Statement of Agricultural Benefit – Castell Malgwyn Farm (3)

Applicant: Mr Daniel James and Mrs Carys James (Stepside Agricultural Contractors)
Permit: SR2010 No4: mobile plant for land-spreading
Permit number: EPR/AB3891CX

Agricultural benefit statement is prepared by:

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This agricultural benefit statement has been prepared based on information provided by Stepside Agricultural Contractors. It is made on the understanding that all information provided is correct and representative of the fields to which the material is to be applied and of the waste material to be applied.

Farm address:

Castell Malgwyn Farm, Llechryd, Cardigan, Pembrokeshire, SA43 2QB

Wastes to be applied:

Waste Code	Waste Description	Physical Form	Waste Producer
02 05 02	Waste from the dairy products industry – sludges from on-site effluent treatment	Liquid sludge	Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) *
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Strata Florida WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Bontgoch WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Bryngwyn WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Capel Dewi WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Cefn Dryscoed WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Cray WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Hirwaun WTW
19 09 02	Sludge from water clarification	Liquid sludge	Dwr Cymru Welsh Water Llechryd WTW

* Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant - Volac International Limited has been acquired by Arla Foods Ingredients. Sensient Flavours Limited is no longer operational at the Felinfach site. A permit variation is pending to reflect these operational and ownership changes as discussed with NRW.

Application:

- The fields will be spread into the growing grass crops in February - April 2027 prior to first cut silage, and immediately after silage cuts and in advance of periods of grazing May – September 2027. Spreading of these grass fields may be split into up to 5 separate applications. Each individual application will not exceed 50t/ha in any one application to a field.
- Spreading of the waste will be carried out in accordance with the Code of Good Agricultural Practice, The Water Resources (Control of Agricultural Pollution) (Wales) Regulations 2021 and in accordance with the requirements of the deployment and Environmental Permitting Regulations.
- The fields aren't to be cut or grazed for at least 3 weeks following application.
- NRW will be informed at least 48 hours prior to any spreading commencing and no spreading will occur within 48 hours of forecasted heavy rainfall.
- The liquid sludges are delivered by HGV road tankers which are discharged into a nurse tank, pumped from a nurse tank to the slurry bag with hose, or discharged into a concrete above ground slurry store at the farmyard prior to spreading. Liquid sludge is spread from a nurse tank, slurry bag or the concrete above ground slurry store at the farmyard onto the deployed fields at the required timings as stated above. This is done by either umbilical method with the liquid delivered to tractor in deployed fields pumped through hose and spread by dribble bar applicator mounted onto the back of the tractor, or a tractor and vacuum tanker with dribble bar applicator. The dribble bar applicator places the liquid in bands onto the surface of the ground. This spread method is effective in limiting odour generation & nutrient losses associated with higher trajectory spread methods such as splash plate. Spreading is undertaken with the use of flow meters to ensure correct rates are applied.
- Should the timing, ground or weather conditions mean it's unsuitable for spreading then temporary storage of liquid sludge in nurse tanks, slurry bag, or concrete above ground slurry store at farmyard may be required. These potential locations are detailed on the attached field maps & within the LPD1 form.
- The nurse tanks do not have secondary containment, but are impermeable purpose built AW Trailers alloy nurse tanks featuring internal bracing, an anti-corrosive interior coating, designated fill and empty valves that can be shut by gate valves. These valves can be locked off in the event of temporary overnight temporary storage if the tank contains liquid to ensure secure temporary storage. The tanks are normally in use just prior to or when spreading activity is being undertaken. In most cases the nurse tanks are unlikely to contain liquid overnight. The tank fills from the top via internal pipework with a 'swanneck' reducing chances off any spills when decoupling connecting pipes after filling. The empty valve allows the tank to be completely emptied to the bottom. The tank is sealed with roof to prevent odour, rainwater entering the tank and for safety, and can be vented if required. A hydraulic lifting axle in the middle allows the tank to positioned and lowered, then locked into position so the whole tank is on the ground.
- The Labaronne Citaf self-supporting slurry bag is purpose built, sealed, can be vented and has designated fill and empty valves and is sited on a suitable flat area. The bag has a 10 year manufacturer guarantee: 100% against all material (technical fabric) and manufacturing (welding) defects. The technical fabric is composed of polyester coated with PVC and protected with an anti UV treatment on both sides. The bag has a life expectancy of 20 years +. The liquid is pumped across to the bag from a nurse tank or pumped from a lorry using a pump and lay flat hose across field connected to the bag fill valve. There are 2 gate valves in sequence over a metre apart and a non return valve. The bag features a number of degassers with anti-odour filters. The slurry bag will have a soil bund around the perimeter and will be fenced to prevent access & damage.
- The concrete above ground slurry store at the farmyard is impermeable with concrete sides and base and has fill and empty valves. The tank has an open top and a 30cm minimum freeboard will be maintained at all times.
- The nurse tanks, slurry bag and concrete above ground slurry store will be completely empty before use. Only waste as specified in this deployment will be stored in the nurse tanks and slurry bag. The concrete above ground slurry store at the farmyard will be completely empty of any cattle slurry before use, with no cattle slurry added whilst in use to store waste under this deployment.
- The maximum application rate in Table 1 for each field will be split into multiple applications where it's over 50t/ha. Each individual application will not exceed 50t/ha in any one application to a field.
- Liquid wastes of the same waste code may be stored together as a mix in the concrete above ground slurry store at the farmyard for operational purposes.
- The wastes may be applied separately or in combination to a field.
- The maximum application rates for each field listed in Table 1 apply to an individual waste being applied to a field and have been made on a field by field basis using The Nutrient Management Guide (RB209).

