



MR ROB PIGGOTT  
TRADE EFFLUENT SERVICES  
HUGMOOR HOUSE  
HUGMOOR  
LLANYPWLL  
WREXHAM LL13 9YE

F990

Please quote above code for all enquiries

ROB MORGAN

SLUDGE

## SLUDGE (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number 41692  
Sample Number 78631

Date Received 31-JAN-2019

Date Reported 06-FEB-2019

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result	Amount per fresh tonne or m3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		4.45			
Oven Dry Solids	%	7.30	73.00	15208	kg DM
Total Nitrogen	% w/w	0.120	1.20	250	kg N
Ammonium Nitrogen	mg/kg	118	0.12	24.58	kg NH4-N
Nitrate Nitrogen	mg/kg	<10	< 0.01		kg NO3-N
Total Phosphorus (P)	mg/kg	17.6	0.04	8.40	kg P2O5
Total Potassium (K)	mg/kg	30.3	0.04	7.57	kg K2O
Total Magnesium (Mg)	mg/kg	<10			kg MgO
Total Sulphur (S)	mg/kg	3844	9.61	2002.05	kg SO3
Total Copper (Cu)	mg/kg	<0.2	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	<0.5	< 0.01		kg Zn
Total Sodium (Na)	mg/kg	10791	14.55	% 3030.42	kg Na2O
Total Calcium (Ca)	mg/kg	10.5	0.01	2.19	kg Ca
Equivalent field application rate		—	1.00	208.33	tonnes or m3 / ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only. Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by Darren Whitbread

Date 06/02/19

**NRM** Coopers Bridge, Braziers Lane, Bracknell, Berkshire RG42 6NS  
**Tel:** +44 (0) 1344 886338 **Fax:** +44 (0) 1344 890972 **Email:** enquiries@nrm.uk.com **www:** nrm.uk.com



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### Laboratory References

Report Number 41692  
Sample Number 78631

Date Received 31-JAN-2019

Date Reported 06-FEB-2019

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result
Total Lead (Pb)	mg/kg	<0.5
Total Cadmium (Cd)	mg/kg	<0.01
Total Mercury (Hg)	mg/kg	<0.05
Total Nickel (Ni)	mg/kg	<0.2
Total Chromium (Cr)	mg/kg	0.210

Released by

*Darren Whitbread*

Date

*06/02/19*

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## How does your sample analysis compare with the 'standard' figures for organic manures?

<b>Farmyard Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Poultry Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Cattle &amp; Pig Slurries</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/m <sup>3</sup> )	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	<b>Total Potash</b> (Kg K <sub>2</sub> O/m <sup>3</sup> )	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /m <sup>3</sup> )	<b>Total Magnesium</b> (Kg MgO/m <sup>3</sup> )
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.

The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

<b>Biosolids</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stabilised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

<b>Other Organic Manures</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
<b>Composts</b>	(% DM)	(Kg N/t)	(Kg P <sub>2</sub> O <sub>5</sub> /t)	(Kg K <sub>2</sub> O/t)	(Kg SO <sub>3</sub> /t)	(Kg MgO/t)
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
<b>Digestates</b>						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
<b>Paper Crumble</b>						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
<b>Water Treatment Cake</b>						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
<b>Food industry 'wastes'</b>	(% DM)	(Kg N/m <sup>3</sup> )	(Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	(Kg K <sub>2</sub> O/m <sup>3</sup> )	(Kg SO <sub>3</sub> /m <sup>3</sup> )	(Kg MgO/m <sup>3</sup> )
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9<sup>th</sup> edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.



FORWARD ENVIRONMENTAL  
WHITE PARK 1-3  
STATION ROAD  
SHEFFIELD  
S20 3GS

**T596**

Please quote above code for all enquiries

FORWARD ENVIRONMENTA

EFFLUENT

## EFFLUENT (Metric Units)

Sample Reference : EFFLUENT BIO WASTE

Sample Matrix : EFFLUENT

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number	42011
Sample Number	78656

