Agricultural Benefit Statement

Report Index

1. Permit Details and Appropriate Technical Expertise

The following benefit statement has been written by Richard Street on behalf of Agrispread Ltd. (permit no. FB3606GC/A001).

Relevant Qualifications & Experience include:

- FACTs Qualified – Basis registration no. R/FE/5689
- 7 Years' experience of waste to land recycling operations
- Land spreading of non-farm wastes course (3 day course – May 2010)
- BSc. (Hons) Environmental Management (University of Central Lancashire)

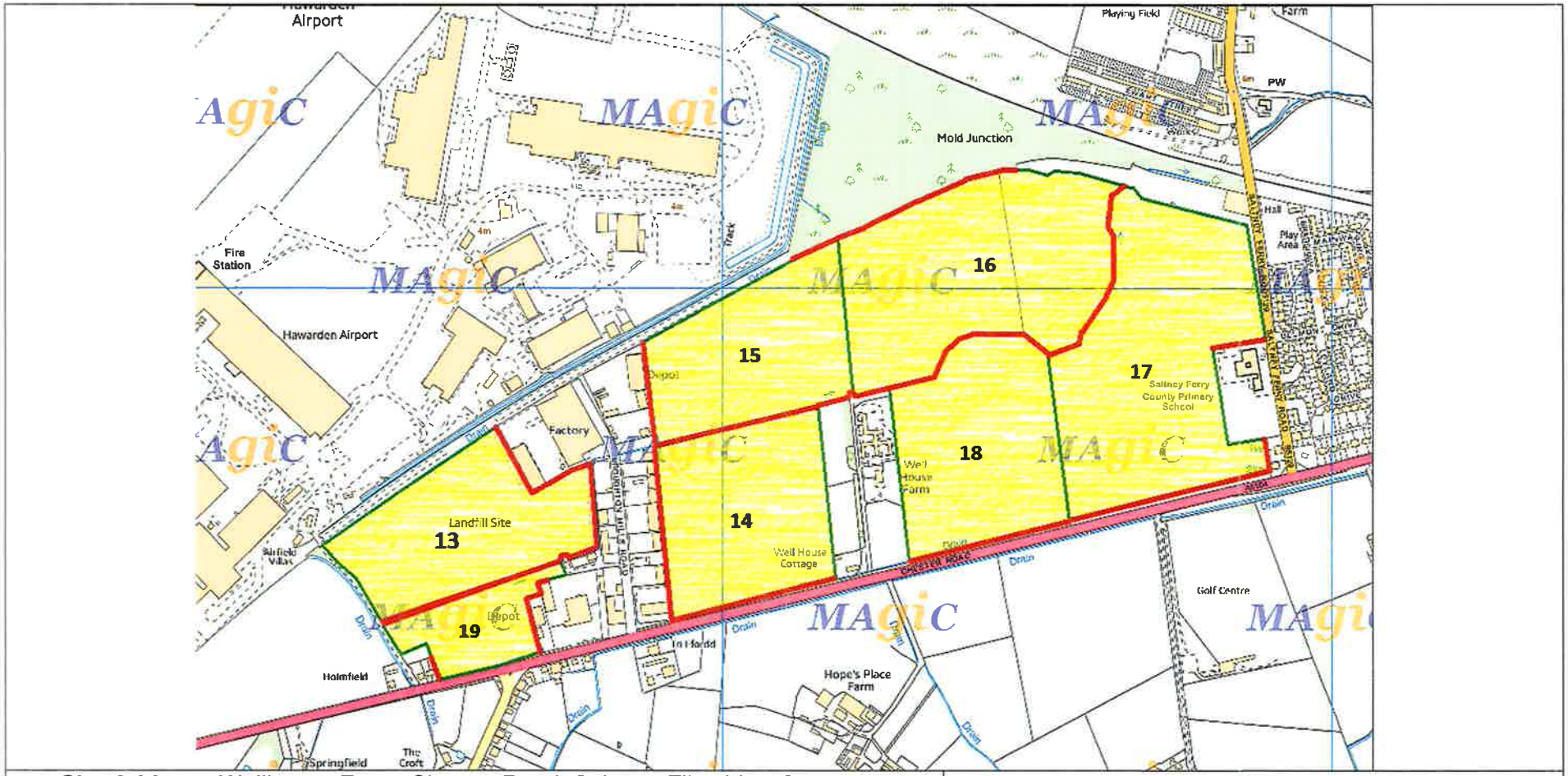
2. Land Details

The following benefit statement proposes to spread Ahlstrom Black Liquor to land. The land details are listed in Table 1, and the site map can be found in Figure 1.

