

1. Appropriate Technical Expertise

- This agricultural benefit statement has been prepared by Ryan Griffiths-Patel of Trade Effluent Services Ltd.
- Relevant Qualifications & Experience
 - Msc Environmental Informatics
 - Bsc Geography
 - 1 Year's experience in deployment applications

2. Location of Activity

- It is proposed to spread up to 8 commercial wastes at Brick Kiln Farm. These can be seen in the site plan at appendix A. The locations for Tremeirchion, Denbighshire, Wales, CH7 5BL, United Kingdom The main address for the spreading operation is at Brick Kiln Farm. The total area of land is 6.4 hectares.
- This deployment application is for the application of 8 wastes to number of 2 fields in total - field sizes and OS National Grid references are shown in Table 1 below. A site plan is shown in Appendix A.

Field	Size (ha)		Grid Reference
Rhualt 2	4.4		SJ 08498 74772
Rhualt 4	2		SJ 08475 74974
Commercial Waste Storage Tank	Quantity Stored at any one time (Tonnes)	Grid Reference	Farm Name
Tank 1	120	SJ 10596 75122	Brick Kiln Farm
Tank 2	120	SJ 08912 74947	Brick Kiln Farm

Table 1 – Spreadable area and OSGR

- All fields to be spread are **within** an NVZ designated area, and spreading will comply with NVZ regulations. Nitrogen applications for land within a designated NVZ is 170 kg/ha/yr on a whole farm basis and 250kg/ha/yr on a field basis.

- When spreading equipment is on site, waste will be delivered into mobile storage tanks each with a capacity of approximately 30m³. Storage tank locations are illustrated on the site plan shown in Appendix A. No more than 120m³ will be stored in mobile storage tanks on site at the following locations (see table 1). These mobile storage tanks will only be used for temporary waste storage when it is suitable to spread.

3. Soils

- The soils were sampled in September 2020 in accordance with the sampling procedures described in Section 1 of the RB209 (9th Edition). Analysis was carried out by NRM Ltd for pH, major plant nutrients, and potentially toxic elements (PTES) described in the Sludge (Use in Agriculture) Regulations.
- The NRM Ltd report is attached to Appendix B and summarised in Table 6.
- Soils were typically found to be loamy sand and are categorised in accordance with RB209 (9th edition) as mineral soils for crop recommendations.

-The soil pH ranges from 6.2 to 5.3 ,although it shouldn't affect crop performance.

- Soil P index ranges from 1 to 3 and the soils are generally above at or above the guideline target index of 2. Where the index is 3 and above the nutrient applications will be limited to no more than crop offtake in the current rotation to ensure that there is increase no in soil P index.
- Soil potassium levels ranged from index 0 to 2- indicating the soil is satisfactory.
- The magnesium levels for all fields was satisfactory.
- PTE concentrations for all fields is low and within the typical range of uncontaminated soil.
- The soils proposed to be spread are suitable to receive an application of sludge as detailed within this application.

4. Waste To Be Spread

- It is proposed to spread up to 8 wastes to the land. The waste generally arises from food/beverage manufacturers and is primarily sludge from on-site effluent treatment plants and materials unsuitable for consumption and processing.
- A summary of the waste description and EWC code is show in Table 2.

Waste Producer	EWC Code	Waste Description	Total Amount being spread(Tonnes)
Secanim	02 02 04	Sludges from on-site ETP from abattoirs, poultry preparation plants, rendering plants or fish preparation plants only	352
English Provender	02 03 01	Sludge from washing, cleaning, peeling, centrifuging and separation	492.8
Croda Goole (Forward Environmental)	07 07 12	Sludges from on-site biological effluent treatment plant at chemical manufacturing sites other than those mentioned in 07 01 11 only	262.4
Maelor Foods	02 02 04	Sludges from on-site ETP from abattoirs, poultry preparation plants, rendering plants or fish preparation plants only	179.2
Encirc	02 07 05	Sludge from ETP	140.8
Beechdean Ice cream	02 05 01	Biodegradable materials unsuitable for consumption or processing	1600
Kelloggs	02 03 05	Sludges from on-site ETP	800
Highbury Poultry	02 02 04	Sludges from on-site ETP from abattoirs, poultry preparation plants, rendering plants or fish preparation plants only	128
Total Hectares	6.4	Max Tonnage	1600

Table 2 – Waste description

- To avoid the need for multiple deployments in a situation such as this when a range of wastes are available, it is necessary to include them all to accommodate such variables as the amount of material produced by the waste producer and timing of application (before seedbed preparation). Wastes will be applied on an individual basis and applications will be carefully managed and monitored to ensure that nutrients are applied at or below crop requirement/offtake values as described in this agricultural benefit statement. .
- As this is a multiple waste stream application, each waste is able to convey a benefit in its own right. Application rates are established for each waste when applied in isolation. When wastes are applied as a mix, the waste with the highest nutrient, PTE or other limiting factor is used as the maximum application rate (i.e. waste will be spread at the lowest application rate).

