Agricultural Benefit Statement

For the application of beneficial wastes to fields at:

Cefn Naw Clawdd, Dolgellau, Gywnedd, LL40 2SG

12th September 2025

1 Person with appropriate technical expertise and permit details

This benefit statement has been compiled by Esther Koroma (Consultant at 4R Group) who has the following qualifications and experience:

- BSc. (Hons) in Chemistry
- I have several years' experience working as a Quality Control analyst for different scientific sectors including the water and agricultural industries.
- 3 years' experience working as an Environmental Consultant.
- FACTS Qualified Advisor (No. FE/ 7273)

Verified by Dawn Loos (Lead consultant at 4R Group).

Permit number under which this deployment application is being made: EPR/ GP3792SK

2 Where the waste is to be spread

Table 1. Where the waste is to be spread

Farm address:	Cefn Naw Clawdd, Dolgellau, Gywnedd, LL40 2SG	
Stockpile grid reference:	Refer to Table 4	
Area of the receiving land:	21.3 ha	
Quantity to be stored at any one time:	Stackable: NA	Non-Stackable: 1, 250 t
Total maximum quantity to be spread:	4, 425 t	
Location map document reference:	Location Plan – 2. Spreading Map_Cefn Naw Clawdd	

3 What is the waste to be spread?

Table 2. Description of waste(s) to be applied.

Waste	*EWC Code*	*Description*	*Waste Producer*	*Additional Information*
1.	19 09 02	Potable water treatment sludges from water clarification process	DCWW Bala	Non-stackable alum liquid sludge
2.	19 09 02	Potable water treatment sludges from water clarification process	DCWW Clifor	Non-stackable alum liquid sludge
3.	19 09 02	Potable water treatment sludges from water clarification process	DCWW Dolbenmaen	Non-stackable alum liquid sludge
4.	19 09 02	Potable water treatment sludges from water clarification process	DCWW Eithinfynydd	Non-stackable alum liquid sludge
5.	19 09 02	Potable water treatment sludges from water clarification process	DCWW Garreglwyd	Non-stackable ferric liquid sludge
6.	19 09 02	Potable water treatment sludges from water clarification process	DCWW Gwastadgoed	Non-stackable ferric liquid sludge
7.	19 09 02	Potable water treatment sludges from water clarification process	DCWW Llyn Conwy	Non-stackable ferric liquid sludge
8.	19 09 02	Potable water treatment sludges from water clarification process	DCWW Penybont	Non-stackable alum liquid sludge
9.	19 09 02	Potable water treatment sludges from water clarification process	DCWW Penycefn	Non-stackable alum liquid sludge
10.	19 09 02	Potable water treatment sludges from water clarification process	DCWW Rhiwgoch	Non-stackable ferric liquid sludge

4 Operational details

4.1 Cropping details

Table 3. Cropping details

Current crop including projected yield if known:	Refer to Tables 6-15 below
Is straw removed?	Y ☐ N ☐ N/A ☒
Following crop and any sensitive crops within rotation which you are amending the soil for in good time:	Refer to Tables 6- 15 below
When do you intend to apply this waste, e.g., post-harvest – pre-ploughing, during seed bed cultivations, on the stubble over winter:	Spreading will only take place subject to ground conditions and following the Code of Good Agricultural Practice (Defra, 2011), NVZ regulations and the permit holder's Environmental Management System (EMS).

	Spreading activities will also comply with the Spreading activities will also comply with The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021. Targeted periods of spreading on grass fields include early spring (late February – May), after cutting of silage, and prior to grazing through summer and autumn (September). No more than 50t/ha of waste will be spread on a field in any 3-week period in accordance with CoGAP, and no more than 250t/ha will be spread within any 12-month period.