Table 1: Farm and Land Details

Farm Name	Wellhouse Farm
Farm Address and Postcode	Chester Road, Saltney, Flintshire, CH4 0DH
Total Area to be Spread (hectares)	50.0

The waste will be spread directly to fields as there is no suitable storage at the land. Details of the operation are discussed in Section 4.



Site Address: Wellhouse Farm, Chester Road, Saltney, Flintshire, CH4 0DH
Landowner: Mr John Handley

Environmental Risks:
Watercourses bordering all fields - 10m buffer zone from all watercourses and ponds
Properties bordering fields 13-15, 17 & 19 – 10m buffer zone
Grassland/woodland bordering fields 14-16 – 10m buffer zone

Key
Boundary –
No Spread Zone –
Watercourse/ditch –
Transfer Tank / Storage Lagoon - T
Pond –
Footpath –
SSSI/SPA/SAC-

Figure 1: Site map including the fields to spread, receptors, storage (T), and spreading control measures

3. Waste Details

The waste details of Ahlstrom Black Liquor are displayed in Table 2.

Table 2: Waste Details

Waste Producer	Ahlstrom Chirnside Limited
Address of Waste Producer	Mt Sion Works, Mount Sion Rd, Radcliffe, Manchester, M26 3SB
EWC Code	03 03 11
Waste Description	Produced as a by-product of cellulose fibre extraction (sludge from on-site ETP other than 03 03 10)

Ahlstrom Black Liquor contains moderate levels of sulphur and potash, and trace levels of magnesium, phosphate and nitrogen. The waste has been analysed by NRM laboratories in August 2017 for nitrogen, phosphorous, potash, PTE's and other analysis such as FOGs and water soluble sulphur, and the waste analysis, and a waste evaluation, is attached in Appendix D.

4. Operational Details

The Ahlstrom will be delivered to the site by road tanker and off-loaded. The black liquor will be surface applied by umbilical supplied tractor mounted spreader bar or splash plate to reduce the risk of compaction across fields caused by the travelling weight, and due to the low application rate. In order to reduce the risk of crop scorch, applications of the liquor may be split, especially if spreading occurs during the summer months.

It is intended to spread Ahlstrom to arable fields before seedbed preparation. For this application, the waste is expected to be applied to all fields in September 2019. However, this may change due to farmer requirements and weather conditions.

5. Fields and Crop Requirement

Ahlstrom will be applied to all fields and so the crop requirements for all fields, as well as the field sizes and grid references, are displayed in Table 3. Fertiliser requirements are based on figures from the RB209 (9th edition). The magnesium recommendation for all fields is 0 kg/ha.

Table 3: Field Details and Crop Requirements (* denotes crop offtake)

Field	Size	Grid Reference	Current Crop	Next Crop	Expected Yield	Nitrogen	Phosphate	Potash
	ha				t/ha	kg/ha	kg/ha	kg/ha
13	6.5	SJ 35564 64604	Wheat	Grass	8	220	***67****	115
14	6.9	SJ 36036 64627	Wheat	Spring Barley	8	220	95	115
15	6.3	SJ 36050 64884	Barley	W Wheat	8	220	***67****	115
16	10.7	SJ 36416 65040	Wheat	W Wheat	8	220	***67****	115
17	10.7	SJ 36670 64875	Wheat	Winter Barley	8	220	***67****	115
18	7.1	SJ 36433 64733	Maize	W Wheat	8	220	***67****	55 (***83****)
19	1.8	SJ 35605 64441	Wheat	Grass	8	220	***67****	85
Total	**50.0**							

6. NVZ Compliance

The site falls outside an NVZ designated area, which is illustrated in Figure 2. The waste does not apply for the closed periods as Ahlstrom contains trace levels of nitrogen. The application rate of Ahlstrom will comply with crop requirement as no more than crop offtake of all nutrients will be applied to fields. In order to aid the landowner or farmer with their recording requirements, a post-notification of nutrients applied will be provided after spreading.