Benefits from waste application:

- The analysis and nutrient content of the wastes are shown in the waste analysis attachments.
- The wastes are a source of nitrogen, phosphate, potassium, sulphur and organic matter. The wastes can be beneficially used to replace a proportion of bagged mineral fertiliser.
- The risk of sulphur deficiency has been estimated as 'High' based on the soil texture and expected winter rainfall (RB209). The crop requirements are 80kg SO_3/ha. The amount of available sulphur supplied by the wastes at the proposed maximum application rates is 1-24kg SO_3/ha.
- The addition of organic matter to the soil will help 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.

Materials applied in previous 12 months:

The fields within this deployment application have received the rates (t/ha) of materials as in 'Table 4 - Previous Land Treatment' within the previous 12 months.

It's considered that the nutrients applied from these applications were for the requirements of the previous crops before the material within this deployment is applied for the next crops.

Nutrients supplied by this application:

The recommended maximum application rates for each individual waste when applied on it's own to a field are shown in Table 1 and below. The rates have been made on a field by field basis using The Nutrient Management Guide (RB209).

Rates of application (t/ha)	**Nitrogen kg/ha**		**Phosphate (P_2O_5) kg/ha**		**Potash (K_2O) kg/ha**		**Magnesium (MgO) kg/ha**		**Sulphur (SO_3) kg/ha**	
	Total	Available	Total	Available	Total	Available	Total	Available	Total	Available
Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) - sludge from on-site effluent treatment @ 50 t/ha	15	3	20	12	16	13	3	0	5	1
Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) - sludge from on-site effluent treatment @ 100 t/ha	30	6	41	24	33	26	6	1	11	2
Estimated Availability	20%		60%		80%		10%		20%	

Rates of application (t/ha)	Nitrogen kg/ha		Phosphate (P_2O_5) kg/ha		Potash (K_2O) kg/ha		Magnesium (MgO) kg/ha		Sulphur (SO_3) kg/ha	
	Total	Available	Total	Available	Total	Available	Total	Available	Total	Available
DCWW Bontgoch WTW liquid sludge @ 86 t/ha	20	2	65	13	2	0	6	1	28	3
DCWW Bontgoch WTW liquid sludge @ 230 t/ha	54	5	173	35	5	1	17	3	74	7
DCWW Bryngwyn WTW liquid sludge @ 244 t/ha	38	4	65	13	5	1	5	1	78	8
DCWW Bryngwyn WTW liquid sludge @ 250 t/ha	39	4	67	13	5	1	5	1	80	8
DCWW Capel Dewi WTW liquid sludge @ 133 t/ha	29	3	35	7	5	1	20	4	39	4
DCWW Cefn Dryscoed WTW liquid sludge @ 243 t/ha	64	6	65	13	5	1	4	1	230	23
DCWW Cefn Dryscoed WTW liquid sludge @ 250 t/ha	66	7	67	13	5	1	4	1	237	24
DCWW Cray WTW liquid sludge @ 241 t/ha	51	5	65	13	5	1	7	1	64	6
DCWW Cray WTW liquid sludge @ 250 t/ha	53	5	67	13	5	1	7	1	66	7
DCWW Hirwaun WTW liquid sludge @ 244 t/ha	71	7	65	13	5	1	12	2	138	14
DCWW Llechryd WTW liquid sludge @ 97 t/ha	40	4	61	12	5	1	20	4	35	3
DCWW Strata Florida WTW liquid sludge @ 242 t/ha	60	6	65	13	5	1	3	1	75	8
DCWW Strata Florida WTW liquid sludge @ 250 t/ha	62	6	67	13	5	1	3	1	78	8
Estimated Availability	10%		20%		20%		20%		10%	