4.2 Waste storage

Table 4. Waste storage

How is the waste to be stored? *e.g., mobile tank, field heap, spread on delivery*	Stackable wastes: NA Non-stackable wastes: spread on delivery where possible. Alternatively, stored at the below locations.
Where is the waste to be stored prior to spreading?	Below ground store: A. SH 76227 14918 Lagoon: B. SH 70968 18069 The Lagoon and below ground storage will be clean and emptied before the start of deployment and will be empty and cleaned before the expiration date of the deployment. Both storage locations are SAFO compliant and therefore do not require secondary containment. Additionally, there is no chance of overflow to the below ground store waste storage from adjacent cattle slurry storage, due to the farmers significantly low livestock numbers, resulting in low slurry levels. The wastes specified within this deployment are the only wastes to be stored in the proposed storage locations.
Why were these storage locations chosen?	The storage locations are accessible by delivering vehicle, near field entrances so the potential damage to fields by delivering vehicles is minimal. The storage locations are not within 10m of any ditch, watercourse, or footpath, not within a SPZ1, and are at least 50m from any well spring or borehole. They are also a safe distance from overhead powerlines. Storage locations are detailed on the spreading map.

4.3 Waste application

Table 5. Waste application

How is the waste to be spread and why is it to be spread that way?	Liquids and sludges will be surface spread by tractor and tanker using a low-trajectory splash plate / dribble bar trailing shoe or similar. Respect will be given to no spread zones and steeply sloping areas.
How do you plan to incorporate the waste following application?	There is no requirement for further incorporation of wastes on grass fields.
With liquid wastes is there any mole draining or sub-soiling planned? *Are there land drains in the field?*	No Yes
Other relevant operational information:	The wastes may be applied separately or in combination. If the wastes are applied in combination the total combined amount applied will not exceed 250t/ha, the total nitrogen loading will be less than 250kg/ha, and the amount of available nitrogen and total or available phosphate and potash (whichever is appropriate) will not exceed the fertiliser recommendation or the amount removed in crop offtake, whichever is the greater. **Please note that Alum sludge will only be applied to soils of pH 6 and above.** This is applicable to the following waste streams: DCWW Bala, DCWW Cilfor, DCWW Dolbenmaen, DCWW Eithin, DCWW Penybont and DCWW Penycefn. As a result, the area of receiving land for these wastes is 16.7 ha, as can be seen in the corresponding tables below.

Table 6. DCWW Bala sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
0865	5.2	3.6	Grass	Grass	**6.1**	M	175	1.5	3	20	65	6.7*	3	70	228	0.6*	3	0	3.5	250	**900**
9846	7.3	4.2	Grass	Grass	**6.2**	M	175	1.5	2	65	65	6.7*	2-	170	228	0.6*	2	0	3.5	250	**1050**
1416	2.7	2.1	Grass	Grass	**6.1**	M	175	1.5	3	20	65	6.7*	2-	170	228	0.6*	2	0	3.5	250	**525**
9216	2.1	1	Grass	Grass	**6.1**	M	175	1.5	3	20	65	6.7*	1	210	228	0.6	2	0	3.5	250	**250**
2585	6.5	5.8	Grass	Grass	**6.7**	M	175	1.5	3	20	65	6.7*	1	210	228	0.6	2	0	3.5	250	**1450**
Ha	**23.8**	**16.7**																			**3275**

Nutrient requirement based on values for 2 cuts of grass with grazing, described in RB209 (2023).

Grass crop use based on 2 grass cuts (25% DM) totalling 38 t/ha where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209 2023, Section 3).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha.

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 20%

Total N supplied at an application rate of 250 t/ha is 69.9 kg/ha

Table 7. DCWW Cilfor sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**pH**	**SNS**	**Req** kg/ha	**In Wst** kg/ha	**P Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**K Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**Mg Ind**	**Req** kg/ha	**In Wst** kg/ha	**Rate** t/ha	**Totals** tonnes
0865	5.2	3.6	Grass	Grass	**6.1**	M	175	0.9	3	20	65	31.8*	3	70	228	0.3*	3	0	1.3	70	**252**
9846	7.3	4.2	Grass	Grass	**6.2**	M	175	1.8	2	65	65	65*	2-	170	228	0.7*	2	0	2.6	143	**601**
1416	2.7	2.1	Grass	Grass	**6.1**	M	175	0.9	3	20	65	31.8*	2-	170	228	0.3*	2	0	1.3	70	**147**
9216	2.1	1	Grass	Grass	**6.1**	M	175	0.9	3	20	65	31.8*	1	210	228	0.3	2	0	1.3	70	**70**
2585	6.5	5.8	Grass	Grass	**6.7**	M	175	0.9	3	20	65	31.8*	1	210	228	0.3	2	0	1.3	70	**406**
Ha	**23.8**	**16.7**																			**1224**

Nutrient requirement based on values for 2 cuts of grass with grazing, described in RB209 (2023).

