWTP Sludge & Lairage	2,800	8,690	**310%**
Paunch	2,200	2,168	**99%**

Sample	Nitrogen Kg/MT	Phosphorus Kg/MT	% DS
WWTP Sludge/Lairage	0.878	0.422	2.4
Paunch	1.1	0.6	15.0

Farm Reference GWA1

Farmer/Land Owner Name:	**G W Agri Contracting Ltd**
Landbank Townland:	**Heathland**
Farmer Ref Code:	**GWA1**
Material:	**Paunch**

Field ID No.	Total Area (ha)	Total usable area (ha)	Soil P Test (mg P/l)	Date of Test	P Index	Crop	Maximum P required kg P/ha**	Imported organic fertiliser to be applied (m^3/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	Maximum N required kg N/ha*	Imported N/Ha	Load Factor required due to N limitations
1	14.90	13.84	3.25, 3.22, 3.97	17/11/2017	2	Cereal	35	58.3	35.0	807	100	64.17	100%
2	5.08	3.62	3.4	17/11/2017	2	Cereal	35	58.3	35.0	211	100	64.17	100%
4	11.42	10.82	2.64, 2.73	23/11/2017	1	Cereal	45	75.0	45.0	812	135	82.50	100%
Total:	**31.40**	**28.28**								**1,830**			

*Total available N = (as per Table 16 S.I. 605 of 2017)

**Total available P = (as per Table 17 S.I. 605 of 2017)

Total capacity:	**1,830**	**MT**
Total usable area:	**28.3**	**Hectares**

Concentration of P in Paunch	0.600	**Kg P/MT**
Concentration of N in Paunch	1.100	**Kg N/MT**

Farm Reference CW1

Farmer/Land Owner Name:	**Charlotte Walshe**
Landbank Townland:	**Heathland**
Farmer Ref Code:	**CW1**
Material:	**Paunch**

Field ID No.	Total Area (ha)	Total usable area (ha)	Soil P Test (mg P/l)	Date of Test	P Index	Crop	Maximum P required kg P/ha**	Imported organic fertiliser to be applied (m^3/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	Maximum N required kg N/ha*	Imported N/Ha	Load Factor required due to N limitations
3	6.45	5.79	3.1	17/11/2017	2	Cereal	35	58.3	35.0	338	100	64.17	100%
Total:	**6.45**	**5.79**								**338**			

*Total available N = (as per Table 16 S.I. 605 of 2017)

**Total available P = (as per Table 17 S.I. 605 of 2017)

Total capacity:	**338**	**MT**
Total usable area:	**5.8**	**Hectares**

Concentration of P in Paunch	0.600	**Kg P/MT**
Concentration of N in Paunch	1.100	**Kg N/MT**

Farm Reference CW6

Farmer/Land Owner Name:	**Charlotte Walshe**
Landbank Townland:	**Heathland 02**
Farmer Ref Code:	**CW6**
Material:	**WWTP Sludge & Lairage**

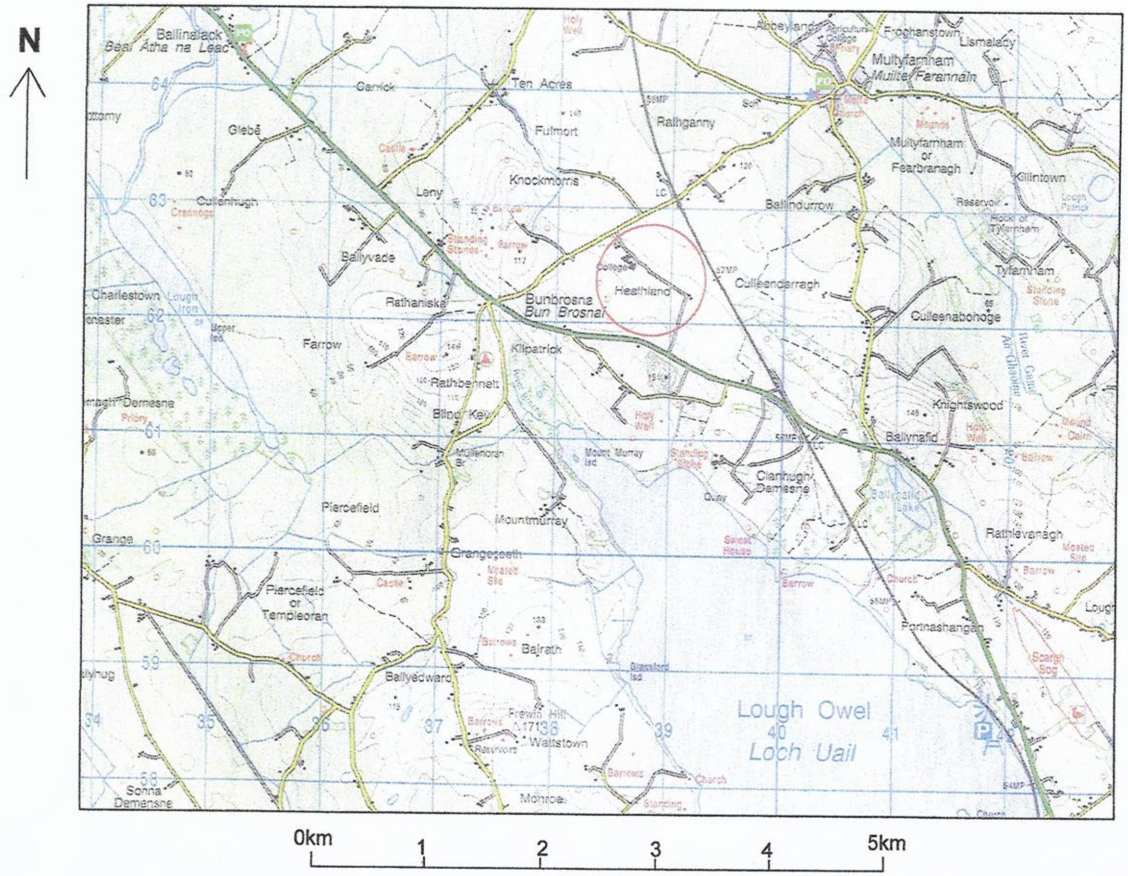
Field ID No.	Total Area (ha)	Total usable area (ha)	Soil P Test (mg P/l)	Date of Test	P Index	Crop	Maximum P required kg P/ha**	Imported organic fertiliser to be applied (m^3/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	Maximum N required kg N/ha*	Imported N/Ha	Load Factor required due to N limitations
6	3.92	3.75	2.01	23/11/2017	1	Cereal	45	106.6	45.0	400	135	93.63	100%
7	17.37	15.53	2.42, 2.56	23/11/2017	1	Cereal	45	106.6	45.0	1656	135	93.63	100%
8	9.11	8.68	1.88, 2.43	23/11/2017	1	Cereal	45	106.6	45.0	926	135	93.63	100%
Total:	**3.92**	**3.75**								**2,982**			

*Total available N = (as per Table 16 S.I. 605 of 2017)

**Total available P = (as per Table 17 S.I. 605 of 2017)

Total capacity:	**2,982**	**MT**
Total usable area:	**3.8**	**Hectares**

Concentration of P in WWTP Sludge & Lairage	0.422	**Kg P/MT**
Concentration of N in WWTP Sludge & Lairage	0.878	**Kg N/MT**



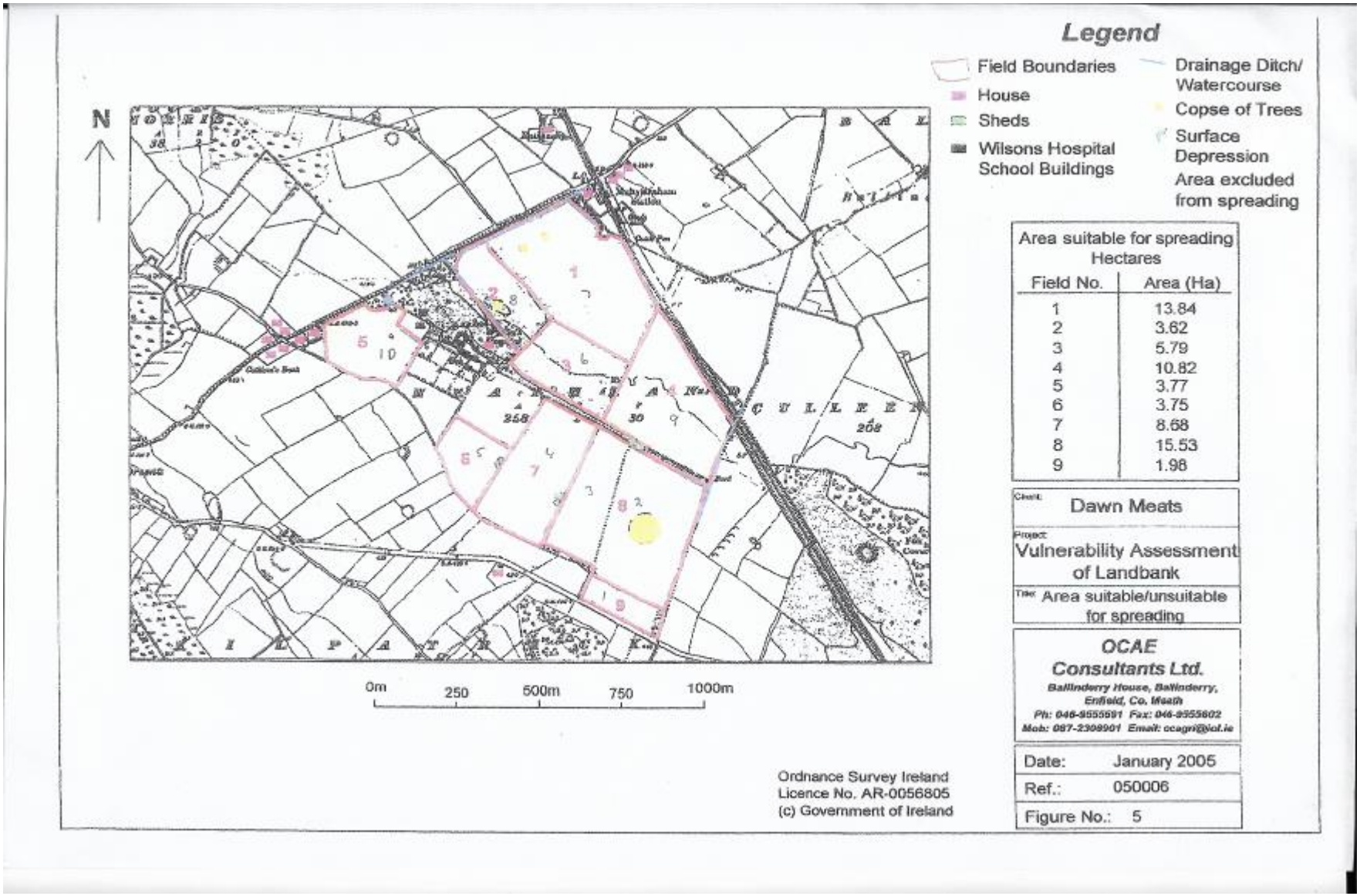
Legend

Approximate Site Location

Client:	Dawn Meats
Project:	Vulnerability Assessment of Landbank
Title:	Location Map