Date Received	04-FEB-2019
Date Reported	08-FEB-2019

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result	Amount per fresh tonne or m3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		6.99			
Oven Dry Solids	%	3.22	32.20	4025	kg DM
Total Nitrogen	% w/w	0.200	2.00	250	kg N
Ammonium Nitrogen	mg/kg	138	0.14	17.25	kg NH4-N
Nitrate Nitrogen	mg/kg	<10	< 0.01		kg NO3-N
Total Phosphorus (P)	mg/kg	585	1.34	167.46	kg P2O5
Total Potassium (K)	mg/kg	181	0.22	27.15	kg K2O
Total Magnesium (Mg)	mg/kg	111	0.18	23.03	kg MgO
Total Sulphur (S)	mg/kg	1917	4.79	599.06	kg SO3
Total Copper (Cu)	mg/kg	0.682	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	14.9	0.01	1.86	kg Zn
Total Sodium (Na)	mg/kg	3335	4.50	561.95	kg Na2O
Total Calcium (Ca)	mg/kg	351	0.35	43.88	kg Ca
Equivalent field application rate		—	1.00	125.00	tonnes or m3 / ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only. Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by *J Doyle*

Date *08/02/19*

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### Laboratory References

Report Number	42011
Sample Number	78656

Date Received	04-FEB-2019
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Date Reported	08-FEB-2019
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### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result
Conductivity 1:6	uS/cm	2542
Total Lead (Pb)	mg/kg	<0.5
Total Cadmium (Cd)	mg/kg	<0.01
Total Mercury (Hg)	mg/kg	<0.05
Total Nickel (Ni)	mg/kg	0.698
Total Chromium (Cr)	mg/kg	4.72

Released by

*J Doyle*

Date

*08/02/19*

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## How does your sample analysis compare with the 'standard' figures for organic manures?

<b>Farmyard Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Poultry Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Cattle &amp; Pig Slurries</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/m <sup>3</sup> )	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	<b>Total Potash</b> (Kg K <sub>2</sub> O/m <sup>3</sup> )	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /m <sup>3</sup> )	<b>Total Magnesium</b> (Kg MgO/m <sup>3</sup> )
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.

The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

<b>Biosolids</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stabilised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

<b>Other Organic Manures</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
<b>Composts</b>						
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
<b>Digestates</b>						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
<b>Paper Crumble</b>						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
<b>Water Treatment Cake</b>						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
<b>Food industry 'wastes'</b>						
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9<sup>th</sup> edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.





Purchase Order : 000234

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**F990**

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MEADOW FOODS

SLUDGE

## SLUDGE (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

**Laboratory References**

Report Number	18179
Sample Number	70327

Date Received 02-JUL-2018

Date Reported 11-JUL-2018

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result	Amount per fresh tonne or m3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		7.11			
Oven Dry Solids	%	0.870	8.70	3107	kg DM
Total Nitrogen	% w/w	0.070	0.70	250	kg N
Ammonium Nitrogen	mg/kg	207	0.21	73.93	kg NH4-N
Nitrate Nitrogen	mg/kg	<10	< 0.01		kg NO3-N
Total Phosphorus (P)	mg/kg	111	0.25	90.78	kg P2O5
Total Potassium (K)	mg/kg	81.4	0.10	34.89	kg K2O
Total Magnesium (Mg)	mg/kg	17.9	0.03	10.61	kg MgO
Total Sulphur (S)	mg/kg	24.9	0.06	22.23	kg SO3
Total Copper (Cu)	mg/kg	0.460	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	1.79	< 0.01		kg Zn
Total Sodium (Na)	mg/kg	212	0.29	102.06	kg Na2O
Total Calcium (Ca)	mg/kg	114	0.11	40.71	kg Ca
Equivalent field application rate		—	1.00	357.14	tonnes or m3 / ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only. Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by Darren WhitbreadDate 11/07/18

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Purchase Order : 000234

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### Laboratory References

Report Number 18179  
Sample Number 70327

Date Received 02-JUL-2018

Date Reported 11-JUL-2018

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result
Conductivity 1:6	uS/cm	448
Total Lead (Pb)	mg/kg	<0.5
Total Cadmium (Cd)	mg/kg	<0.01
Total Mercury (Hg)	mg/kg	<0.05
Total Nickel (Ni)	mg/kg	<0.2
Total Chromium (Cr)	mg/kg	<0.2
Water Soluble Magnesium	mg/kg	0.628
Water Soluble Phosphorus	mg/kg	59.2
Water Soluble Potassium	mg/kg	79.6

Released by *Darren Whitbread*

Date *11/07/18*

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## How does your sample analysis compare with the 'standard' figures for organic manures?

<b>Farmyard Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Poultry Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Cattle &amp; Pig Slurries</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/m <sup>3</sup> )	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	<b>Total Potash</b> (Kg K <sub>2</sub> O/m <sup>3</sup> )	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /m <sup>3</sup> )	<b>Total Magnesium</b> (Kg MgO/m <sup>3</sup> )
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.