Grass crop use based on 2 grass cuts (25% DM) totalling 38 t/ha where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209 2023, Section 3).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha.

*__Total__ P_2O_5 and K_2O stated where soil indices ≥2

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 20%

Total N supplied at an application rate of 70t/ha is 30.2 kg/ha

Total N supplied at an application rate of 143 t/ha is 61.8 kg/ha

Table 8. DCWW Dolbenmaen sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**pH**	**SNS**	**Req** kg/ha	**In Wst** kg/ha	**P Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**K Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**Mg Ind**	**Req** kg/ha	**In Wst** kg/ha	**Rate** t/ha	**Totals** tonnes
0865	5.2	3.6	Grass	Grass	**6.1**	M	175	1.6	3	20	65	31.4*	3	70	228	0.6*	3	0	0.3	220	**792**
9846	7.3	4.2	Grass	Grass	**6.2**	M	175	1.8	2	65	65	35.7*	2-	170	228	0.7*	2	0	0.4	250	**1050**
1416	2.7	2.1	Grass	Grass	**6.1**	M	175	1.6	3	20	65	31.4*	2-	170	228	0.6*	2	0	0.3	220	**462**
9216	2.1	1	Grass	Grass	**6.1**	M	175	1.6	3	20	65	31.4*	1	210	228	0.5	2	0	0.3	220	**220**
2585	6.5	5.8	Grass	Grass	**6.7**	M	175	1.6	3	20	65	31.4*	1	210	228	0.5	2	0	0.3	220	**1276**
Ha	**23.8**	**16.7**																			**3008**

Nutrient requirement based on values for 2 cuts of grass with grazing, described in RB209 (2023).

Grass crop use based on 2 grass cuts (25% DM) totalling 38 t/ha where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209 2023, Section 3).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha.

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 20%

Total N supplied at an application rate of 220 t/ha is 40.8 kg/ha

Total N supplied at an application rate of 250 t/ha is 46.3 kg/ha

Table 9. DCWW Eithinfynydd sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**pH**	**SNS**	**Req** kg/ha	**In Wst** kg/ha	**P Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**K Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**Mg Ind**	**Req** kg/ha	**In Wst** kg/ha	**Rate** t/ha	**Totals** tonnes
0865	5.2	3.6	Grass	Grass	**6.1**	M	175	1.1	3	20	65	32.2*	3	70	228	1.3*	3	0	0.6	175	**630**
9846	7.3	4.2	Grass	Grass	**6.2**	M	175	1.5	2	65	65	46*	2-	170	228	1.8*	2	0	0.9	250	**1050**
1416	2.7	2.1	Grass	Grass	**6.1**	M	175	1.1	3	20	65	32.2*	2-	170	228	1.3*	2	0	0.6	175	**368**
9216	2.1	1	Grass	Grass	**6.1**	M	175	1.1	3	20	65	32.2*	1	210	228	1.1	2	0	0.6	175	**175**
2585	6.5	5.8	Grass	Grass	**6.7**	M	175	1.1	3	20	65	32.2*	1	210	228	1.1	2	0	0.6	175	**1015**
Ha	**23.8**	**16.7**																			**2608**

Nutrient requirement based on values for 2 cuts of grass with grazing, described in RB209 (2023).

Grass crop use based on 2 grass cuts (25% DM) totalling 38 t/ha where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209 2023, Section 3).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha.