OCAE Consultants Ltd.
Ballinderry House, Ballinderry, Enfield, Co. Meath
Ph: 046-9555591 Fax: 046-9555602
Mob: 087-2306901 Email: ocagri@iol.ie

Date:	January 2005
Ref.:	050006
Figure No.:	1


Legend
Field Boundaries
House
Sheds
Wilsons Hospital School Buildings
Drainage Ditch/ Watercourse
Copse of Trees
Surface Depression
Area excluded from spreading
N
0m 250 500m 750 1000m
Ordnance Survey Ireland
Licence No. AR-0056805
(c) Government of Ireland
Area suitable for spreading Hectares
Field No. | Area (Ha)
1 | 13.84
2 | 3.62
3 | 5.79
4 | 10.82
5 | 3.77
6 | 3.75
7 | 8.68
8 | 15.53
9 | 1.98
Client: Dawn Meats
Project: Vulnerability Assessment of Landbank
Title: Area suitable/unsuitable for spreading
OCAE Consultants Ltd.
Ballinderry House, Ballinderry, Enfield, Co. Meath
Ph: 046-9555691 Fax: 046-9555602
Mob: 087-2308901 Email: ocagri@iol.ie
Date: January 2005
Ref.: 050006
Figure No.: 5

Farm Reference CW5

Farmer/Land Owner Name:	**Charlotte Walshe**
Landbank Townland:	**Loughanstown DY1**
Farmer Ref Code:	**CW5**
Material:	**WWTP Sludge & Lairage**

Field ID No.	Total Area (ha)	Total usable area (ha)	Soil P Test (mg P/l)	Date of Test	P Index	Crop	Maximum P required kg P/ha**	Imported organic fertiliser to be applied (m^3/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	Maximum N required kg N/ha*	Imported N/Ha	Load Factor required due to N limitations
1	9.03	9.03	4.39, 4.61	30/03/2017	2	Cereal	35	82.9	35.0	749	100	72.82	100%
Total:	**9.03**	**9.03**								**749**			

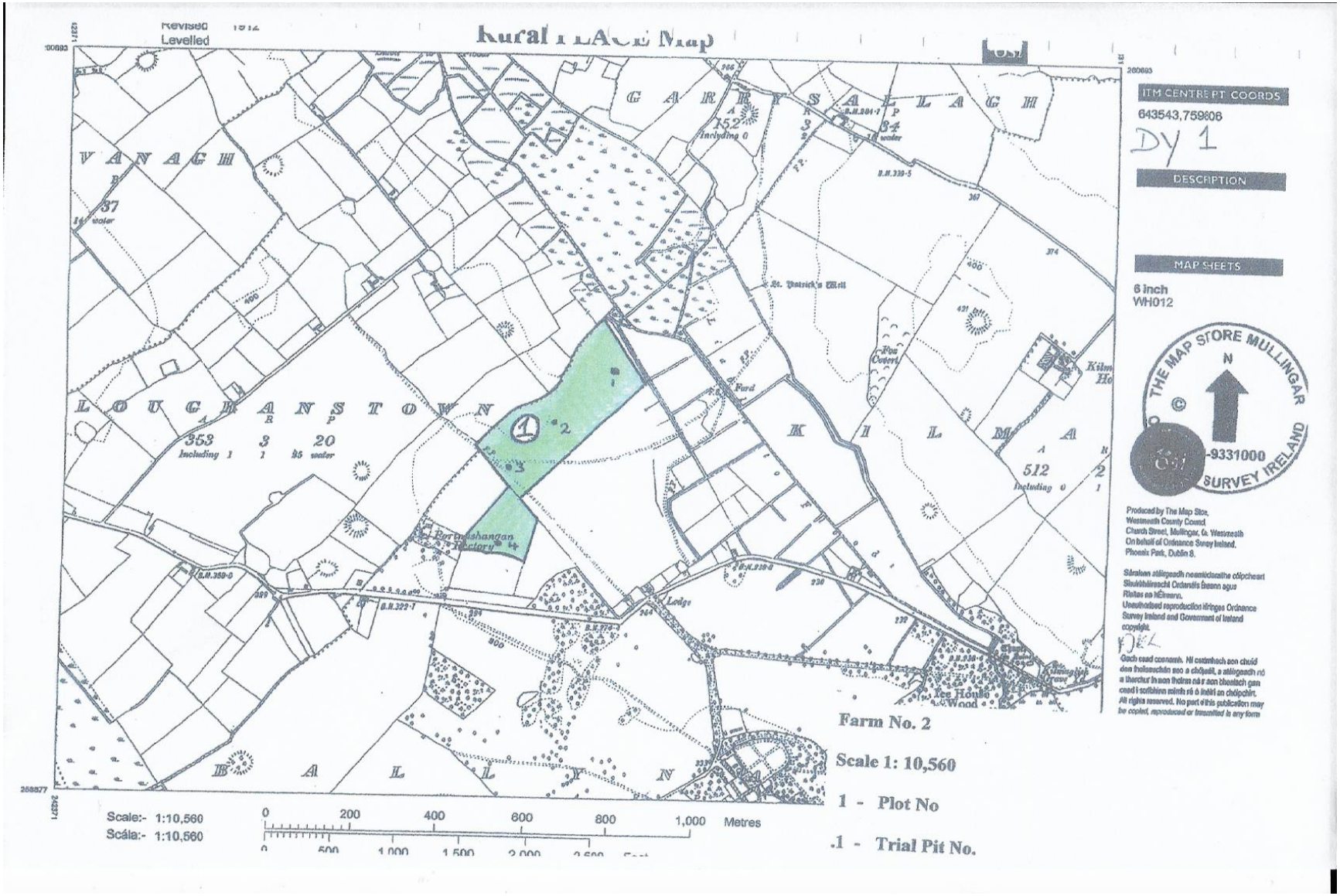
*Total available N = (as per Table 16 S.I. 605 of 2017)

**Total available P = (as per Table 17 S.I. 605 of 2017)

Total capacity:	**749**	**MT**
Total usable area:	**9.0**	**Hectares**

Concentration of P in WWTP Sludge & Lairage	0.422	**Kg P/MT**
Concentration of N in WWTP Sludge & Lairage	0.878	**Kg N/MT**


Bunbrosna
Bun Brosnai
Heathland
Culleendarragh
Culleenabohoge
Larkinstown
Martinstown
Galmoylestown Lower
Galmoylestown Upper
Crookedwood
Tigh Munna
Farrancallin
Knightswood
Ballynafid
Clanhugh Demesne
Down
Mountmurray
Rathlevanagh
Garrysallagh
Parsonstown
Sheefin
Rathcorbs
Monkstown
Taughmon
Kilmaglish
Portnashangan
Monilea
An Muine Liath
Bairath
Lough Owel
Loch Uail
Ballynagall
Moneylea
Knockdrin
Tobberaguill
Wattstown
Larchy Hill
Crazy Corner
Cartron
Brockagh
Knockdrin
Scurlockstown
Portloman
Culleen More
Quarry
Drinmore
Currabrack
Lough Ager
Lugnaguillagh
Loughager Beg
Ballard
Farranistick
Clonsheever
Culleen Beg
Rathconnell
Robinstown
Rathgowan
or
Farranshock
MULLINGAR
Slanestown
Ballyote


Rural Place Map
Revised
Levelled
ITM CENTRE PT COORDS
643543,759806
DY 1
DESCRIPTION
MAP SHEETS
6 inch
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THE MAP STORE MULLINGAR
N
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SURVEY IRELAND
Produced by The Map Store,
Westmeath County Council
Church Street, Mullingar, Co. Westmeath
On behalf of Ordnance Survey Ireland,
Phoenix Park, Dublin 8.
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VANACH
GARRYSALLAGH
LOUGHANSTOWN
KILMA
BALLYN
Farm No. 2
Scale 1: 10,560
1 - Plot No
.1 - Trial Pit No.
Scale:- 1:10,560
Scála:- 1:10,560
0 200 400 600 800 1,000 Metres
0 500 1,000 1,500 2,000

Farm Reference GWA4

Farmer/Land Owner Name:	**G W Agri Contracting Ltd**
Landbank Townland:	**Lynn 03**
Farmer Ref Code:	**GWA4**
Material:	**WWTP Sludge & Lairage**

Field ID No.	Total Area (ha)	Total usable area (ha)	Soil P Test (mg P/l)	Date of Test	P Index	Crop	Maximum P required kg P/ha**	Imported organic fertiliser to be applied (m^3/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	Maximum N required kg N/ha*	Imported N/Ha	Load Factor required due to N limitations
1	8.73	6.10	2.32	30/01/2017	1	Cereal	45	106.6	45.0	650	135	93.63	100%
Total:	**8.73**	**6.10**								**650**			

*Total available N = (as per Table 16 S.I. 605 of 2017)

**Total available P = (as per Table 17 S.I. 605 of 2017)

Total capacity:	**650**	**MT**
Total usable area:	**6.1**	**Hectares**

Concentration of P in WWTP Sludge & Lairage	0.422	**Kg P/MT**
Concentration of N in WWTP Sludge & Lairage	0.878	**Kg N/MT**