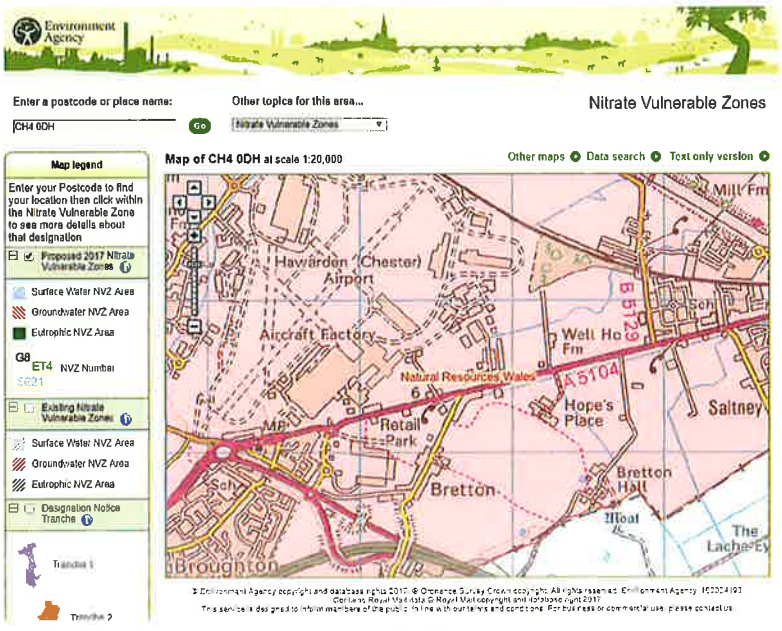


Figure 2: NVZ map for the land to be spread produced from the 'What's in my backyard' mapping service on the EA website (www.environment-agency.gov.uk).

Application rates are limited to a maximum of 250 kg total N/ha, and any other organic waste or manure applications have been accounted for. Previous nutrients applied to the fields within the last 12 months are listed in Table 4. The nutrients in Table 4 are total applied, and the availability of each can be taken from the standard figures in the RB209 (9th edition, section 2).

Table 4: Previous Nutrients Applied

Field	Waste Applied	Month Applied	Application Rate	Nitrogen	Phosphate	Potash
			t/ha	kg/ha	kg/ha	kg/ha
14	Sludge Cake	October 2018	22	187	154	17.6
15	Sludge Cake	October 2018	22	187	154	17.6
16	Sludge Cake	October 2018	22	187	154	17.6
17	Sludge Cake	October 2018	22	187	154	17.6
18	Sludge Cake	October 2018	22	187	154	17.6

7. Benefits of The Operation

The Ahlstrom will be used to provide plant nutrients that will replace a percentage of the fertiliser that the farmer would normally apply to their crop. The waste will primarily be used as an alternative to potash fertiliser. The liquor will also provide benefit through the addition of organic matter and trace elements. A full waste assessment is attached in Appendix D, and a summary of Ahlstrom can be found in Table 5.

Table 5: Summary of Ahlstrom Nutrients and Application Rate

Waste	Application Rate	Nitrogen		Phosphate		Potash	
	t/ha	(total)	(available) 30%	(total)	(available) 50%	(total)	(available) 90%
Ahlstrom	26	10	3	0	0	100	90

Nitrogen

The waste analysis shows that the ammoniacal and nitrate nitrogen in the waste is relatively low; indicating that only a small proportion of nitrogen will be available immediately. The remaining total nitrogen applied will become available to the crop through mineralisation throughout following seasons. The rate of nitrogen release will be affected by several factors including climate, timing and method of application, and soil type.

Phosphorus

Ahlstrom contains trace levels of phosphorus, and at the proposed application rate of 26t/ha will apply trace amounts of phosphate (<1kg/ha). The landowner/farmer should look to reduce the P index, for fields with P indexes of 3 & 4, over the coming seasons.

Potash

The waste applied will not meet the crop requirements for potash for any fields but it will allow the landowner/farmer to considerably reduce the amount of chemical fertiliser required to meet the crop need. The application of Ahlstrom at 26 t/ha will provide nutrients at or below crop requirement or offtake, and will not result in an increase in soil nutrient reserves.

Organic Matter

The Ahlstrom waste will also provide a small increase in soil organic matter. This can help to improve soil structure and water, and nutrient holding capacity.

Soils

Additionally, full soil analysis of the proposed fields to be spread has been attached in Appendix C, and a summary table has been included in Table 6.