*__Total__ P_2O_5 and K_2O stated where soil indices ≥2

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 20%

Total N supplied at an application rate of 250 t/ha is 73.1 kg/ha

Total N supplied at an application rate of 175 t/ha is 51.2 kg/ha

Table 10. DCWW Garreglwyd sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**pH**	**SNS**	**Req** kg/ha	**In Wst** kg/ha	**P Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**K Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**Mg Ind**	**Req** kg/ha	**In Wst** kg/ha	**Rate** t/ha	**Totals** tonnes
0865	5.2	3.6	Grass	Grass	**6.1**	M	175	1.5	3	20	65	32.4*	3	70	228	1.3*	3	0	1.9	239	**860**
9846	7.3	4.2	Grass	Grass	**6.2**	M	175	1.5	2	65	65	33.9*	2-	170	228	1.4*	2	0	2	250	**1050**
1416	2.7	2.1	Grass	Grass	**6.1**	M	175	1.5	3	20	65	32.4*	2-	170	228	1.3*	2	0	1.9	239	**502**
9216	2.1	1	Grass	Grass	**6.1**	M	175	1.5	3	20	65	32.4*	1	210	228	1.2	2	0	1.9	239	**239**
1113	2.2	2.1	Grass	Grass	**5.8**	M	175	1.5	3	20	65	32.4*	1	210	228	1.2	2	0	1.9	239	**502**
0264	2.9	2.5	Grass	Grass	**5.9**	M	175	1.5	3	20	65	32.4*	1	210	228	1.2	3	0	1.9	239	**598**
2585	6.5	5.8	Grass	Grass	**6.7**	M	175	1.5	3	20	65	32.4*	1	210	228	1.2	2	0	1.9	239	**1386**
Ha	**28.9**	**21.3**																			**4277**

Nutrient requirement based on values for 2 cuts of grass with grazing, described in RB209 (2023).

Grass crop use based on 2 grass cuts (25% DM) totalling 38 t/ha where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209 2023, Section 3).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha.

*__Total__ P_2O_5 and K_2O stated where soil indices ≥2

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 20%

Total N supplied at an application rate of 250 t/ha is 78.1 kg/ha

Total N supplied at an application rate of 239 t/ha is 74.7 kg/ha

Table 11. DCWW Gwastadgoed sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**pH**	**SNS**	**Req** kg/ha	**In Wst** kg/ha	**P Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**K Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**Mg Ind**	**Req** kg/ha	**In Wst** kg/ha	**Rate** t/ha	**Totals** tonnes
0865	5.2	3.6	Grass	Grass	**6.1**	M	175	0.9	3	20	65	32.1*	3	70	228	1*	3	0	0.9	140	**504**
9846	7.3	4.2	Grass	Grass	**6.2**	M	175	1.5	2	65	65	57.4*	2-	170	228	1.8*	2	0	1.5	250	**1050**
1416	2.7	2.1	Grass	Grass	**6.1**	M	175	0.9	3	20	65	32.1*	2-	170	228	1*	2	0	0.9	140	**294**
9216	2.1	1	Grass	Grass	**6.1**	M	175	0.9	3	20	65	32.1*	1	210	228	0.9	2	0	0.9	140	**140**
1113	2.2	2.1	Grass	Grass	**5.8**	M	175	0.9	3	20	65	32.1*	1	210	228	0.9	2	0	0.9	140	**294**
0264	2.9	2.5	Grass	Grass	**5.9**	M	175	0.9	3	20	65	32.1*	1	210	228	0.9	3	0	0.9	140	**350**
2585	6.5	5.8	Grass	Grass	**6.7**	M	175	0.9	3	20	65	32.1*	1	210	228	0.9	2	0	0.9	140	**812**
Ha	**28.9**	**21.3**																			**2940**

Nutrient requirement based on values for 2 cuts of grass with grazing, described in RB209 (2023).

Grass crop use based on 2 grass cuts (25% DM) totalling 38 t/ha where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209 2023, Section 3).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha.