Farm Reference CW3

Farmer/Land Owner Name:	**Charlotte Walshe**
Landbank Townland:	**Lynn 03**
Farmer Ref Code:	**CW3**
Material:	**WWTP Sludge & Lairage**

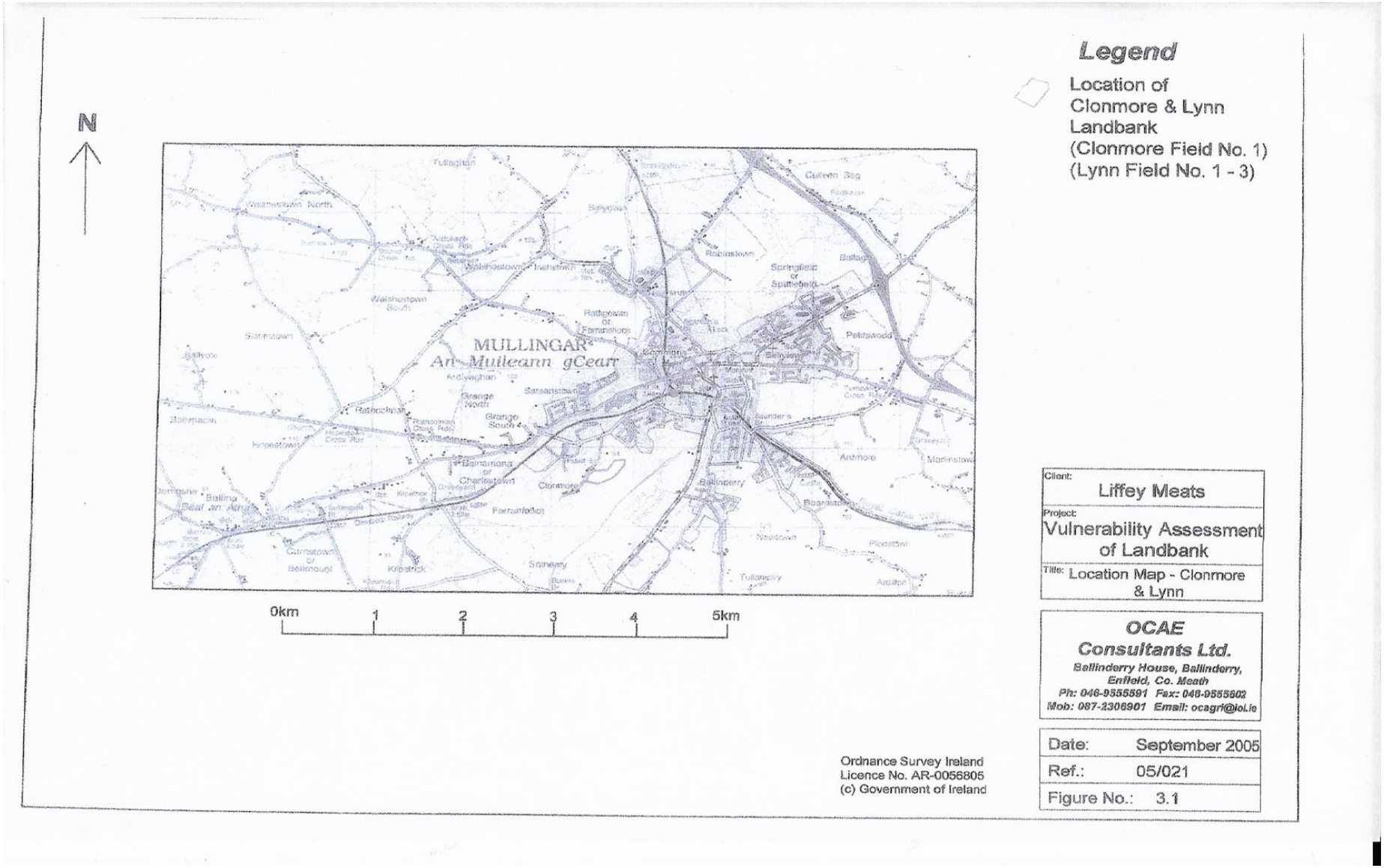
Field ID No.	Total Area (ha)	Total usable area (ha)	Soil P Test (mg P/l)	Date of Test	P Index	Crop	Maximum P required kg P/ha**	Imported organic fertiliser to be applied (m^3/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	Maximum N required kg N/ha*	Imported N/Ha	Load Factor required due to N limitations
2	8.47	5.33	2.02	30/01/2017	1	Cereal	45	106.6	45.0	568	135	93.63	100%
Total:	**8.47**	**5.33**								**568**			

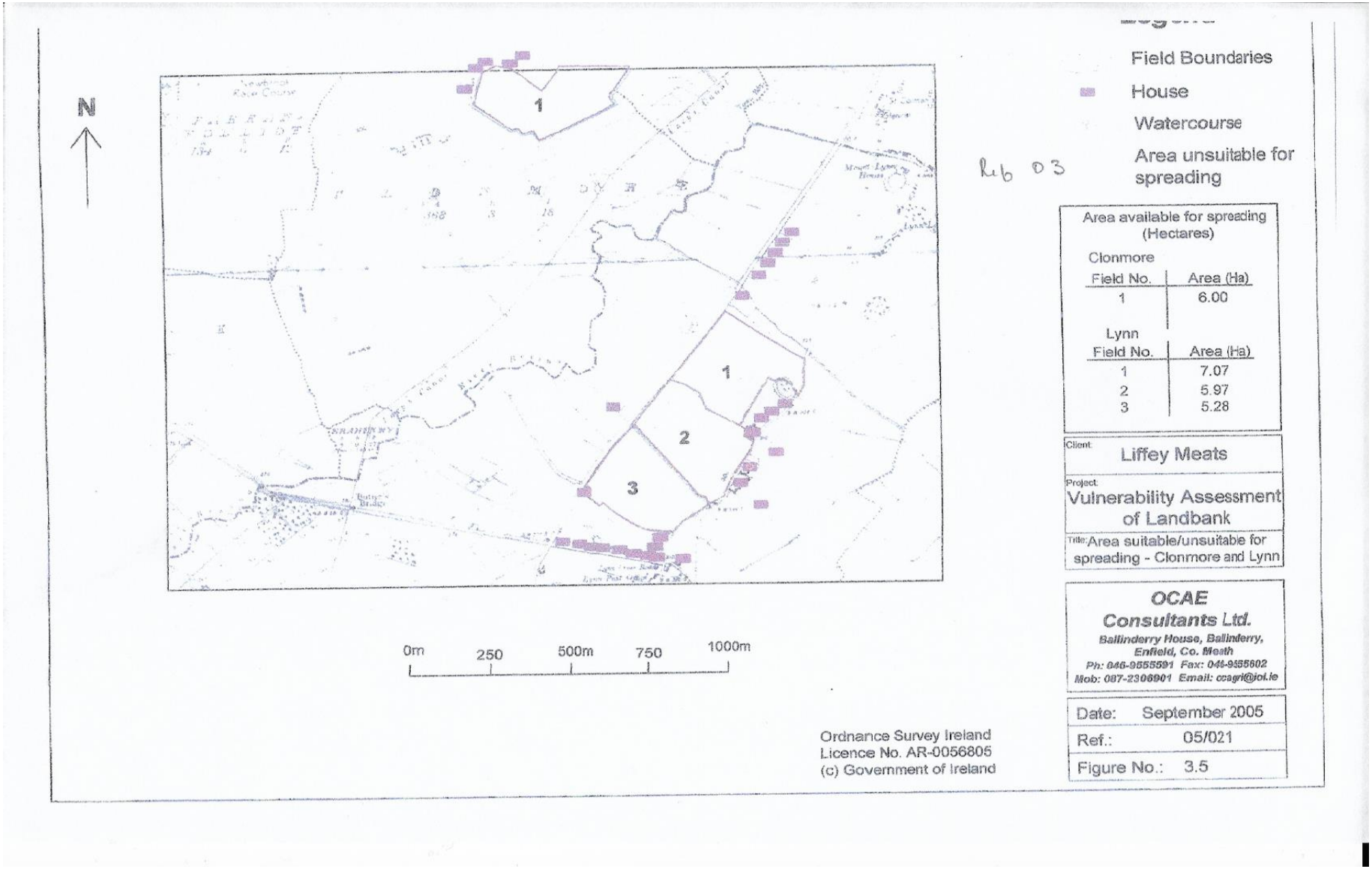
*Total available N = (as per Table 16 S.I. 605 of 2017)

**Total available P = (as per Table 17 S.I. 605 of 2017)

Total capacity:	**568**	**MT**
Total usable area:	**5.3**	**Hectares**

Concentration of P in WWTP Sludge & Lairage	0.422	**Kg P/MT**
Concentration of N in WWTP Sludge & Lairage	0.878	**Kg N/MT**


N
MULLINGAR
An Muileann gCearr
Legend
Location of Clonmore & Lynn Landbank
(Clonmore Field No. 1)
(Lynn Field No. 1 - 3)
0km 1 2 3 4 5km
Ordnance Survey Ireland
Licence No. AR-0056805
(c) Government of Ireland
Client: Liffey Meats
Project: Vulnerability Assessment of Landbank
Title: Location Map - Clonmore & Lynn
OCAE Consultants Ltd.
Ballinderry House, Ballinderry, Enfield, Co. Meath
Ph: 046-9555591 Fax: 046-9555602
Mob: 087-2306901 Email: ocagri@iol.ie
Date: September 2005
Ref.: 05/021
Figure No.: 3.1


N
1
1
2
3
Field Boundaries
House
Watercourse
Area unsuitable for spreading
Rb 03
Area available for spreading (Hectares)
Clonmore
Field No. | Area (Ha)
1 | 6.00
Lynn
Field No. | Area (Ha)
1 | 7.07
2 | 5.97
3 | 5.28
Client: Liffey Meats
Project: Vulnerability Assessment of Landbank
Title: Area suitable/unsuitable for spreading - Clonmore and Lynn
OCAE Consultants Ltd.
Ballinderry House, Ballinderry, Enfield, Co. Meath
Ph: 046-9555591 Fax: 046-9555602
Mob: 087-2306901 Email: ocagri@iol.ie
Date: September 2005
Ref.: 05/021
Figure No.: 3.5
0m 250 500m 750 1000m
Ordnance Survey Ireland
Licence No. AR-0056805
(c) Government of Ireland