Table 6: Summary of soil pH and major nutrients for the fields to be spread

Field	Soil pH	Phosphate		Potash		Magnesium	
		mg/l	Index	mg/l	Index	mg/l	Index
13	7.9	39.0	3	120	1	104	3
14	7.6	14.8	1	75.6	1	69.7	2
15	7.8	36.8	3	102	1	63.7	2
16	7.9	37.2	3	97.9	1	51.2	2
17	7.6	39.6	3	102	1	96.5	2
18	7.8	46.0	4	216	2+	93.7	2
19	8.0	31.4	3	162	2-	71.8	2

The soils were sampled in August 2017 in accordance with the sampling procedures described in the RB209 (9th Edition). Analysis was carried out by NRM laboratories for pH, major plant nutrients, and potentially toxic elements (PTEs) described in the Sludge (Use in Agriculture) Regulations.

Soils were found to be soil type categorised in accordance with RB209 (9th edition) as mineral soils for crop recommendations.

Soil pH ranges from 7.6 and 8.0, and are above the target value, although it shouldn't affect crop performance. Soil P index's range from 1 to 4, and the soils are generally above the guideline target index of 2. Soil K levels ranged from index 1 to 2+ and are generally below the target index level of 2-. The magnesium index for all fields was satisfactory. PTE concentrations for all fields is low and within the typical range of uncontaminated soil.

8. Potential Negative Impacts

There are no known, or expected, elevated levels of PTEs within the Ahlstrom waste. However, the waste does contains high levels of sodium and sulphur, and justification in this regard is explained in this section. Additionally, a report by '*4Recycling*' prepared for '*Northern Disposal Services*' on the '*Assessment of suitable application rates for the recycling of Ahlstrom Black Liquor to agricultural soils*' has been appended in Appendix E, which further details the sulphur and sodium content.

Sulphur

The sulphur will be less likely to leach as it will be bound to the organic matter in the soil as the soil type is medium loam. This is because the majority of the sulphur present is in the form of lignosulphates, which are organically bound to the soil. These are stable compounds that promote soil aggregation and thus have been used as soil conditioners.

The levels of sulphur will be monitored over the coming seasons to ensure that a continued build-up of sulphur will not have a detrimental impact on the environment, and total sulphur and conductivity will be analysed after spreading.

Sodium

The Ahlstrom analysis has an elevated conductivity caused by the presence of soluble salts, in particular sodium. If applied in very dry soil conditions, particularly on light textured soils, this might lead to a risk of temporary scorch.

This will be mitigated by the soil types at this farm which are of medium loams and the high rainfall in this area (<700mm/yr). Previous detailed plant growth trials using this waste have shown that electrical conductivity of the soil will return to normal after a period of 10-12 weeks of application and that conductivity or soil structural instability is unlikely to be an issue when applying this waste at 26t/ha.

Site Hazards

Hazards have been identified on the site plan in Figure 1 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, which will reduce the impacts of the operation on the receiving soil.

Odour and Noise Control

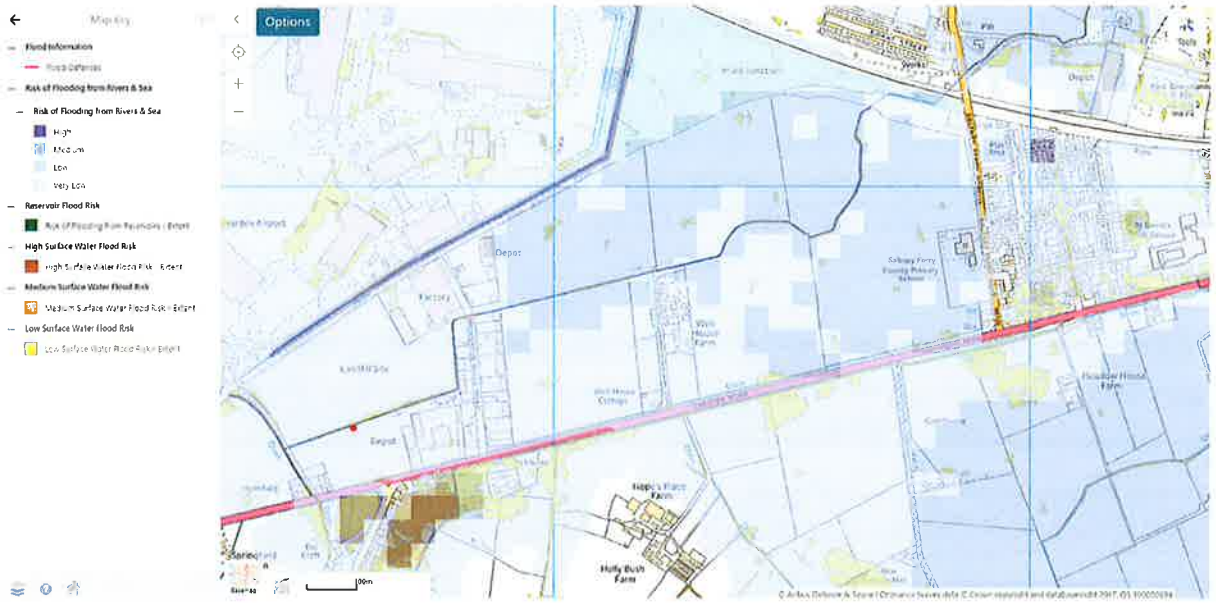
The waste has the potential to cause odour however it is unlikely to cause nuisance odour issues. The operation will be carried out in accordance within normal agricultural hours to minimise the risk of odour and noise complaints.