*__Total__ P_2O_5 and K_2O stated where soil indices ≥2

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 20%

Total N supplied at an application rate of 250 t/ha is 47.5 kg/ha

Total N supplied at an application rate of 140 t/ha is 26.6 kg/ha

Table 12. DCWW Llyn Conwy sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**pH**	**SNS**	**Req** kg/ha	**In Wst** kg/ha	**P Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**K Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**Mg Ind**	**Req** kg/ha	**In Wst** kg/ha	**Rate** t/ha	**Totals** tonnes
0865	5.2	3.6	Grass	Grass	**6.1**	M	175	1.5	3	20	65	26.5*	3	70	228	1.2*	3	0	1.2	250	**900**
9846	7.3	4.2	Grass	Grass	**6.2**	M	175	1.5	2	65	65	26.5*	2-	170	228	1.2*	2	0	1.2	250	**1050**
1416	2.7	2.1	Grass	Grass	**6.1**	M	175	1.5	3	20	65	26.5*	2-	170	228	1.2*	2	0	1.2	250	**525**
9216	2.1	1	Grass	Grass	**6.1**	M	175	1.5	3	20	65	26.5*	1	210	228	1.1	2	0	1.2	250	**250**
1113	2.2	2.1	Grass	Grass	**5.8**	M	175	1.5	3	20	65	26.5*	1	210	228	1.1	2	0	1.2	250	**525**
0264	2.9	2.5	Grass	Grass	**5.9**	M	175	1.5	3	20	65	26.5*	1	210	228	1.1	3	0	1.2	250	**625**
2585	6.5	5.8	Grass	Grass	**6.7**	M	175	1.5	3	20	65	26.5*	1	210	228	1.1	2	0	1.2	250	**1450**
Ha	**28.9**	**21.3**																			**4425**

Nutrient requirement based on values for 2 cuts of grass with grazing, described in RB209 (2023).

Grass crop use based on 2 grass cuts (25% DM) totalling 38 t/ha where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209 2023, Section 3).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha.

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 20%

Total N supplied at an application rate of 250 t/ha is 61.2 kg/ha

Table 13. DCWW Penybont sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**pH**	**SNS**	**Req kg/ha**	**In Wst kg/ha**	**P Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**K Ind**	**Req kg/ha**	**Crop Use kg/ha**	**In Wst kg/ha**	**Mg Ind**	**Req kg/ha**	**In Wst kg/ha**	**Rate t/ha**	**Totals tonnes**
0865	5.2	3.6	Grass	Grass	**6.1**	M	175	0.6	3	20	65	31.7*	3	70	228	0.6*	3	0	0.9	95	**342**
9846	7.3	4.2	Grass	Grass	**6.2**	M	175	1.2	2	65	65	64.7*	2-	170	228	1.2*	2	0	1.8	194	**815**
1416	2.7	2.1	Grass	Grass	**6.1**	M	175	0.6	3	20	65	31.7*	2-	170	228	0.6*	2	0	0.9	95	**200**
9216	2.1	1	Grass	Grass	**6.1**	M	175	0.6	3	20	65	31.7*	1	210	228	0.5	2	0	0.9	95	**95**
2585	6.5	5.8	Grass	Grass	**6.7**	M	175	0.6	3	20	65	31.7*	1	210	228	0.5	2	0	0.9	95	**551**
Ha	**23.8**	**16.7**																			**1660**

Nutrient requirement based on values for 2 cuts of grass with grazing, described in RB209 (2023).

Grass crop use based on 2 grass cuts (25% DM) totalling 38 t/ha where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209 2023, Section 3).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha.

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 20%

Total N supplied at an application rate of 194 t/ha is 44.6 kg/ha

Total N supplied at an application rate of 95 t/ha is 21.8 kg/ha

Table 14. DCWW Penycefn sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**pH**	**SNS**	**Req** kg/ha	**In Wst** kg/ha	**P Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**K Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**Mg Ind**	**Req** kg/ha	**In Wst** kg/ha	**Rate** t/ha	**Totals** tonnes
0865	5.2	3.6	Grass	Grass	**6.1**	M	175	1	3	20	65	32.5*	3	70	228	0.5*	3	0	0.7	169	**608**
9846	7.3	4.2	Grass	Grass	**6.2**	M	175	1.5	2	65	65	48.1*	2-	170	228	0.7*	2	0	1.1	250	**1050**
1416	2.7	2.1	Grass	Grass	**6.1**	M	175	1	3	20	65	32.5*	2-	170	228	0.5*	2	0	0.7	169	**355**
9216	2.1	1	Grass	Grass	**6.1**	M	175	1	3	20	65	32.5*	1	210	228	0.4	2	0	0.7	169	**169**
2585	6.5	5.8	Grass	Grass	**6.7**	M	175	1	3	20	65	32.5*	1	210	228	0.4	2	0	0.7	169	**980**
Ha	**23.8**	**16.7**																			**2554**

Nutrient requirement based on values for 2 cuts of grass with grazing, described in RB209 (2023).

Grass crop use based on 2 grass cuts (25% DM) totalling 38 t/ha where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209 2023, Section 3).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha.