Farm Reference CW4

Farmer/Land Owner Name:	**Charlotte Walshe**
Landbank Townland:	**Gibbonstown 01**
Farmer Ref Code:	**CW4**
Material:	**WWTP Sludge & Lairage**

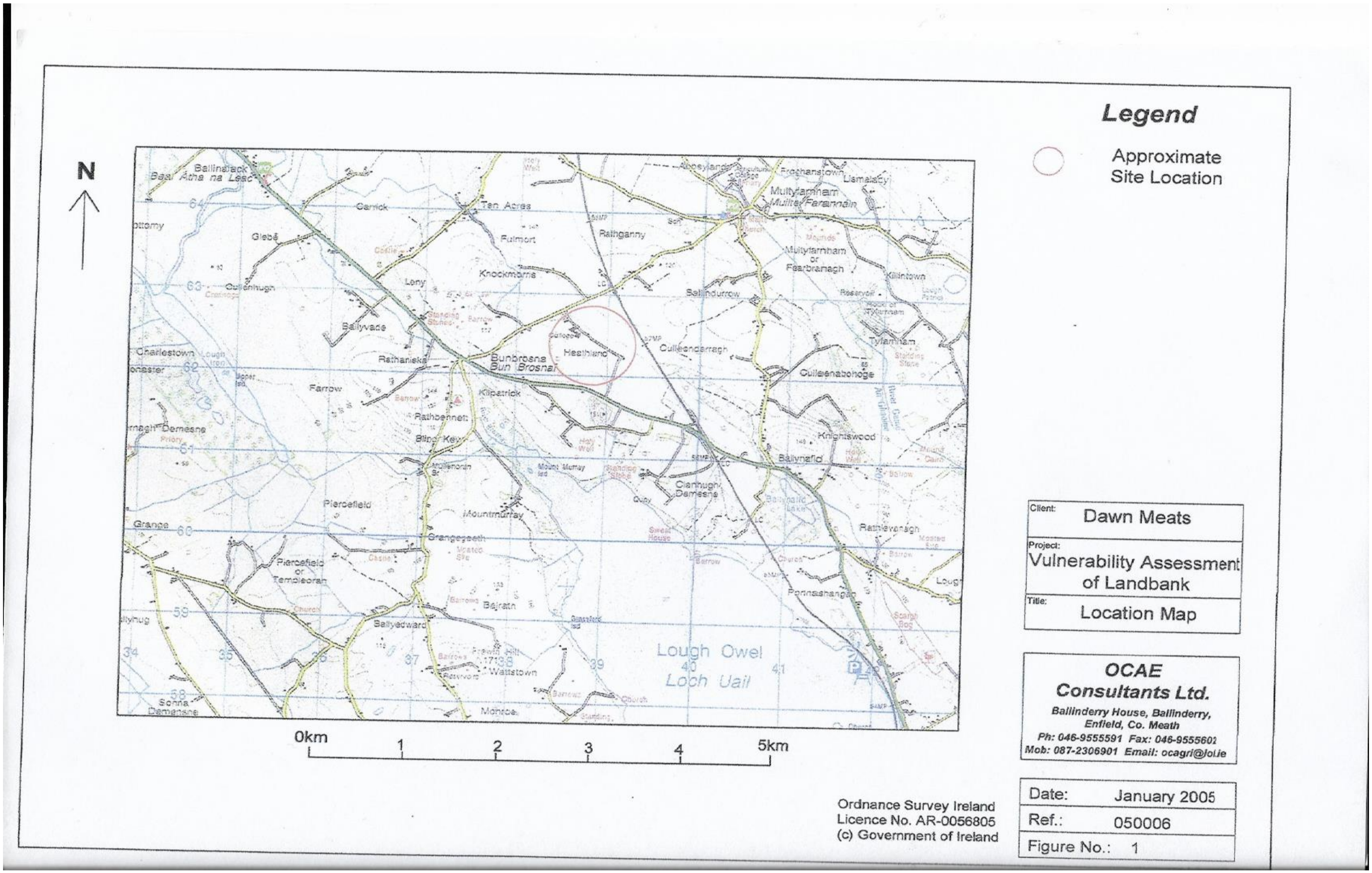
Field ID No.	Total Area (ha)	Total usable area (ha)	Soil P Test (mg P/l)	Date of Test	P Index	Crop	Maximum P required kg P/ha**	Imported organic fertiliser to be applied (m^3/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	Maximum N required kg N/ha*	Imported N/Ha	Load Factor required due to N limitations
1	9.90	9.72	2.50, 2.50	23/11/2017	1	Cereal	45	106.6	45.0	1036	135	93.63	100%
2	2.14	2.09	2.5	23/11/2017	1	Cereal	45	106.6	45.0	223	135	93.63	100%
Total:	**9.90**	**9.72**								**1,259**			

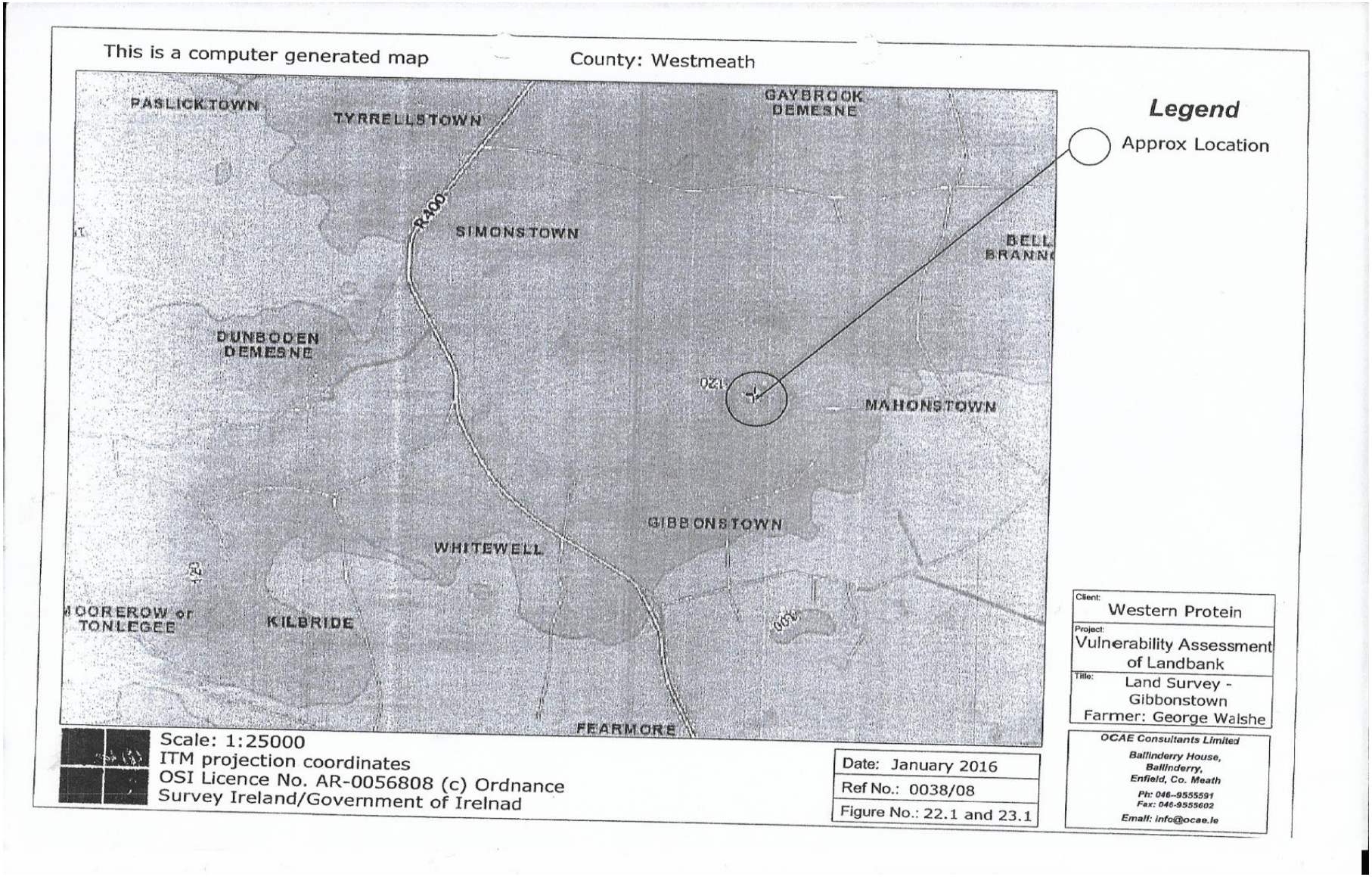
*Total available N = (as per Table 16 S.I. 605 of 2017)