Application of wastes in combination:

When different wastes are applied to the same field the maximum application rates will be set so that the total combined amount applied will not exceed 250 t/ha, the total nitrogen loading will be less than 250 kg/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 (as listed in Table 1), whichever is the greater, and total magnesium applied will not be more than 20 kg/ha.

The following example shows the maximum rate of application and nutrient content applied based on 120t/ha DCWW Bryngwyn liquid water clarification sludge and 120t/ha DCWW Cray WTW liquid water clarification sludge being applied in total of all applications to the same field (no more than 50t/ha of liquid sludge spread in a single application).

	Rate of application (t/ha)	Nitrogen kg/ha		Phosphate (P_2O_5) kg/ha		Potash (K2O) kg/ha		Magnesium (MgO) kg/ha		Sulphur (SO3) kg/ha	
		Total	Available	Total	Available	Total	Available	Total	Available	Total	Available
DCWW Bryngwyn WTW liquid sludge	120	19	2	32	6	2	0	2	0	38	4
DCWW Cray WTW liquid sludge	120	25	3	32	6	3	1	3	1	32	3
TOTAL	**240**	**44**	**5**	**64**	**12**	**5**	**1**	**5**	**1**	**70**	**7**

Table 1: Field, Soil & Cropping Details, Fertiliser Recommendations and Application Rates

					Nitrogen		Phosphate			Potash			Magnesium	
Field Ref.	Soil Type	Spreadable Area (ha)	Previous Crop	Next Crop	SNS	N Required (kg/ha)	P Index	P_2O_5 Required (kg/ha)	Crop Use (Offtake) (kg/ha)	K Index	K_2O Required (kg/ha)	Crop Use (Offtake) (kg/ha)	Mg Index	MgO Required (kg/ha)
CASTELL MALGWYN 1	Medium soils	4.40	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	1	95	65	2-	230	228	3	0
CASTELL MALGWYN 7	Medium soils	1.30	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	1	95	65	2-	230	228	4	0
CASTELL MALGWYN 19	Medium soils	5.80	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	1	95	65	2-	230	228	4	0
CASTELL MALGWYN 22	Medium soils	4.40	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	1	95	65	2-	230	228	3	0
CASTELL MALGWYN 23	Medium soils	4.40	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	2	65	65	2-	230	228	3	0
CASTELL MALGWYN 24	Medium soils	4.50	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	1	95	65	2-	230	228	2	0
CASTELL MALGWYN 25	Medium soils	3.60	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	1	95	65	2-	230	228	3	0
CASTELL MALGWYN 26	Medium soils	2.80	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	2	65	65	1	270	228	3	0
CASTELL MALGWYN 27	Medium soils	2.80	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	2	65	65	1	270	228	3	0
CASTELL MALGWYN 28	Medium soils	2.30	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	2	65	65	1	270	228	2	0
CM 3169	Medium soils	2.80	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	1	95	65	0	320	228	3	0
CM 0438	Medium soils	5.10	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	0	125	65	0	320	228	2	0
CM 0165	Medium soils	4.10	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	0	125	65	0	320	228	3	0
TOTAL		**48.30**												

Nutrient requirements based on:
Grass 2 cuts silage (23t FW/ha at 1st cut, 15t FW/ha at 2nd cut), silage 25% DM, totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake + grazing
Expected DM yields of grass 9-12t/ha, good growth class

	Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) - sludge from on site effluent treatment						Dwr Cymru Welsh Water Strata Florida WTW - liquid water clarification sludge						Dwr Cymru Welsh Water Bontgoch WTW - liquid water clarification sludge					
Field Ref.	N Applied - Waste (kg/ha)	P_2O_5 Applied - Waste (kg/ha)	K_2O Applied - Waste (kg/ha)	MgO Applied - Waste (kg/ha)	Application Rate (t/ha)	Total Tonnes	N Applied - Waste (kg/ha)	P_2O_5 Applied - Waste (kg/ha)	K_2O Applied - Waste (kg/ha)	MgO Applied - Waste (kg/ha)	Application Rate (t/ha)	Total Tonnes	N Applied - Waste (kg/ha)	P_2O_5 Applied - Waste (kg/ha)	K_2O Applied - Waste (kg/ha)	MgO Applied - Waste (kg/ha)	Application Rate (t/ha)	Total Tonnes
CASTELL MALGWYN 1	**6	**24	*33	*6	100	440	**6	**13	*5	*3	250	1100	**5	**35	*5	*17	230	1012
CASTELL MALGWYN 7	**6	**24	*33	*6	100	130	**6	**13	*5	*3	250	325	**5	**35	*5	*17	230	299
CASTELL MALGWYN 19	**6	**24	*33	*6	100	580	**6	**13	*5	*3	250	1450	**5	**35	*5	*17	230	1334
CASTELL MALGWYN 22	**6	**24	*33	*6	100	440					0	0	**5	**35	*5	*17	230	1012
CASTELL MALGWYN 23	**3	*20	*16	*3	50	220	**6	*65	*5	*3	242	1065	**2	*65	*2	*6	86	378
CASTELL MALGWYN 24	**6	**24	*33	*6	100	450	**6	**13	*5	*3	250	1125	**5	**35	*5	*17	230	1035
CASTELL MALGWYN 25	**6	**24	*33	*6	100	360	**6	**13	*5	*3	250	900	**5	**35	*5	*17	230	828
CASTELL MALGWYN 26	**3	*20	**13	*3	50	140					0	0	**2	*65	**0	*6	86	241
CASTELL MALGWYN 27	**3	*20	**13	*3	50	140					0	0	**2	*65	**0	*6	86	241
CASTELL MALGWYN 28	**3	*20	**13	*3	50	115	**6	*65	**1	*3	242	556	**2	*65	**0	*6	86	198
CM 3169	**6	**24	**26	*6	100	280	**6	**13	**1	*3	250	700	**5	**35	**1	*17	230	644
CM 0438	**6	**24	**26	*6	100	510	**6	**13	**1	*3	250	1275	**5	**35	**1	*17	230	1173
CM 0165	**6	**24	**26	*6	100	410	**6	**13	**1	*3	250	1025	**5	**35	**1	*17	230	943
TOTAL						**4215**						**9521**						**9338**

	Dwr Cymru Welsh Water Bryngwyn WTW - liquid water clarification sludge						Dwr Cymru Welsh Water Capel Dewi WTW - liquid water clarification sludge						Dwr Cymru Welsh Water Cefn Dryscoed WTW - liquid water clarification sludge					
Field Ref.	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**
CASTELL MALGWYN 1	**4	**13	*5	*5	250	1100	**3	**7	*5	*20	133	585	**7	**13	*5	*4	250	1100
CASTELL MALGWYN 7	**4	**13	*5	*5	250	325	**3	**7	*5	*20	133	173	**7	**13	*5	*4	250	325
CASTELL MALGWYN 19	**4	**13	*5	*5	250	1450	**3	**7	*5	*20	133	771	**7	**13	*5	*4	250	1450
CASTELL MALGWYN 22	**4	**13	*5	*5	250	1100	**3	**7	*5	*20	133	585					0	0
CASTELL MALGWYN 23	**4	*65	*5	*5	244	1074	**3	*35	*5	*20	133	585	**6	*65	*5	*4	243	1069
CASTELL MALGWYN 24	**4	**13	*5	*5	250	1125	**3	**7	*5	*20	133	599	**7	**13	*5	*4	250	1125
CASTELL MALGWYN 25	**4	**13	*5	*5	250	900	**3	**7	*5	*20	133	479	**7	**13	*5	*4	250	900
CASTELL MALGWYN 26	**4	*65	**1	*5	244	683	**3	*35	**1	*20	133	372					0	0
CASTELL MALGWYN 27	**4	*65	**1	*5	244	683	**3	*35	**1	*20	133	372					0	0
CASTELL MALGWYN 28	**4	*65	**1	*5	244	561	**3	*35	**1	*20	133	306	**6	*65	**1	*4	243	559
CM 3169	**4	**13	**1	*5	250	700	**3	**7	**1	*20	133	372	**7	**13	**1	*4	250	700
CM 0438	**4	**13	**1	*5	250	1275	**3	**7	**1	*20	133	678	**7	**13	**1	*4	250	1275
CM 0165	**4	**13	**1	*5	250	1025	**3	**7	**1	*20	133	545	**7	**13	**1	*4	250	1025
TOTAL						**12001**						**6422**						**9528**