***Total** P_2O_5 and K_2O stated where soil indices ≥2

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 20%

Total N supplied at an application rate of 250 t/ha is 92.5 kg/ha

Total N supplied at an application rate of 169 t/ha is 62.5 kg/ha

Table 15. DCWW Rhiwgoch sludge

						N			P_2O_5				K_2O				Mg				
Field Reference	**Total Area**	**Sprd Area**	**Previous Crop**	**Next Crop**	**pH**	**SNS**	**Req** kg/ha	**In Wst** kg/ha	**P Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**K Ind**	**Req** kg/ha	**Crop Use** kg/ha	**In Wst** kg/ha	**Mg Ind**	**Req** kg/ha	**In Wst** kg/ha	**Rate** t/ha	**Totals** tonnes
0865	5.2	3.6	Grass	Grass	**6.1**	M	175	0.7	3	20	65	32.5*	3	70	228	0.6*	3	0	0.7	113	**407**
9846	7.3	4.2	Grass	Grass	**6.2**	M	175	1.4	2	65	65	64.8*	2-	170	228	1.2*	2	0	1.4	225	**945**
1416	2.7	2.1	Grass	Grass	**6.1**	M	175	0.7	3	20	65	32.5*	2-	170	228	0.6*	2	0	0.7	113	**237**
9216	2.1	1	Grass	Grass	**6.1**	M	175	0.7	3	20	65	32.5*	1	210	228	0.5	2	0	0.7	113	**113**
1113	2.2	2.1	Grass	Grass	**5.8**	M	175	0.7	3	20	65	32.5*	1	210	228	0.5	2	0	0.7	113	**237**
0264	2.9	2.5	Grass	Grass	**5.9**	M	175	0.7	3	20	65	32.5*	1	210	228	0.5	3	0	0.7	113	**283**
2585	6.5	5.8	Grass	Grass	**6.7**	M	175	0.7	3	20	65	32.5*	1	210	228	0.5	2	0	0.7	113	**655**
Ha	**28.9**	**21.3**																			**2471**

Nutrient requirement based on values for 2 cuts of grass with grazing, described in RB209 (2023).

Grass crop use based on 2 grass cuts (25% DM) totalling 38 t/ha where 1.7kg/t P_2O_5 and 6.0kg/t K_2O removed in offtake (RB209 2023, Section 3).

N, P_2O_5, K_2O and Mg stated are **available** concentrations in units of kg/ha.

*__Total__ P_2O_5 and K_2O stated where soil indices ≥2

Availablity of nutrients in waste - N measured as NH_4, P_2O_5 50%, K_2O 90%, Mg 20%

Total N supplied at an application rate of 225 t/ha is 61 kg/ha

Total N supplied at an application rate of 113 t/ha is 30.6 kg/ha

5 Compliance with NVZ regulations

Table 10. Compliance with NVZ regulations

<table>
<tr><td>Does the site fall within a designated NVZ?</td><td>Y ☒ N ☐ (Please skip to section 6)</td></tr>
<tr><td>Do closed periods apply for the wastes to be applied?</td><td>Y ☐ N ☒

Applicable to: N/A

If yes, please indicate the appropriate period:

<table>
<tr><th>Start Date</th><th>End Date</th><th>Land Use</th><th>Soil Type</th><th></th></tr>
<tr><td>1st Aug</td><td>31st Dec</td><td>Tillage Land</td><td>Shallow/Sandy</td><td>☐</td></tr>
<tr><td>1st Sept</td><td>31st Dec</td><td>Grassland</td><td>Shallow/Sandy</td><td>☐</td></tr>
<tr><td>16th Sept</td><td>31st Dec</td><td>Tillage Land*</td><td>Shallow/Sandy</td><td>☐</td></tr>
<tr><td>1st Oct</td><td>31st Jan</td><td>Tillage Land</td><td>All Other Soils</td><td>☐</td></tr>
<tr><td>15th Oct</td><td>31st Jan</td><td>Grassland</td><td>All Other Soils</td><td>☐</td></tr>
</table>

*For Tillage Land with crops sown on or before 15th September

If no, applications will be carried out as per CoGAP i.e., when ground conditions are suitable and when no heavy rain is forecast.</td></tr>
<tr><td>Will application rates comply with crop requirement and field/whole farm limit?</td><td>Refer to Tables 6 – 15</td></tr>
<tr><td>Previous applications:</td><td>See attached ‘1.1 Previous Spreading_Cefn Naw Clawdd (2025)’.</td></tr>
</table>

6 Benefits and nutrients supplied to the soil or crop from this application.

6.1 Receiving soils

The nutrient status of individual fields to be registered are provided in Tables 6-15 above. General soil type(s) for the fields to be registered are slowly permeable wet upland soils with a peaty surface.