9. Sensitive Receptors

There are a number of properties within 500m of the fields proposed to be spread. Odour and noise will be controlled, as detailed in section 8, in order to minimise the disruption caused to residents.

There are no footpaths or tracks crossing the fields to be spread, and no boreholes, wells or springs have been identified within the spreading area.

The site is within a flood prone area and the land is within a ground water protection zone 3 (Figure 3). The waste will be spread in appropriate conditions with weather and field conditions continuously examined.



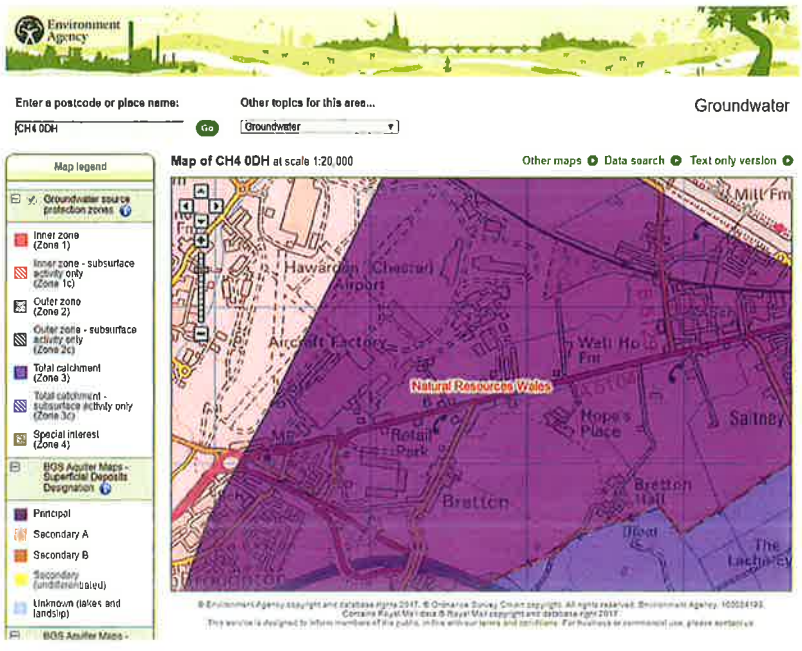


Figure 3: Maps of flood prone areas and ground water protection zones of the land to be spread. These were obtained from the NRW website (naturalresources.wales/evidence-and-data/maps/long-term-flood-risk) and 'What's in my backyard' (www.environment-agency.gov.uk) respectively.

The site is not within 500m of a statutory designated environmentally sensitive area as defined by Magic Maps (magic.gov.uk).

10. Contingency Planning

To cover machinery breakdown, replacement machinery is available or can be hired from suppliers and mobile mechanics are available to attend sites. All machinery is regularly serviced.

There is sufficient trained staff to maintain sickness and holiday cover.

Spreading operations will not be carried out when there are adverse weather conditions that are likely to interfere with the operation. These conditions include; heavy rain, or during periods of heavy snow or frozen ground as defined in the Code of Good Agricultural Practice (COGAP).

Continuing Competence Certificate

This certificate confirms that

Richard George Street

Has met the relevant requirements of the Continuing Competence scheme for the following award(s) which will remain current for two years from 23/01/2019

LS Land Spreading

Expiry Date: 23/01/2021

Verification date: 21/01/2019

Authorised:

WAMITAB Chief Executive Officer

Learner ID: 22940

Certificate No.: 5138263

Date of Issue: 23/01/2019

CIWM Executive Director

The Chartered Institution of Wastes Management

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