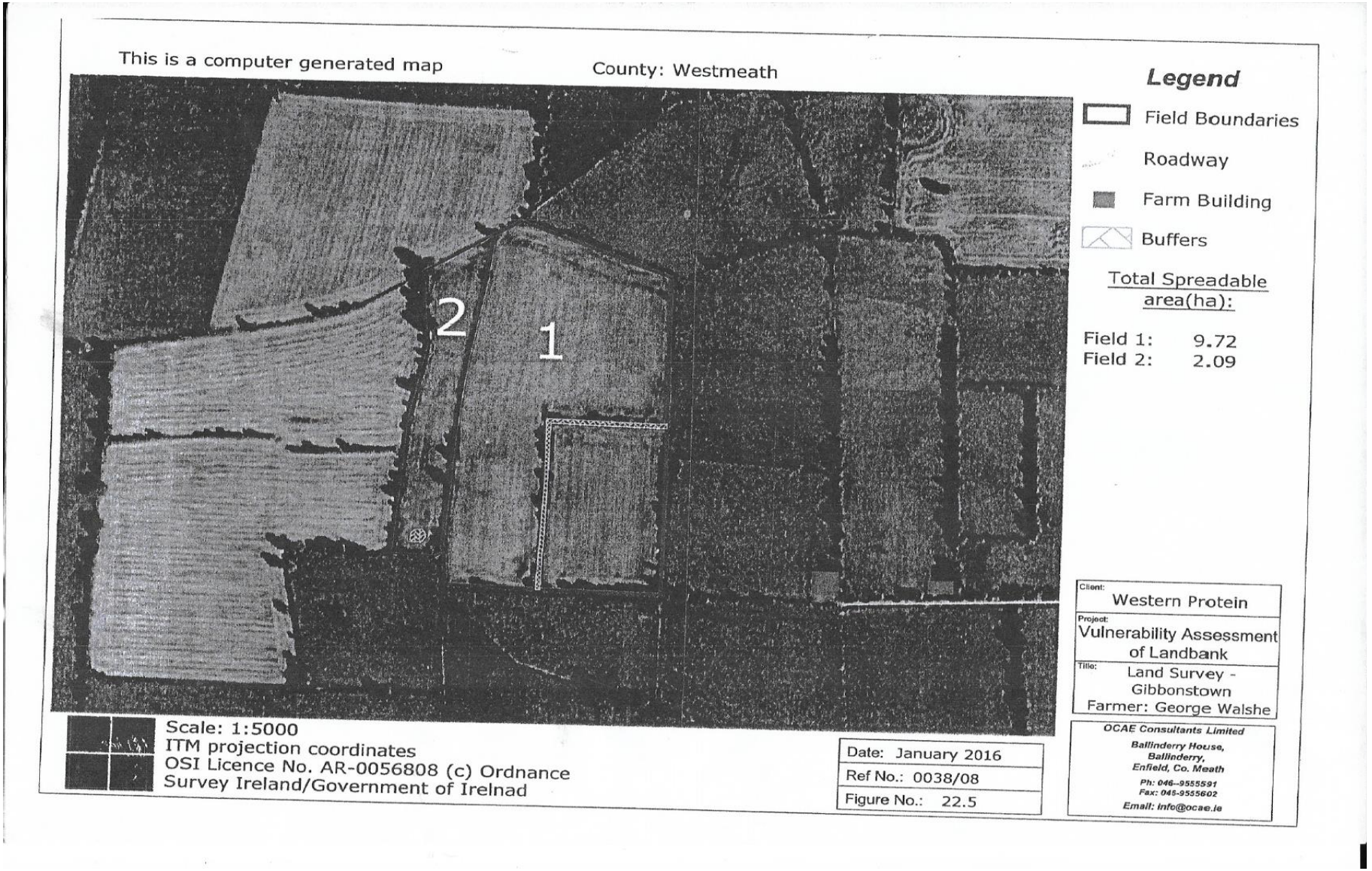
**Total available P = (as per Table 17 S.I. 605 of 2017)

Total capacity:	**1,259**	**MT**
Total usable area:	**9.7**	**Hectares**

Concentration of P in WWTP Sludge & Lairage	0.422	**Kg P/MT**
Concentration of N in WWTP Sludge & Lairage	0.878	**Kg N/MT**


N
Legend
Approximate Site Location
Lough Owel
Loch Uail
0km
1
2
3
4
5km
Ordnance Survey Ireland
Licence No. AR-0056805
(c) Government of Ireland
Client: Dawn Meats
Project: Vulnerability Assessment of Landbank
Title: Location Map
OCAE Consultants Ltd.
Ballinderry House, Ballinderry, Enfield, Co. Meath
Ph: 046-9555591 Fax: 046-9555601
Mob: 087-2306901 Email: ocagri@iol.ie
Date: January 2005
Ref.: 050006
Figure No.: 1


This is a computer generated map
County: Westmeath
PASLICKTOWN
TYRRELLSTOWN
GAYBROOK DEMESNE
R400
SIMONSTOWN
DUNBODEN DEMESNE
MAHONSTOWN
GIBBONSTOWN
WHITEWELL
KILBRIDE
FEARMORE
Legend
Approx Location
Scale: 1:25000
ITM projection coordinates
OSI Licence No. AR-0056808 (c) Ordnance Survey Ireland/Government of Irelnad
Date: January 2016
Ref No.: 0038/08
Figure No.: 22.1 and 23.1
Client: Western Protein
Project: Vulnerability Assessment of Landbank
Title: Land Survey - Gibbonstown Farmer: George Walshe
OCAE Consultants Limited
Ballinderry House, Ballinderry, Enfield, Co. Meath
Ph: 046-9555591
Fax: 046-9555602
Email: info@ocae.ie


This is a computer generated map
County: Westmeath
2
1
Legend
Field Boundaries
Roadway
Farm Building
Buffers
Total Spreadable area(ha):
Field 1: 9.72
Field 2: 2.09
Client: Western Protein
Project: Vulnerability Assessment of Landbank
Title: Land Survey - Gibbonstown Farmer: George Walshe
Scale: 1:5000
ITM projection coordinates
OSI Licence No. AR-0056808 (c) Ordnance Survey Ireland/Government of Irelnad
Date: January 2016
Ref No.: 0038/08
Figure No.: 22.5
OCAE Consultants Limited
Ballinderry House, Ballinderry, Enfield, Co. Meath
Ph: 046-9555591
Fax: 046-9555602
Email: info@ocae.ie

Farm Reference GWA2

Farmer/Land Owner Name:	**G W Agri Contracting Ltd**
Landbank Townland:	**Drumman 11**
Farmer Ref Code:	**GWA2**
Material:	**WWTP Sludge & Lairage**

Field ID No.	Total Area (ha)	Total usable area (ha)	Soil P Test (mg P/l)	Date of Test	P Index	Crop	Maximum P required kg P/ha**	Imported organic fertiliser to be applied (m^3/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	Maximum N required kg N/ha*	Imported N/Ha	Load Factor required due to N limitations
14	5.80	5.17	3.33	17/11/2017	2	Cereal	35	82.9	35.0	429	100	72.82	100%
15	4.41	4.07	3.59	17/11/2017	2	Cereal	35	82.9	35.0	338	100	72.82	100%
Total:	**10.21**	**9.24**								**766**			

*Total available N = (as per Table 16 S.I. 605 of 2017)

**Total available P = (as per Table 17 S.I. 605 of 2017)

Total capacity:	**766**	**MT**
Total usable area:	**9.2**	**Hectares**

Concentration of P in WWTP Sludge & Lairage	0.422	**Kg P/MT**
Concentration of N in WWTP Sludge & Lairage	0.878	**Kg N/MT**

Farm Reference GWA3

Farmer/Land Owner Name:	**G W Agri Contracting Ltd**
Landbank Townland:	**Milltownpass 13**
Farmer Ref Code:	**GWA3**
Material:	**WWTP Sludge & Lairage**

Field ID No.	Total Area (ha)	Total usable area (ha)	Soil P Test (mg P/l)	Date of Test	P Index	Crop	Maximum P required kg P/ha**	Imported organic fertiliser to be applied (m^3/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	Maximum N required kg N/ha*	Imported N/Ha	Load Factor required due to N limitations
1	2.33	2.14	6.06	30/03/2017	3	Cereal	25	59.2	25.0	127	75	52.01	100%
2	12.87	11.56	4.79, 5.65	30/03/2017	2	Cereal	35	82.9	35.0	959	100	72.82	100%
3	1.45	1.27	6.06	30/03/2017	3	Cereal	25	59.2	25.0	75	75	52.01	100%
Total:	**16.65**	**14.97**								**1,161**			

*Total available N = (as per Table 16 S.I. 605 of 2017)

**Total available P = (as per Table 17 S.I. 605 of 2017)

Total capacity:	**1,161**	**MT**
Total usable area:	**15.0**	**Hectares**

Concentration of P in WWTP Sludge & Lairage	0.422	**Kg P/MT**
Concentration of N in WWTP Sludge & Lairage	0.878	**Kg N/MT**

Farm Reference CW2

Farmer/Land Owner Name:	**Charlotte Walshe**
Landbank Townland:	**Milltown 01**
Farmer Ref Code:	**CW2**
Material:	**WWTP Sludge & Lairage**

Field ID No.	Total Area (ha)	Total usable area (ha)	Soil P Test (mg P/l)	Date of Test	P Index	Crop	Maximum P required kg P/ha**	Imported organic fertiliser to be applied (m^3/ha)	Imported P to be applied (kg P/ha)	Total Imported Organic Fertiliser per plot (MT)	Maximum N required kg N/ha*	Imported N/Ha	Load Factor required due to N limitations
2	6.68	6.68	4.16	17/11/2017	2	Cereal	35	82.9	35.0	554	100	72.82	100%
Total:	**6.68**	**6.68**								**554**			

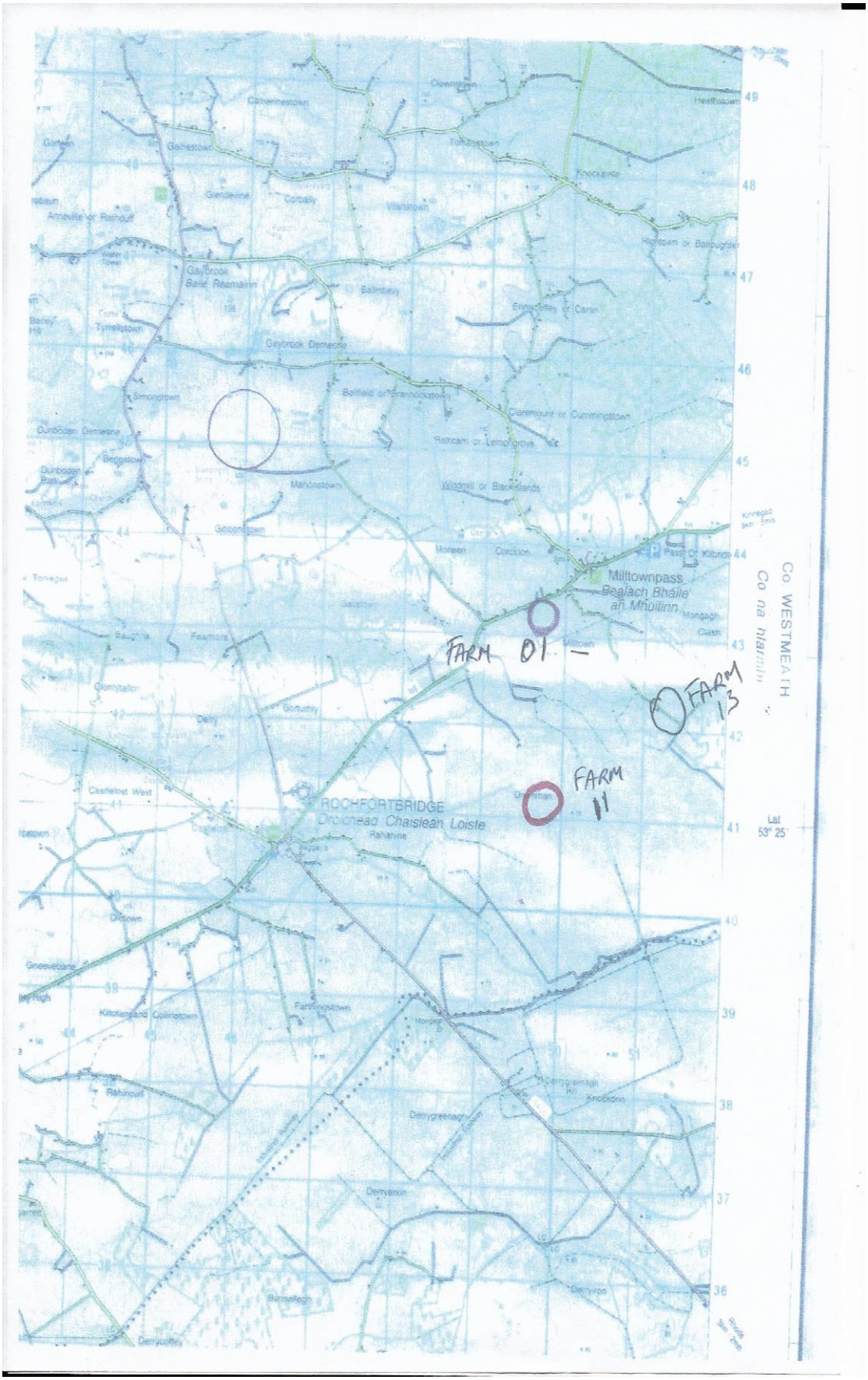
*Total available N = (as per Table 16 S.I. 605 of 2017)