Table 12. Soil type

Light sand soils	Soils which are sand, loamy sand or sandy loam to 40cm depth and are sand or loamy sand between 40 and 80 cm, or over sandstone rock.	☐
Shallow soils	Soils over impermeable subsoils and those where the parent rock (chalk, limestone, or other rock) is within 40cm of the soil surface. Sandy soils developed over sandstone rock should be regarded as light sand soils.	☐
Medium soils	Mostly medium-textured mineral soils that do not fall into any other soil category. This includes sandy loams over clay, deep loams, and silty or clayey topsoils that have sandy or loamy subsoils.	☒
Deep clayey soils	Soils with predominantly sandy clay loam, silty clay loam, clay loam, sandy clay, silty clay, or clay topsoil overlying clay subsoil to more than 40cm depth. Deep clayey soils normally need artificial field drainage.	☐
Deep silty soils	Soils of sandy silt loam, silt loam, or silty clay loam textures to 100 cm depth or more. Silt soils formed on marine alluvium, warp soils (river alluvium) and brickearth soils are in this category. Silty clays of low fertility should be regarded as other mineral soils.	☐
Organic soils	Soils that are predominantly mineral but with between 10 and 20% organic matter to depth. These can be distinguished by darker colouring that stains the fingers black or grey.	☐
Peat soils	Soils that contain more than 20% organic matter derived from sedge or similar peat material.	☐

The soil analyses (**Soil Analysis**) show the soils to have ample background concentrations of Mg (*i.e.,* ADAS Index 2-3).

6.2 Waste characterisation

Full characterisations of individual wastes with total and available nutrients at the recommended rates for each waste stream are supplied in **Waste Analysis**. This information is further summarised against the nutrient requirements for proposed crops in Tables 6-15 above.

Limiting factors

The limiting factor for DCWW Bala sludge is the maximum application rate of 250 t/ha.

The application rates for all the other wastes are limited by the phosphate indices which are at and above target levels.

At P index 2, the application rates are limited to not exceed the crop offtake. At P Index of 3, the application rates are limited to not exceed the crop requirement.

Important information

- DCWW report all their analysis on a dry matter basis, including the liquid treatment sludges, unless otherwise stated.
- The moisture content at time of analysis is indicative of whether the sludge is a cake or a liquid. Typically, the sludge cake samples contain a significantly higher dry matter content than the liquid sludges. Please refer to table 2 (page 2) which includes details of the physical state of each waste.

6.3 Summary of benefits

These wastes are a source of essential elements N, P, K, macronutrients Mg, Ca, S and provide trace amounts of micronutrients. Wastes are beneficially used to replace a proportion of the bagged mineral fertiliser used by farmers. The recommended application rates shown in Tables 6-15 are based on the crop requirement and soil analysis.

Clean water treatment sludges contain significant amounts of organic matter. Additions of organic matter to soil will improve soil structural stability, biological activity, water, and nutrient holding capacity, i.e., resistance to drought, and reduction of localised flooding, reduced leaching of nutrients, and improved workability in soil. Organic matter is a particularly good source of N and S, and organic acids that aid nutrient solubility and uptake, as well as enhancing microbial activity for enhanced nutrient cycling in soils.

6.4 Additional requirements

Fields may require additional N, P and K to achieve optimum yield.

7 Potential negative impacts to the soil or crop from this application

7.1 Potentially Toxic Elements (PTEs)

All the wastes contain traces of PTEs; however, concentrations applied to the receiving soils are below maximum upper limits for heavy metal applications described in the Sludge (Use in Agriculture) Regulations 1989 (SI, 1989). Refer to interpretations in **Waste Analysis**.

