

Statement of Agricultural Benefit

– Bettel Farm & Pencefen Farm



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 addresses:

Bettel Farm, Ferwig, Cardigan, Ceredigion, SA43 1QB

Pencefen Farm, Mwnt, Cardigan, Ceredigion, SA43 1QB

Wastes to be applied:

Waste Code	Waste Description	Physical Form	Waste Producer
02 05 02	Waste from the dairy products industry – sludge from on-site effluent treatment	Liquid	Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) *

* 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:

- Fields Bettel 5511 & 9114 will be spread with one application of liquid sludge in March – June 2027 prior to cultivations and the forage maize crops being planted. The liquid sludge will be incorporated into the soil.
- Field Bettel 4613 will be spread with one application of liquid sludge into the growing winter wheat crop in March – May 2027.
- Field Bettel 7599 may be spread with one application of liquid sludge in July – September 2026 prior to cultivations and grass establishment. The liquid sludge will be incorporated into the soil. The field may then be spread again in February – June 2027 prior to first cut of silage or following silage cuts. Spreading of this field may be split into up to 3 applications & the total of all applications will not exceed the max application rate for each field as listed in table 1. Each individual application will not exceed 50t/ha in any one application to a field.
- Fields Bettel 1314, 3022, 4630 & 7613 will be spread in February – April 2027 prior to first cut silage and again following first or second cut of silage May – June 2027. Spreading of these fields may be split into up to 3 applications & the total of all applications will not exceed the max application rate for each field as listed in table 1. Each individual application will not exceed 50t/ha in any one application to a field.
- Fields Pencefen 1 & 9 will be spread with one application of liquid sludge prior to cultivations and planting of the fodder beet crops in March – May 2027. The waste will be soil incorporated as soon as possible and within 12 hours prior to cultivations and planting of the fodder beet crops.
- Fields Pencefen 2, 6, 7 & 8 will be spread in February – April 2027 prior to first cut silage and again following first or second cut of silage May – June 2027. Spreading of these fields may be split into up to 3 applications & the total of all applications will not exceed the max application rate for each field as listed in table 1. Each individual application will not exceed 50t/ha in any one application to a field.
- The grass fields aren't to be cut or grazed for at least 3 weeks following application.
- 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.
- 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.

Application (continued):

- The liquid sludge is delivered by HGV road tankers which are discharged into temporary storage nurse tanks, or pumped via lay flat hose from a nurse tank to the self-supporting slurry bag for temporary storage for the Bettel Farm fields prior to spreading. The nurse tanks and slurry bag will be completely empty before use and only used to store waste under this deployment. Spreading 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.
- The Labaronne Citaf self-supporting slurry bag is for temporary storage and is purpose built, sealed, can be vented and has designated fill and empty valves and is sited on a suitable flat area within a soil bund. 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 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 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.
- Liquid sludge may be temporarily stored in the slurry bag for future application when conditions are suitable and there's requirement. Should the ground or weather conditions mean it's unsuitable for spreading then temporary storage in nurse tanks may also be required. These potential locations are detailed on the attached field maps & within the LPD1 form.

Benefits from waste application:

- The analysis and nutrient content of the waste is shown in the waste analysis attachments.
- The waste is a source of nitrogen, phosphate, potassium, sulphur, sodium and calcium. The waste 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 25-120kg SO₃/ha. The amount of available sulphur supplied by the wastes at the proposed maximum application rates is 1kg SO₃/ha.
- The addition of sodium will improve the palatability of grass and is important in the diet for livestock health.
- The recommended maximum application rates are shown in Table 1 and have been made on a field by field basis using The Nutrient Management Guide (RB209).

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:

Rates of application (t/ha)	Nitrogen kg/ha		Phosphate (P ₂ O ₅) kg/ha		Potash (K ₂ O) 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 @ 65 t/ha	20	4	26	16	21	17	4	0	7	1
Estimated Availability	20%		60%		80%		10%		20%	

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

Field Ref.	Soil Type	Spreadable Area (ha)	Previous Crop	Next Crop	Nitrogen		Phosphate			Potash			Magnesium	
					SNS	N Required (kg/ha)	P Index	P ₂ O ₅ Required (kg/ha)	Crop Use (Offtake) (kg/ha)	K Index	K ₂ O Required (kg/ha)	Crop Use (Offtake) (kg/ha)	Mg Index	MgO Required (kg/ha)
Bettel Farm														
Bettel 7599	Medium soils	4.95	Winter barley	Grass 3 cuts silage	Moderate	250	3	20	80	0	370	282	2	0
Bettel 5511	Medium soils	2.90	Forage maize	Forage maize	1	100	3	20	63	2+	167	198	2	0
Bettel 9114	Medium soils	3.85	Forage maize	Forage maize	1	100	3	20	63	1	227	198	3	0
Bettel 1314	Medium soils	4.50	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	3	20	80	2-	280	282	2	0
Bettel 3022	Medium soils	3.95	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	3	20	80	1	320	282	2	0
Bettel 4630	Medium soils	3.45	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	2	80	80	1	320	282	3	0
Bettel 4613	Medium soils	3.00	Forage maize	Winter wheat	1	220	3	0	56	0	145	84	3	0
Bettel 7613	Medium soils	6.30	Grass 3 cuts silage	Grass 3 cuts silage	Moderate	250	3	20	80	2+	190	282	2	0
Pencefen Farm														
Pencefen 1	Medium soils	3.80	Fodder beet	Fodder beet	1	120	3	0	60	2-	340	340	3	0
Pencefen 2	Medium soils	3.30	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	2	65	65	3	70	228	2	0
Pencefen 6	Medium soils	1.40	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	2	65	65	2+	180	228	3	0
Pencefen 7	Medium soils	1.70	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	3	20	65	3	70	228	3	0
Pencefen 8	Medium soils	2.00	Grass 2 cuts silage + grazing	Grass 2 cuts silage + grazing	Moderate	205	2	65	65	3	70	228	2	0
Pencefen 9	Medium soils	1.80	Fodder beet	Fodder beet	1	120	3	0	60	2+	310	340	2	0
TOTAL		46.90												