- The waste will be applied before seedbed preparation for arable fields and while the leaf is short or after cuts of silage for grass field and as a split. The waste is anticipated to be spread at the start of June 2021 for grass fields, although this may change due to weather conditions and farmer requirements.
- Sludge has been analysed by NRM Ltd for major plant nutrients, including nitrogen, phosphate and potash and will provide agricultural benefit through the addition of these nutrients to the receiving soil.
- Waste will be delivered to site by road tanker and off loaded into mobile storage tanks each with a capacity of approximately 30m³. Waste will be spread individually up to the individual application rate via the appropriate method of application.
- The wastes will provide nutrients for the crop as described in the waste evaluation forms however this may be subject to change determined by analysis of individual samples during the agreed 12 month deployment period. The sludge is regularly analysed and application rates will be adjusted according to changes in analysis and volumes arising. If application rates are adjusted then nutrient loadings will not exceed either crop requirement or NVZ regulations. An assessment on spreading rate and nutrient addition will be made on each field. It should be noted that the waste Maelor Foods contains highly available (36%) nitrogen, and thus will not be spread during NVZ closed periods.
- Due to the coding of the Secanim and Maelor Foods and Highbury Poultry waste streams (02 02 04), a visual inspection was made to determine if analysis for FOGs was required. It was deemed not necessary yet has been undertaken and provided in the waste analysis. The wastes will be closely monitored during the spreading of this site, and so the requirement for FOGs analysis will be reviewed periodically. The Secanim waste is not expected to contain Selenium, Arsenic, Molybdenum and Fluoride, and so has not been tested for such elements. There will also be a interval of least three weeks between the application of wastes with the EWC's 02 02 04 and 07 07 12 any using the grass for grazing or cutting.
- If it is necessary to mix wastes prior to application (for example during storage during adverse weather) wastes will be applied at the lowest individual application rate.

5. Previous Nutrients Applied

- There has been a application of FYM in 2019 - details are shown in Table 3.
- Nutrients applied in the previous application have been taken into account when calculating crop requirement.

Field	Waste Applied	Application Rate (t/ha)	Nitrogen		Phosphate		Potash	
			Total	Available	Total	Available	Total	Available
Rhualt 2								

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Deployment Application – REF – FARM NAME

Appendix E – Benefit Statement

Rhuallt 4								

Table 3 – Previous nutrients applied**6. Agricultural Benefit Of Waste Application**

- The sludge will be used to provide plant nutrients which will replace a proportion of the fertiliser that the farmer would normally apply to their crop. Essential plant nutrients will be applied up to crop requirements or crop off take values where the soil nutrient index is above target values. The waste will also provide benefit through the addition of organic matter and trace elements. Crop fertiliser requirements are based on figures from the RB209 (9th Edition). Individual waste evaluations are attached in Appendix C.
- Table 4 shows the crop fertiliser requirement for the fields based on the proposed crop rotation and soil analysis.

Field	Size (ha)	Grid Reference	Soil Type	Current Crop	Next Crop	Expected Yield (t/ha)	Nitrogen kg/ha	Phosphate kg/ha	Potash kg/ha
Rhualt 2	4.4	SJ 08498 74772	Loamy Sand	2nd cut silage and grazing	2nd cut silage and grazing	38	210	65	170
Rhualt 4	2	SJ 08475 74974	Loamy Sand	2nd cut silage and grazing	2nd cut silage and grazing	38	210	95	170

Table 4 Fertiliser Requirements (*Crop offtake figures)

- It is intended to spread the wastes by sub-soil injection to reduce the risk of environmental incidents (run off, odour nuisance issues), to minimise dis-benefit to the growing crop (leaf scorch, smothering) and to provide nutrients to the root zone. Typically wastes will be applied by deep leg injector however a shallow injector n may be used dependant on soil/weather conditions at the time of application. In drought conditions, wastes with low odour potential and low risk of smothering crop leaf may be surface applied and will provide additional benefit through irrigation. Table 4 shows the crop fertiliser requirement for the fields based on the proposed crop rotation. The application of sludge will also provide small increases in soil organic matter, which can help improve soil structure and water and nutrient holding capacity.
- Assessment of the waste is attached in table 5.