The potable water treatment sludges contain varying amounts of Al and Fe due to the flocculation process in the water treatment. At low pH (<6.0), aluminium can potentially transform into the toxic Al^{3+} species, it is therefore necessary to avoid spreading Al flocculated wastes on fields with pH <6.0 as this can cause stunt root growth and induced phosphate deficiency in crops. Additionally, care will be taken to prevent the waste entering a watercourse because aluminium can harm aquatic life. This will be achieved through observing buffer zones as per the location plan. Also, watercourses will be checked before, during and following spreading.

Iron flocculated wastes also have potential disbenefits if applied to inappropriate soils. Spreading high Fe wastes onto soils with pH < 5.0 is not recommended. Spreading onto fields with soil pH between 5.0- 5.5 requires consideration and possible mitigation. Due to potential for Fe-oxide formation which can reduce P_2O_5 mobility, spreading of Fe-flocculated wastes onto fields that are pH 5.0-5.5 has been avoided.

7.2 Other waste characteristics

The pH levels in the wastes range from 5.6- 6.9.

It is unlikely that soil pH will decrease following the application detailed here due to the extensive buffering capacity of the receiving soils. The pH levels of the receiving soils are between 5.8 and 6.7, therefore it is unlikely that availability of any naturally occurring heavy metals present in these soils will become more available after application of these wastes.

7.3 Operational factors

1. Liquids and sludges will be surface spread by tractor and tanker using a low-trajectory splash plate / dribble bar trailing shoe or similar.
2. Potential compaction of receiving soil will be mitigated by suitable adjustment of tyres/tyre pressure to match soil conditions, direction of spreading and load to be spread.
3. Wastes will be applied when ground and weather conditions are suitable, following CoGAP to avoid soil damage including wheel ruts, compaction, structural damage, erosion, and run-off.

8 Sensitive human and environmental receptors

Please refer to site specific risk assessment (**CNC SSRA**). Locations of sensitive receptors are shown in **Cefn Naw Clawdd Maps**. Prevailing winds are south-westerly.

As well as the designated sites included in the site-specific risk assessment, other sensitive areas have been accounted for. Flood risk areas at Glyn Farm have been designated as non-spreading, and fields at Tan-y-Coed Uchaf are over 500m downstream of a source protection zone (SPZ). For the Cadair Idris SSSI, where it borders some of the fields there will be a 20m non spreading buffer zone put in place.

Flood risks to fields 0865,9846,1416,9216,1113,0264 & 2585 have also been addressed within the SSRA.

2.

9 Practices to reduce the impacts of the operation on identified sensitive receptors.

Mitigation measures to safeguard site-specific high and moderate likelihood of emission detection by sensitive receptors are shown in **CNC SSRA**. Generic measures (in addition to permit requirements and following the EMS) to reduce potential negative impacts of the proposed spreading operation will be as follows:

1. Spreading will only be undertaken when weather conditions are suitable within restrictions outlined in CoGAP and any relevant closed periods.
2. Spreading will not be carried out in any areas of a field that will be sub-soiled.
3. Machinery operations will take account of soil conditions, slopes *etc.*
4. Liquid spreading machinery will be turned off and lifted away from soil prior to turning at the end of each run.
5. Machinery will be checked daily when in use, regularly serviced and spreading equipment calibrated. Umbilical hoses will be regularly checked for damage to prevent leaks.
6. Machinery turns will not be executed in the buffer strips.
7. Waste deliveries to field/stores will be supervised.
8. All spillages will be reported immediately to NRW.

10 Contingency planning

1. Replacement spreading machinery will be available to prevent waste being retained in faulty machinery. Hire vehicles will be used if required. All machinery will be fully serviced.

2. There will be enough trained staff available to ensure that the operation continues throughout operational hours (*i.e.,* there will be sufficient cover for illness, holiday *etc.*).
3. In adverse weather, storage is available until ground/weather conditions become favourable for land application.
4. In circumstances where the wastes cannot be stored or spread beyond normal capacities, wastes will be diverted to a local alternative deployment or DCWW sewage treatment works.

11 Nominated Competent Person

The NCP works remotely to the 4R Office in Newent and is available to be on site within 2 hours of the spreading time. They will also be on site within 4 hours at any other time in accordance with rule 1.1.1 of the Landspreading: how to comply with your permit guidance.