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
Grass 3 cuts silage (23t FW/ha at 1st cut, 15t FW/ha at 2nd cut, 9t FW/ha at 3rd cut), silage 25% DM, totalling 1.7kg/t P2O5 and 6.0kg/t K2O removed in offtake
Expected DM yields of grass 9-12t/ha, good grass growth class
Forage maize 45t FW/ha silage (30% DM)
Fodder beet (85t/ha roots lifted)
Winter wheat 8t/ha straw removed

	Volac/Sensient, Felinfach: EPR/BP3135EB effluent treatment plant (Arla Food Ingredients, Felinfach) - sludge from on site effluent treatment					
Field Ref.	N Applied - Waste (kg/ha)	P ₂ O ₅ Applied - Waste (kg/ha)	K ₂ O Applied - Waste (kg/ha)	MgO Applied - Waste (kg/ha)	Application Rate (t/ha)	Total Tonnes
Bettel Farm						
Bettel 7599	**4	*26	**17	*4	65	322
Bettel 5511	**3	*20	*16	*3	50	145
Bettel 9114	**3	*20	**13	*3	50	192
Bettel 1314	**4	*26	*21	*4	65	292
Bettel 3022	**4	*26	**17	*4	65	257
Bettel 4630	**4	*26	**17	*4	65	224
Bettel 4613	**3	*20	**13	*3	50	150
Bettel 7613	**4	*26	*21	*4	65	410
Pencefen Farm						
Pencefen 1	**3	*20	*16	*3	50	190
Pencefen 2	**3	*20	*16	*3	50	165
Pencefen 6	**3	*20	*16	*3	50	70
Pencefen 7	**3	*20	*16	*3	50	85
Pencefen 8	**3	*20	*16	*3	50	100
Pencefen 9	**3	*20	*16	*3	50	90
TOTAL						2692

* 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 waste are N 20%, P₂O₅ 60%, K₂O 80%, MgO 10%, SO₃ 20%

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 significantly 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 waste is produced by managed processes. The waste does not contain physical contaminants.
- Waste pH: The waste pH is close to neutral and application is unlikely to have any significant effect on soil pH.
- The pH of the receiving soils ranges from pH 5.7 to 6.7.
- BOD: The BOD of the liquid sludge 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). 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 & to 15cm depth for arable & temporary 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.
- Some fields have a soil magnesium index of 3. The magnesium applied by the waste is less than what is likely to be removed by the next crops so there should be no increase to soil magnesium levels. The amount of magnesium being applied is unlikely to have any noticeable difference. The liquid sludge also applies calcium which will help soil aggregation and structure.
- 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'.
- On the other hand, high magnesium soils can reduce potassium availability. Application of liquid sludge at the proposed application rates with little magnesium being applied and potassium also being applied in the waste (plus the balance of crop requirements for potassium applied as manufactured fertiliser by the farmer) is unlikely to reduce potassium availability.
- Several fields have a soil phosphate index of 3 based on soil analysis undertaken which is above target P index of 2 for grassland & arable soils. Application rates for the fields are only applying 20-26 kg/ha of total phosphate for the next crops for these fields so there will be rundown of phosphate in the soil through crop offtake. The liquid sludge is providing many benefits through application of other nutrients and trace elements. The soil phosphate levels of these fields will be monitored by the farms through regular soil analysis with the aim to run down the phosphate in the soil to target P index 2 over a number of years should future soil analysis indicate the fields are still above target P index 2 and run down is required.

Operations

The fields in this deployment have been designated as 'medium risk' following site checks on the proximity to surrounding protected areas (e.g. SSSIs) and groundwater source protection zones. On the basis of 'medium risk' the proposed operation will be subject to the generic 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 waste will be applied following the Code of Good Agricultural Practice. The maximum application rate for each field where over 50t/ha will be split into multiple applications (up to 3 separate 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. The arable fields will be cultivated within 12 hours following spreading with the sludge incorporated into the soil prior to the planting of the next crops.
- All handling of the waste will be in accordance to current regulations and relevant mitigation strategies will be adopted.
- Odour may potentially be emitted from the spreading of the waste – to mitigate odour generation all handling of waste will be done in accordance to current regulations and relevant mitigation strategies will be adopted. Waste 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.
- 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.
- Waste will be spread on delivery (or 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 with public footpaths in fields Pencefen 1, 7 & 9.
- 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: 25/06/2026