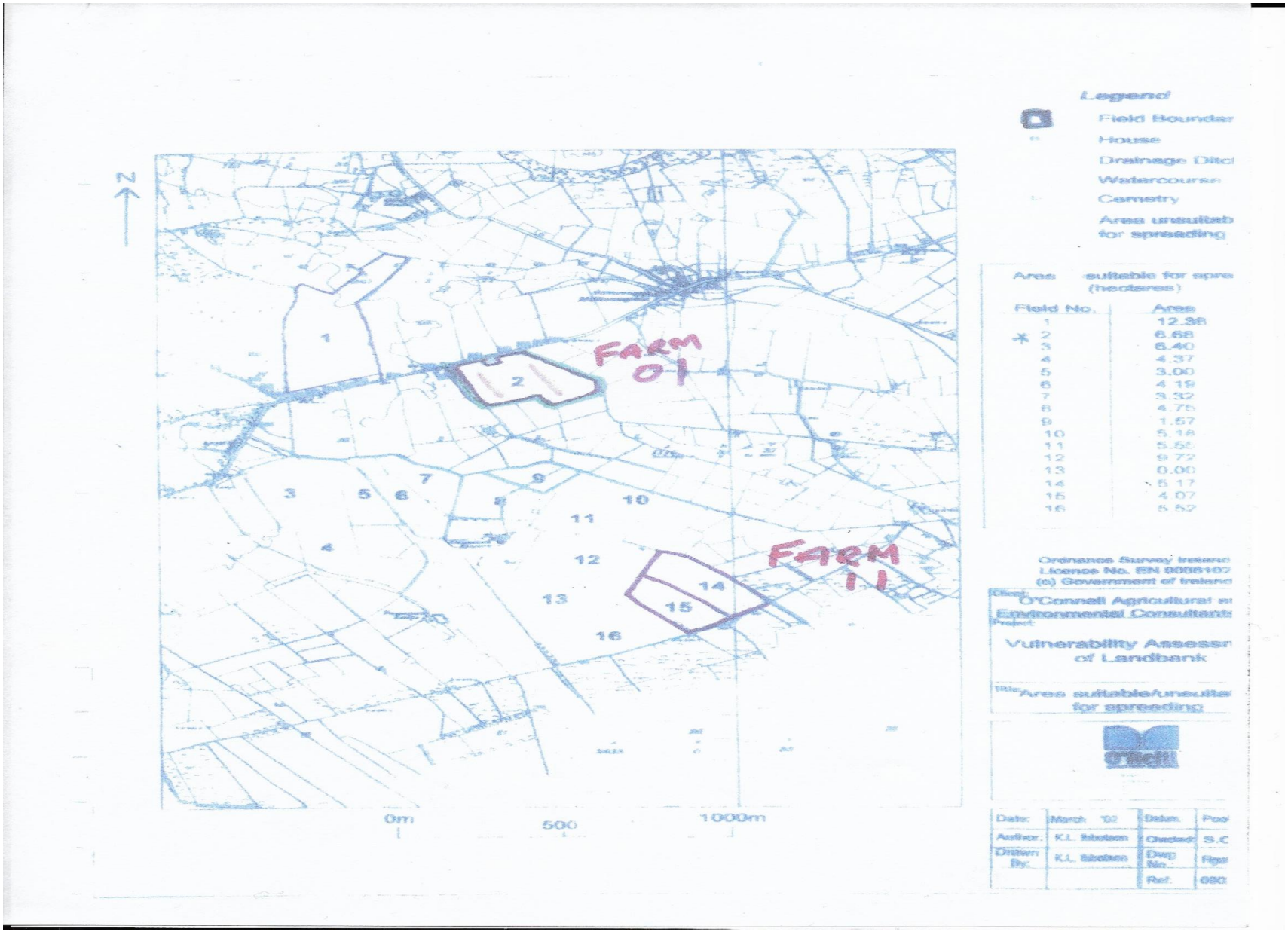
**Total available P = (as per Table 17 S.I. 605 of 2017)

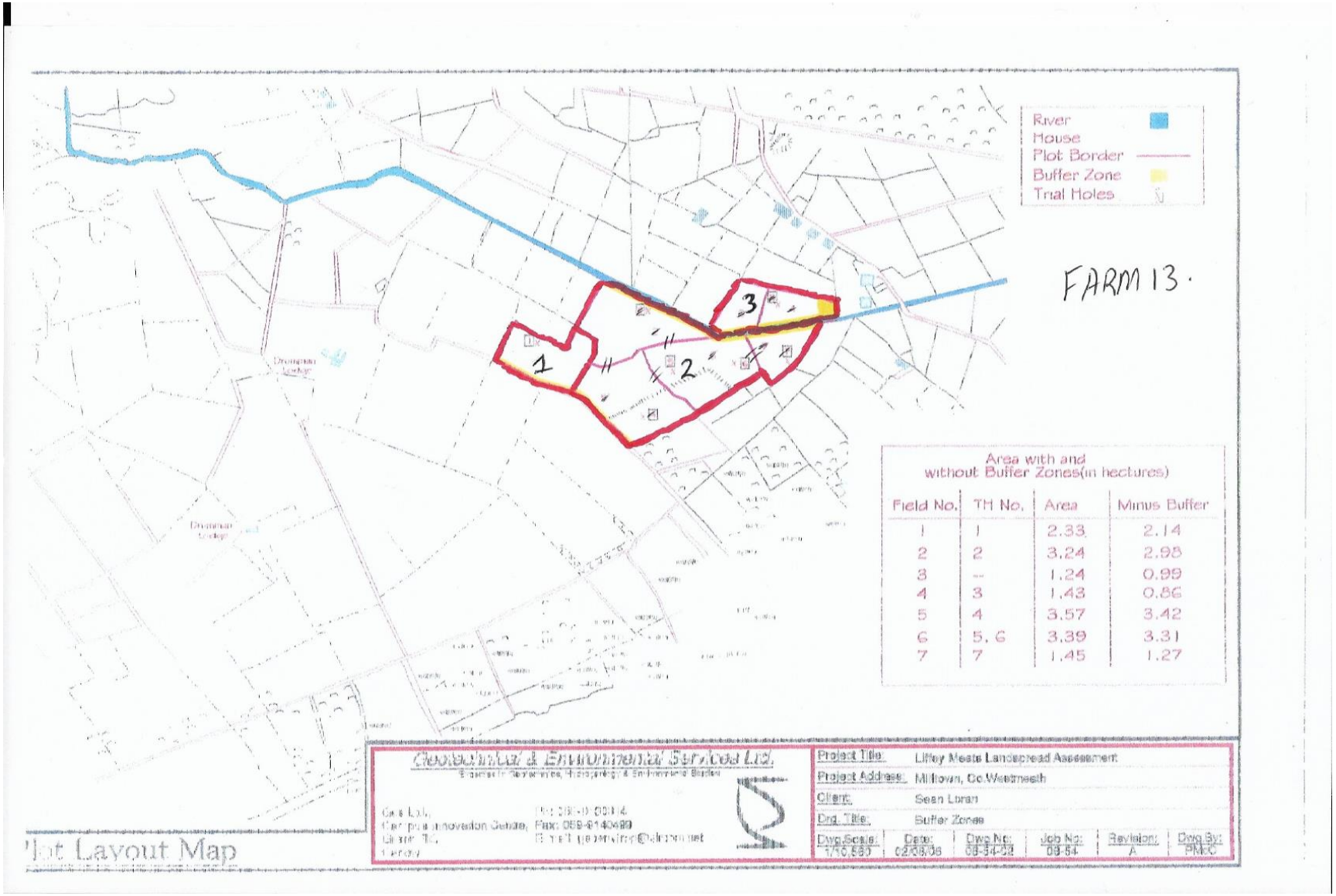
Total capacity:	**554**	**MT**
Total usable area:	**6.7**	**Hectares**

Concentration of P in WWTP Sludge & Lairage	0.422	**Kg P/MT**
Concentration of N in WWTP Sludge & Lairage	0.878	**Kg N/MT**

NMP 2019


Milltownpass
Bealach Bháile
an Mhuilinn
FARM 01
FARM 13
FARM 11
ROCHFORTBRIDGE
Droichead Chaisleán Loiste
Co WESTMEATH
Co na hIarmh
Lat 53° 25'