	Dwr Cymru Welsh Water Cray WTW - liquid water clarification sludge						Dwr Cymru Welsh Water Hirwaun WTW - liquid water clarification sludge						Dwr Cymru Welsh Water Llechryd WTW - liquid water clarification sludge					
Field Ref.	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**	**N Applied - Waste (kg/ha)**	**P_2O_5 Applied - Waste (kg/ha)**	**K_2O Applied - Waste (kg/ha)**	**MgO Applied - Waste (kg/ha)**	**Application Rate (t/ha)**	**Total Tonnes**
CASTELL MALGWYN 1	**5	**13	*5	*7	250	1100	**7	**13	*5	*12	244	1074	**4	**12	*5	*20	97	427
CASTELL MALGWYN 7	**5	**13	*5	*7	250	325	**7	**13	*5	*12	244	317	**4	**12	*5	*20	97	126
CASTELL MALGWYN 19	**5	**13	*5	*7	250	1450	**7	**13	*5	*12	244	1415	**4	**12	*5	*20	97	563
CASTELL MALGWYN 22	**5	**13	*5	*7	250	1100	**7	**13	*5	*12	244	1074	**4	**12	*5	*20	97	427
CASTELL MALGWYN 23	**5	*65	*5	*7	241	1060	**7	*65	*5	*12	244	1074	**4	*61	*5	*20	97	427
CASTELL MALGWYN 24	**5	**13	*5	*7	250	1125	**7	**13	*5	*12	244	1098	**4	**12	*5	*20	97	437
CASTELL MALGWYN 25	**5	**13	*5	*7	250	900	**7	**13	*5	*12	244	878	**4	**12	*5	*20	97	349
CASTELL MALGWYN 26	**5	*65	**1	*7	241	675	**7	*65	**1	*12	244	683	**4	*61	**1	*20	97	271
CASTELL MALGWYN 27	**5	*65	**1	*7	241	675	**7	*65	**1	*12	244	683	**4	*61	**1	*20	97	271
CASTELL MALGWYN 28	**5	*65	**1	*7	241	554	**7	*65	**1	*12	244	561	**4	*61	**1	*20	97	223
CM 3169	**5	**13	**1	*7	250	700	**7	**13	**1	*12	244	683	**4	**12	**1	*20	97	271
CM 0438	**5	**13	**1	*7	250	1275	**7	**13	**1	*12	244	1244	**4	**12	**1	*20	97	495
CM 0165	**5	**13	**1	*7	250	1025	**7	**13	**1	*12	244	1000	**4	**12	**1	*20	97	398
TOTAL						**11964**						**11784**						**4685**

* Total nutrient content of waste used on P, K or Mg index 2 or above

** Available nutrient content of waste used on P, K or Mg index 0 or 1

The assumed availability of total nutrients in the Volac/Sensient (Arla) liquid sludge are N 20%, P_2O_5 60%, K_2O 80%, MgO 10%, SO_3 20%

The assumed availability of total nutrients in the DCWW water clarification sludges are N 10%, P_2O_5 20%, K_2O 20%, MgO 20%, SO_3 10%

Potential negative impacts from this application and mitigation measures planned:

Waste composition & receiving soils

- Potentially Toxic Elements: The supplied concentrations at the proposed application rates are all lower than the maximum permissible levels detailed in the Sludge (Use in Agriculture) Regulations for biosolids applied to agricultural land, which is believed to be a suitable comparison for wastes applied to agricultural land.
- Physical contaminants: The wastes are produced by managed processes. The wastes do not contain physical contaminants.
- The pH of the receiving soils ranges from pH 5.6 to 6.6.
- Dwr Cymru Welsh Water Bontgoch, Bryngwyn, Capel Dewi, Cray, Hirwaun & Llechryd water treatment works use iron-based coagulants to condition the water. Liquid sludge from these sites will only be spread on fields with a soil pH of 5.5 or above. All fields have a soil pH above 5.5.
- Dwr Cymru Welsh Water Cefn Dryscoed & Strata Florida water treatment works uses aluminium-based coagulants to condition the water. Liquid sludge from this site will only be spread on fields with a soil pH of 6.0 or above. No DCWW Cefn Dryscoed or Strata Florida liquid water clarification sludge will be spread on fields Castell Malgwyn 22, 26 or 27 as the soil pH for these fields is below pH 6.0.
- BOD: The BOD of the Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) - sludge from on-site effluent treatment is 903 mg/l and is significantly less than the range for cattle slurry (10-20,000 mg/l). Consequently, the environmental risks applying this sludge will be less than that of the material mentioned and more similar to 'dirty water' (1000-2000 mg/l). Consequently, the environmental risks applying the waste will be similar to that of the material mentioned. To mitigate the pollution risk to watercourses the sludge will not be applied at a rate greater than 50 t/ha in a single application. The proposed method of application, no-spread zones and precautions as stated in this document should be sufficient to minimise the pollution risk to manageable levels.
- Soils have been sampled to 7.5cm depth for permanent grass fields with a 'half cheese' corer soil sampler walking a 'W' pattern across each field collecting approx. 25 sub samples per field.
- Receiving soils have been analysed and are suitable for application at the proposed application rates.
- A number of the fields have a soil magnesium index of 3, or 4. The total magnesium applied by the wastes is no more than 20kg/ha which is similar to what is likely to be removed by the next crop so there is unlikely to be an increase to soil magnesium levels. The amount of magnesium being applied is unlikely to have any noticeable difference on soil structure and the fields are permanent grass cropping.
- Grass is not responsive to magnesium however herbage levels should be maintained to prevent 'Grass Staggers' in lactating animals. Potassium applications can reduce magnesium uptake resulting in 'Staggers'. The receiving soils have a magnesium index of 2, 3, or 4 and so the risk is low.
- On the other hand, high magnesium soils can reduce potassium availability. Application of liquid sludges at the proposed application rates with some potassium also being applied in the sludges (plus the balance of crop requirements for potassium applied as manufactured fertiliser by the farmer) is unlikely to reduce potassium availability which can be seen in soils where the magnesium index is 5 or above.

Operations

The fields in this deployment have been designated as 'high risk' following site checks on the proximity to surrounding protected areas (e.g. SSSIs) and groundwater source protection zones with some fields within 500m of the Afon Teifi SSSI, Coedydd a Corsydd Aber Teifi (Teifi Estuary Woodlands and Marshes) SSSI, Afon Teifi / River Teifi SAC & Coedmor NNR. On the basis of 'high risk' the proposed operation will be subject to a site-specific risk assessment for deploying mobile plant under a SR2010 No.4. The potential risks associated with the application of waste on this deployment have been identified as;

- Potential run-off after application: The wastes will be applied following the Code of Good Agricultural Practice. The maximum application rate for each field over 50t/ha will be split into multiple applications and will not exceed 50t/ha in any one application to a field. The fields will be spread using precision spreading dribble bar equipment with no spreading areas enforced as per maps.
- All handling of the wastes will be in accordance to current regulations and relevant mitigation strategies will be adopted.
- Odour may potentially be emitted from the spreading of the Volac/Sensient (Arla) liquid sludge – to mitigate odour generation all handling of waste will be done in accordance to current regulations and relevant mitigation strategies will be adopted. Liquid sludge will be spread with low trajectory dribble bar applicator. This is an efficient method to prevent odour transmission & nutrient losses associated with higher trajectory spread methods such as splash plate. If any odour complaints are received, further odour mitigation methods will be implemented.
- The Dwr Cymru Welsh Water liquid water clarification sludges are considered to have no noticeable odour.
- Spillages: all spillages will be reported immediately to NRW.
- No waste will be spread within 10m of any ditch, pond or surface water, within 50m of any spring, well, borehole, or reservoir that supplies water for human consumption or farm dairies.
- The liquid sludges will be spread on delivery or temporarily securely stored as stated above. Operators will aim to empty spreading equipment before the end of each working day to avoid overnight storage of waste in machinery.
- Regular servicing of all machinery is conducted and spreading equipment is annually calibrated. To prevent waste being held in faulty machinery replacement spreading equipment will be available.
- Spreading machinery will travel over the field in a direction which will most easily allow the machinery to turn within the boundaries of the field. Any spreading equipment will be turned off prior to turning at the end of each run.
- Machinery turns will be routed to avoid rutting and wheel slip. The turns will not be executed on any buffer strips.
- There will be sufficient trained staff available to ensure that the operation continues throughout operational hours (i.e. there will be sufficient cover for illness, holiday etc.).
- Rights of way have been marked on the spread risk maps. There are public footpaths in fields CASTELL MALGWYN 19, 23 & 25.
- Weather conditions will be monitored prior to spreading with wind speed and direction assessed.
- Consideration for the public and local residential receptors will be taken into account.

Signed: Robert Tucker	**Date:** 26/08/2026