Commercial Waste	Application Rate t/ha	pH	Nitrogen kg/ha		Phosphorous kg/ha		Potassium kg/ha		Magnesium kg/ha
			Total	Available (30%)	Total	Available (50%)	Total	Available (90%)	Total
Secanim	55	7.16	248	74	21	10	13	12	8
English Provender	77	6.76	92	28	45	23	4	3	2
Croda Goole (Forward Environmental)	41	7.55	74	22	45	22	7	6	7
Maelor Foods	28	6.65	95	29	45	22	6	5	10
Encirc	22	5.88	162	48	45	22	14	13	5
Beechdean Ice cream	250	5.96	75	23	33	17	28	25	6
Kelloggs	125	7.71	25	8	6	3	8	7	44
Highbury Poultry	20	6.25	176	53	44	22	10	9	4

Table 5 – Application rate and nutrient input

Nitrogen

- The analysis showed that the nitrate and ammoniacal nitrogen in the majority of wastes are relatively low indicating low immediate availability of nitrogen. The remaining total nitrogen applied will become available to the crop through mineralisation throughout following seasons as is typical from organic manures and biosolids..
- The rate of nitrogen release will be affected by several factors including soil type, climate, and timing and method of application.

Phosphorus

- Applications of wastes are limited to ensure that phosphate is applied at or below crop off take values as calculated from the RB209 ensuring that the spreading activities do not increase soil P reserves.

Potash

- The waste applied will supply up to 29kg/ha potash which will not meet crop offtake for all fields however will allow the landowner to significantly reduce the amount of chemical fertiliser required to meet the crop need.

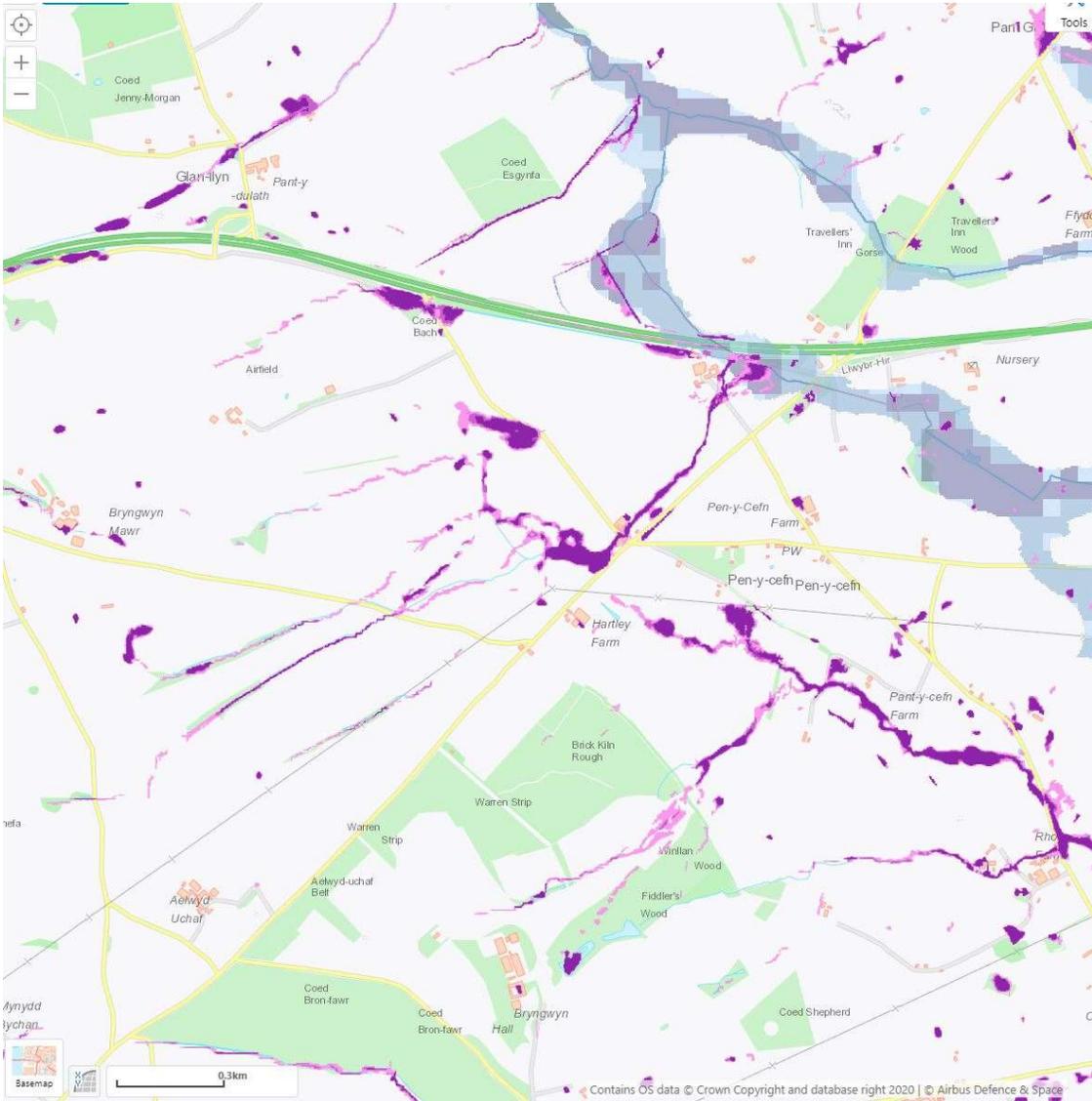
- The applications of wastes at the proposed application rates will provide nutrients at or below crop requirement or offtake values and will not result in an increase in soil nutrient reserves.