N
FARM 01
FARM 11
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
0m
500
1000m
Legend
Field Boundar
House
Drainage Ditc
Watercourse
Cemetry
Area unsuitab
for spreading
Area suitable for spre
(hectares)
Field No. Area
1 12.38
2 6.68
3 6.40
4 4.37
5 3.00
6 4.19
7 3.32
8 4.76
9 1.57
10 5.18
11 5.66
12 9.72
13 0.00
14 5.17
15 4.07
16 5.52
Ordnance Survey Ireland
Licence No. EN 0006102
(c) Government of Ireland
O'Connell Agricultural
Environmental Consultants
Vulnerability Assessm
of Landbank
Area suitable/unsuitab
for spreading
Date: March '02
Author: K.L. Madden
Drawn By: K.L. Madden
Checked: S.C
Dwg No.
Ref: 080


River
House
Plot Border
Buffer Zone
Trial Holes
FARM 13.
1
2
3
Area with and without Buffer Zones(in hectares)
Field No. | TH No. | Area | Minus Buffer
1 | 1 | 2.33 | 2.14
2 | 2 | 3.24 | 2.98
3 | -- | 1.24 | 0.99
4 | 3 | 1.43 | 0.86
5 | 4 | 3.57 | 3.42
6 | 5, 6 | 3.39 | 3.31
7 | 7 | 1.45 | 1.27
Project Title: Liffey Meats Landspread Assessment
Project Address: Milltown, Co.Westmeath
Client: Sean Loran
Drg. Title: Buffer Zones
Dwg.Scale: 1/10,560
Date: 02/08/08
Dwg.No: 08-54-02
Job No: 08-54
Revision: A
Dwg.By: PMcC
Plot Layout Map

Appendix B: – Organic Material Analysis

WWTP Sludge Analysis 2019

Oldcastle Laboratories Ltd.
Cogan St., Oldcastle, Co. Meath, Ireland.
Tel: (049) 8541160 , Fax: (049) 8541755
Email: info@oldcastlelabs.ie Website: www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No: 273721
Date Received: Thursday 21 February 2019
Customer Name: Liffey Meats Ltd
Address: Oldcastle Road, Ballyjamesduff, Co. Cavan
Reporting Method: Email **Email Address:** john.ogrady@liffeymeats.ie
Sample Reference: EP Sludge Sample
Type of Sample: EP Sludge
Condition of Sample: Satisfactory
Commencement Date: 21st February 2019
Certificate Date: 28th February 2019

Test	Units	Result	Method
Moisture	%	98.11	TM2024
Dry Matter	%	1.89	TM2024
Ash	%	0.37	TM2026
Phosphorus	%	0.04	TM2036
Potassium	%	0.05	TM2042
Nitrogen	%	0.09	TM2023

Unless otherwise stated results are expressed on an "as received" basis.

** = Subcontracted Test*

Signed : Martin Fulton
Analyst

The Above results relate only to the sample submitted and do not guarantee the bulk of the material to be of equal quality. This Certificate of analysis shall not be reproduced except in full without the approval of the laboratory. Oldcastle Laboratories Ltd. was not responsible for sampling and cannot be held liable in respect of the use to which information is put.

Lairage Analysis 2019

Oldcastle Laboratories Ltd.

Cogan St., Oldcastle, Co. Meath, Ireland.
Tel: (049) 8541160 , Fax: (049) 8541755
Email: info@oldcastlelabs.ie Website: www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No: 273725
Date Received: Thursday 21 February 2019
Customer Name: Liffey Meats Ltd
Address: Oldcastle Road, Ballyjamesduff, Co. Cavan
Reporting Method: Email **Email Address:** john.ogrady@liffeymeats.ie
Sample Reference: Lairage Sample
Type of Sample: Lairage
Condition of Sample: Satisfactory
Commencement Date: 21st February 2019
Certificate Date: 28th February 2019

Test	Units	Result	Method
Moisture	%	93.53	TM2024
Dry Matter	%	6.47	TM2024
Ash	%	1.17	TM2026
Phosphorus	%	0.06	TM2036
Potassium	%	0.07	TM2042
Nitrogen	%	0.07	TM2023

Unless otherwise stated results are expressed on an "as received" basis.

** = Subcontracted Test*

Signed : Martin Fulton
Analyst

The Above results relate only to the sample submitted and do not guarantee the bulk of the material to be of equal quality. This Certificate of analysis shall not be reproduced except in full without the approval of the laboratory. Oldcastle Laboratories Ltd. was not responsible for sampling and cannot be held liable in respect of the use to which information is put.

Form 4066 Certificate of Analysis *Page 1 of 1*

Paunch Analysis 2019

Oldcastle Laboratories Ltd.

Cogan St., Oldcastle, Co. Meath, Ireland.
Tel: (049) 8541160 , Fax: (049) 8541755
Email: info@oldcastlelabs.ie Website: www.oldcastlelabs.ie

CERTIFICATE OF ANALYSIS

Lab Ref No: 273722
Date Received: Thursday 21 February 2019
Customer Name: Liffey Meats Ltd
Address: Oldcastle Road, Ballyjamesduff, Co. Cavan
Reporting Method: Email **Email Address:** john.ogrady@liffeymeats.ie
Sample Reference: Bellygrass Sample
Type of Sample: Bellygrass
Condition of Sample: Satisfactory
Commencement Date: 21st February 2019
Certificate Date: 28th February 2019

Test	Units	Result	Method
Moisture	%	84.97	TM2024
Dry Matter	%	15.03	TM2024
Ash	%	1.08	TM2026
Phosphorus	%	0.06	TM2036
Potassium	%	0.08	TM2042
Nitrogen	%	0.11	TM2023

Unless otherwise stated results are expressed on an "as received" basis.

** = Subcontracted Test*

Signed : Martin Fulton
Analyst

The Above results relate only to the sample submitted and do not guarantee the bulk of the material to be of equal quality. This Certificate of analysis shall not be reproduced except in full without the approval of the laboratory. Oldcastle Laboratories Ltd. was not responsible for sampling and cannot be held liable in respect of the use to which information is put.

Form 4066 Certificate of Analysis *Page 1 of 1*

Appendix C: – Soil Analysis

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2188J19**	**Analysis Number:**	**S3A/148768**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	OCAE Personell
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20649/29
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/03/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/03/2017
Sample Description:	GW 25 MILLTOWNPASS 2B	**Date Certificate Issued:**	30/03/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	4.79	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	12.6	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.1	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	None
P Index Grassland:	2
P Index Other Crops:	2

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 30/03/2017

Wendy McCall - Laboratory Manager

*** = not INAB Accredited ^ = Subcontracted**

IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,
Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

4075 Issue 3

Page 1 of 1

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2188J20**	**Analysis Number:**	**S3A/148769**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	OCAE Personell
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20849/29
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/03/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/03/2017
Sample Description:	GW 26 MILLTOWNPASS 2A	**Date Certificate Issued:**	30/03/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	5.65	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	10.7	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.1	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	None
P Index Grassland:	3
P Index Other Crops:	2

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 30/03/2017

Wendy McCall - Laboratory Manager

* = not INAB Accredited ^ = Subcontracted

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Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2188J18**	**Analysis Number:**	**S3A/148767**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	OCAE Personell
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20849/29
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/03/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/03/2017
Sample Description:	GW 24 MULTIPASS 3.+1.	**Date Certificate Issued:**	30/03/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	6.06	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	7.4	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.1	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	None
P Index Grassland:	3
P Index Other Crops:	3

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 30/03/2017

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**7722J15**	**Analysis Number:**	**S3A/157836**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	33522/16
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	16/11/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	16/11/2017
Sample Description:	CW2 GT BOHSTOWN 1A + 2.	**Date Certificate Issued:**	23/11/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	2.50	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	5.7	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.0	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	1
P Index Other Crops:	1

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 23/11/2017

Wendy McCall - Laboratory Manager

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4075 Issue 3 **Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie**

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**7722J14**	**Analysis Number:**	**S3A/157835**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	33522/16
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	16/11/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	16/11/2017
Sample Description:	CW3 GIBBONSTOWN 1B.	**Date Certificate Issued:**	23/11/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	2.50	mg/l	3	5	8	30
Potassium (K) Morgan's^	AA SOP 2009	5.8	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.0	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	1
P Index Other Crops:	1

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 23/11/2017

Wendy McCall - Laboratory Manager

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Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**8975l40**	**Analysis Number:**	**S3A/139064**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20845/45
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/01/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/01/2017
Sample Description:	WT 2 LYNN 2.	**Date Certificate Issued:**	30/01/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	2.02	mg/l	3	5	9	30
Potassium (K) Morgan's	AA SOP 2009	46.3	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	7.1	pH units				
pH (SMP)	Electrometry SOP 2002	7.2	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	1
P Index Other Crops:	1

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 30/01/2017

Wendy McCall - Laboratory Manager

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**8975I43**	**Analysis Number:**	**S3A/139067**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20845/45
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/01/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/01/2017
Sample Description:	WT 1 LYNN 1	**Date Certificate Issued:**	30/01/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	2.32	mg/l	3	5	8	30
Potassium (K) Morgan's	AA SOP 2009	59.8	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	7.6	pH units				
pH (SMP)	Electrometry SOP 2002	7.2	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	None
P Index Grassland:	1
P Index Other Crops:	1

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WO McCall Date: 30/01/2017

Wendy McCall - Laboratory Manager

* = not INAB Accredited ^ = Subcontracted

IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,
Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**7594J06**	**Analysis Number:**	**S3A/157532**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Courier
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	33517/15
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	10/11/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	10/11/2017
Sample Description:	LA 6 MILLTOWN 2.	**Date Certificate Issued:**	17/11/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	4.16	mg/l	3	5	8	30
Potassium (K) Morgan's	AA SOP 2009	36.9	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	7.3	pH units				
pH (SMP)	Electrometry SOP 2002	7.0	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha): **None**

P Index Grassland: **2**

P Index Other Crops: **2**

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 17/11/2017

Wendy McCall - Laboratory Manager

*** = not INAB Accredited** **^ = Subcontracted**

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Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**7594J02**	**Analysis Number:**	**S3A/157528**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Courier
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	33517/15
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	10/11/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	10/11/2017
Sample Description:	LA 2 Drumman 14	**Date Certificate Issued:**	17/11/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	3.33	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	10.2	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	7.8	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	**2**
P Index Other Crops:	**2**

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 17/11/2017

Wendy McCall - Laboratory Manager

*** = not INAB Accredited ^ = Subcontracted**

IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,
Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**7594J03**	**Analysis Number:**	**S3A/157529**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Courier
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	33517/15
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	10/11/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	10/11/2017
Sample Description:	LA 3 DRUMMAN IS	**Date Certificate Issued:**	17/11/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	3.59	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	8.9	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	7.8	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha): None

P Index Grassland: 2

P Index Other Crops: 2

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 17/11/2017

Wendy McCall - Laboratory Manager

*** = not INAB Accredited** **^ = Subcontracted**

IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,

Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**8975I32**	**Analysis Number:**	**S3A/139056**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20845/45
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/01/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/01/2017
Sample Description:	TY 1 ENNISCOFFEY 3+4A	**Date Certificate Issued:**	30/01/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	3.24	mg/l	3	5	8	30
Potassium (K) Morgan's	AA SOP 2009	130.2	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	7.3	pH units				
pH (SMP)	Electrometry SOP 2002	7.0	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha): None

P Index Grassland: 2

P Index Other Crops: 2

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: W McCall Date: 30/01/2017

Wendy McCall - Laboratory Manager

*** = not INAB Accredited ^ = Subcontracted**

IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,

Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**8975I33**	**Analysis Number:**	**S3A/139057**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20845/45
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/01/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/01/2017
Sample Description:	TY 2 ENNISCOFFEY 4B	**Date Certificate Issued:**	30/01/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	3.79	mg/l	3	5	8	30
Potassium (K) Morgan's	AA SOP 2009	132.2	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	7.5	pH units				
pH (SMP)	Electrometry SOP 2002	7.1	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	**2**
P Index Other Crops:	**2**

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 30/01/2017

Wendy McCall - Laboratory Manager

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Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2188J13**	**Analysis Number:**	**S3A/148762**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	OCAE Personell
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20849/29
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/03/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/03/2017
Sample Description:	GW 19 LOUGHANSTOWN 1A.	**Date Certificate Issued:**	30/03/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	4.61	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	15.0	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	6.1	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha): None

P Index Grassland: 2

P Index Other Crops: 2

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 30/03/2017

Wendy McCall - Laboratory Manager

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IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,

4075 Issue 3 **Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie**

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2188J12**	**Analysis Number:**	**S3A/148761**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	OCAE Personell
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20849/29
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/03/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/03/2017
Sample Description:	GW 18 LOUGHANSTOWN 13.	**Date Certificate Issued:**	30/03/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	4.39	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	15.9	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.1	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha): None

P Index Grassland: 2

P Index Other Crops: 2

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 30/03/2017

Wendy McCall - Laboratory Manager

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IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,

Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**7717J03**	**Analysis Number:**	**S3A/157804**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	33520/15
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	16/11/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	16/11/2017
Sample Description:	CT3A HEATHLAND 6	**Date Certificate Issued:**	23/11/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	2.01	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	7.1	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.0	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	None
P Index Grassland:	1
P Index Other Crops:	1

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 23/11/2017

Wendy McCall - Laboratory Manager

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IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,
Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**7717J07**	**Analysis Number:**	**S3A/157808**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	33520/15
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	16/11/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	16/11/2017
Sample Description:	CT1A HEATHLAND 7A.	**Date Certificate Issued:**	23/11/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	2.42	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	3.3	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.0	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	None
P Index Grassland:	1
P Index Other Crops:	1

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 23/11/2017

Wendy McCall - Laboratory Manager

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IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,
Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.laslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**7717J06**	**Analysis Number:**	**S3A/157807**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	33520/15
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	16/11/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	16/11/2017
Sample Description:	CT1B HEATHLAND 7B	**Date Certificate Issued:**	23/11/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	2.56	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	10.4	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.0	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	1
P Index Other Crops:	1

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 23/11/2017

Wendy McCall - Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.275T

IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,
Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**7717J05**	**Analysis Number:**	**S3A/157806**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	33520/15
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	16/11/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	16/11/2017
Sample Description:	CT2A HEATHLAND 8A.	**Date Certificate Issued:**	23/11/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	1.88	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	6.7	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	7.9	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	1
P Index Other Crops:	1

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 23/11/2017

Wendy McCall - Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.275T

IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,
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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**7717J04**	**Analysis Number:**	**S3A/157805**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	Customer
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	33520/15
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	16/11/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	16/11/2017
Sample Description:	CT2B HEATHLAND 8B	**Date Certificate Issued:**	23/11/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	2.43	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	7.1	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	7.8	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	1
P Index Other Crops:	1

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 23/11/2017

Wendy McCall - Laboratory Manager

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IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,

Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2188J24**	**Analysis Number:**	**S3A/148773**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	OCAE Personell
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20849/29
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/03/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/03/2017
Sample Description:	GW 30 ENNISCOFFEY 5.	**Date Certificate Issued:**	30/03/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	4.65	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	6.3	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.1	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	**2**
P Index Other Crops:	**2**

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WO McCall Date: 30/03/2017

Wendy McCall - Laboratory Manager

*** = not INAB Accredited ^ = Subcontracted**

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.2751

IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,

Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2188J25**	**Analysis Number:**	**S3A/148774**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	OCAE Personell
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20849/29
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/03/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/03/2017
Sample Description:	GW 31 ENNISCOFFEY 6A	**Date Certificate Issued:**	30/03/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	4.56	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	7.2	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.1	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	**2**
P Index Other Crops:	**2**

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 30/03/2017

Wendy McCall - Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.2751

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2188J27**	**Analysis Number:**	**S3A/148776**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	OCAE Personell
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20849/29
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/03/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/03/2017
Sample Description:	GW 33 ENNISCOFFEY 6B.	**Date Certificate Issued:**	30/03/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	4.50	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	11.0	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.1	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	**2**
P Index Other Crops:	**2**

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 30/03/2017

Wendy McCall - Laboratory Manager

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ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.275T

IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,
Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2188J28**	**Analysis Number:**	**S3A/148777**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	OCAE Personell
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20849/29
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/03/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/03/2017
Sample Description:	GW 34 ENNISCOFFEY 6C	**Date Certificate Issued:**	30/03/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	3.67	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	10.4	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.1	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha):	**None**
P Index Grassland:	**2**
P Index Other Crops:	**2**

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: W McCall Date: 30/03/2017

Wendy McCall - Laboratory Manager

*** = not INAB Accredited ^ = Subcontracted**

ISO 17025 INAB ACCREDITED TESTING DETAILED IN SCOPE REG NO.275T

IAS LABORATORIES, Unit 4 Bagenalstown Bus. Park, Bagenalstown, Co. Carlow,
Phone: 00353 59 9721022 Fax: 00353 59 9721897 Email: ias@iaslabs.ie Web: www.iaslabs.ie

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IAS LABORATORIES

Independent Analytical Supplies

Test Report

Lab Report Number:	**2188J29**	**Analysis Number:**	**S3A/148778**

Customer ID:	ANNE.A1	**Analysis Type:**	Soil Scan for Reps (S3A)
Contact Name:	MICHAEL WARD	**Delivery By:**	OCAE Personell
Company Name:	ANNEVILLE AGRICULTURAL SERVICES	**Sample Card Number:**	20849/29
Address:	ANNEVILLE GAYBROOK MULLINGAR CO. WESTMEATH	**Sample Condition:**	Acceptable
Sample Type:	Soil	**Date Sample Received:**	09/03/2017
Sample Reference:	SOIL SAMPLES	**Date Analysis Commenced:**	09/03/2017
Sample Description:	GW 35 ENNISCOFFEY 6D	**Date Certificate Issued:**	30/03/2017

Parameter	Method	Result	Unit	Very Low Index 1	Low Index 2	Normal Index 3	High Index 4
Phosphorus (P) Morgan's	Konelab Aquakem SOP 2040	3.96	mg/l	3	5	8	30
Potassium (K) Morgan's*	AA SOP 2009	11.0	mg/l	50	100	150	200
pH (Water)	Electrometry SOP 2001	8.0	pH units				
pH (SMP)	Electrometry SOP 2002	7.3	pH units				

Lime & Fertilizer Requirements:

Lime Requirement for Grass (Tonnes/ha): None

P Index Grassland: 2

P Index Other Crops: 2

The Phosphorous Index System in accordance to S.I. No. 610 of 2010, European Communities (Good Agricultural Practice for Protection of Water) Regulations 2010, i.e. the Nitrates Directive.

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

Please note that the information provided in relation to the phosphorous index and the lime and fertiliser requirements is for reference only and is outside of the laboratory's scope of accreditation.

Signed: WD McCall Date: 30/03/2017

Wendy McCall - Laboratory Manager

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Appendix D: – NMP Sign Off

EPA Regional Inspectorate Dublin
McCumiskey House
Richview,
Clonskeagh Road,
Dublin 14
09 May 2019

To whom it may concern,

I have reviewed Fertiliser Plans (Nutrient Management Plans) in the Liffey Meats Backup NMP 2019 for farm lands owned by the following:

- G W Agri Contracting Ltd – GWA1 – GWA4
- Charlotte Walshe – CW1 – CW6

These fertiliser plans comply with the requirements of the European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2017 (S.I. No. 605 of 2017).

In my professional opinion, organic fertiliser may be used to fertilise any of those farmlands and the application of organic fertiliser from the licensable site to any of those lands in a quantity identified in the Fertiliser Plan and manner that complies with the requirements of the Code of Practice and Buffer Zones of IED licence Reg. No. P0167-02 and European Communities (Good Agricultural Practice for Protection of Waters) Regulations, 2017 (S.I. No. 605 of 2017), will not cause, and is not likely to cause, significant environmental pollution.

Yours sincerely,

Ian Douglas

Ian Douglas
BSc Environmental Science (DIT)
MSc Sustainable Energy and Green Technology (UCD)
Level 5 Certificate in Agriculture (Teagasc)
Level 6 Specific Purpose Certificate in Farming (Teagasc)

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Registered No 282592.
Registered Office: Unit 1 Scurlockstown Business Park, Trim, Co. Meath.
Director: Tom Rowan.
Tel: +353 46 9030102 Mob: +353 86 8327792 Email: info@rec.ie