Organic Matter

The application of sludge will also provide a small increase in soil organic matter, which can help to improve soil structure and water & nutrient holding capacity.

7. Pollution Risk Assessment

- There are a number of properties within 500m of the fields proposed to be spread. The sludges have the potential to cause odour however storage tanks will be sited away from dwellings and application of sludge via an umbilical cord sub soil injection system will minimise the risk of odour associated with landspreading and the operation is unlikely to cause nuisance odour issues. Operations will be carried out in accordance with normal agricultural hours to further reduce the risk of odour complaints and the overall risk of odour is low. An odour management plan has been included with this application.
- Waste will be stored on site in mobile holding tanks each with a capacity of approximately 30m³ prior to spreading. Storage tanks are inspected daily by the operator and wherever possible left empty at the end of the working day. Storage tanks will not be sited within 10m of watercourses – or at the top of a steep embankment. Signage on the tanks identifies the company and activity and has emergency contact details. Anticipated location of storage tanks are shown on the attached plan (Appendix A), however locations may vary slightly due to unforeseen operational requirements.
- Hazards have been identified on the site plan shown in Appendix A and relevant control measures and buffer zones have been identified. Operations are to be carried out in accordance with the company generic risk assessment for landspreading.
- There is a footpath/track alongside several fields however these have a appropriate buffer zone in place.
- There are several watercourses at the site which have been identified on the site plan. In order to protect the watercourses, a 10m buffer zone will be observed adjacent to all watercourses and are highlighted on the attached plan.
- No boreholes. Several wells have been identified within the spreading area. The spreading zone has been reduced to account for the buffer zone in place for wells which is 50m. A spring has identified but it is not within in 50m of the spreading area so no action is necessary.
- The site is within 500m of a statutory designated environmentally sensitive area as defined by Magic.go.uk. This is the SSSI called MWYNGLODDFA PENNANT. A risk assessment has been prepared for both these SSSI. The fields do not have the a buffer zone as the fields are well over 300m away from the SSSI. However a risk assessment is included.
- The flood risk maps show that part of the land to be spread is not within flood prone areas and the land is not within a groundwater source protection zone. The sludge will be spread in appropriate conditions with weather and field conditions constantly monitored.



8. Contingency Planning

- In the event of machinery breakdown or failure, mobile mechanics are available to attend sites and replacement vehicles and equipment are available or can be hired from current suppliers.
- There are sufficient trained staff to maintain general sickness and holiday cover.
- During prolonged periods of adverse weather, planned spreading may be postponed or cancelled. An extensive land bank throughout North West/North Wales allows vehicles to be re-routed if conditions become unsuitable for spreading.

Supporting documents

Appendix A – Site Plan

Appendix B – Soil Analysis

Appendix C – Waste Evaluation

Appendix D – Table 6

Appendix E – Benefit Statement

Appendix F- SSSI Risk assessment

Field	Soil pH	Phosphate		Potash		Magnesium		SNS
	pH	mg/l	Index	mg/l	Index	mg/l	Index	Index
Rhualt 2	5.3	16.4	2	133	2-	102	3	Moderate
Rhualt 4	5.9	15	1	132	2-	134	3	Moderate

Table 6 Table to show the soil quality of the fields to be spread