The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

<b>Biosolids</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stabilised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

<b>Other Organic Manures</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
<b>Composts</b>						
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
<b>Digestates</b>						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
<b>Paper Crumble</b>						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
<b>Water Treatment Cake</b>						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
<b>Food industry 'wastes'</b>						
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9<sup>th</sup> edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.



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**F990**

Please quote above code for all enquiries

SECANIM

SLUDGE

## SLUDGE (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number 45668  
Sample Number 79668

Date Received 27-FEB-2019  
Date Reported 05-MAR-2019

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result	Amount per fresh tonne or m3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		7.93			
Oven Dry Solids	%	1.43	14.30	3972	kg DM
Total Nitrogen	% w/w	0.090	0.90	250	kg N
Ammonium Nitrogen	mg/kg	<50	< 0.01		kg NH4-N
Nitrate Nitrogen	mg/kg	67.6	0.07	18.78	kg NO3-N
Total Phosphorus (P)	mg/kg	173	0.40	110.05	kg P2O5
Total Potassium (K)	mg/kg	204	0.24	68.00	kg K2O
Total Magnesium (Mg)	mg/kg	30.7	0.05	14.16	kg MgO
Total Sulphur (S)	mg/kg	379	0.95	263.20	kg SO3
Total Copper (Cu)	mg/kg	0.312	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	3.63	< 0.01		kg Zn
Total Sodium (Na)	mg/kg	1094	1.47	409.65	kg Na2O
Total Calcium (Ca)	mg/kg	239	0.24	66.39	kg Ca
Equivalent field application rate		—	1.00	277.78	tonnes or m3 / ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only. Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by Darren Whitbread

Date 05/03/19

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## SLUDGE (Metric Units)

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The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number 45668  
Sample Number 79668

Date Received 27-FEB-2019  
Date Reported 05-MAR-2019

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result
Conductivity 1:6	uS/cm	830
Total Lead (Pb)	mg/kg	<0.5
Total Cadmium (Cd)	mg/kg	<0.01
Total Mercury (Hg)	mg/kg	<0.05
Total Nickel (Ni)	mg/kg	0.224
Total Chromium (Cr)	mg/kg	<0.2
Water Soluble Magnesium	mg/kg	9.75
Water Soluble Phosphorus	mg/kg	5.08
Water Soluble Potassium	mg/kg	146

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## How does your sample analysis compare with the 'standard' figures for organic manures?

<b>Farmyard Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Poultry Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Cattle &amp; Pig Slurries</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/m <sup>3</sup> )	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	<b>Total Potash</b> (Kg K <sub>2</sub> O/m <sup>3</sup> )	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /m <sup>3</sup> )	<b>Total Magnesium</b> (Kg MgO/m <sup>3</sup> )
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.

The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

<b>Biosolids</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stabilised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

<b>Other Organic Manures</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
<b>Composts</b>						
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
<b>Digestates</b>						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
<b>Paper Crumble</b>						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
<b>Water Treatment Cake</b>						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
<b>Food industry 'wastes'</b>						
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9<sup>th</sup> edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.



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AUTHENTIC FOOD CO

SLUDGE

## SLURRY/SLUDGE ANALYSIS RESULTS (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLURRY/SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number	33299
Sample Number	75510

Date Received	06-NOV-2018
Date Reported	12-NOV-2018

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result	Amount per fresh tonne or m3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		7.16			
Oven Dry Solids	%	4.42	44.20	3453	kg DM
Total Nitrogen	% w/w	0.320	3.20	250	kg N
Ammonium Nitrogen	mg/kg	1362	1.36	106.41	kg NH4-N
Nitrate Nitrogen	mg/kg	<10	< 0.01		kg NO3-N
Total Phosphorus (P)	mg/kg	756	1.73	135.26	kg P2O5
Total Potassium (K)	mg/kg	145	0.17	13.59	kg K2O
Total Magnesium (Mg)	mg/kg	379	0.63	49.15	kg MgO
Total Sulphur (S)	mg/kg	446	1.12	87.11	kg SO3
Total Copper (Cu)	mg/kg	3.11	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	16.0	0.02	1.25	kg Zn
Total Sodium (Na)	mg/kg	677	0.91	71.30	kg Na2O
Total Calcium (Ca)	mg/kg	1127	1.13	88.05	kg Ca
Equivalent field application rate		—	1.00	78.13	tonnes or m3 / ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only. Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by J Doyle

Date 12/11/18

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### Laboratory References

Report Number	33299
Sample Number	75510

Date Received	06-NOV-2018
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Date Reported	12-NOV-2018
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### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result
Conductivity 1:6	uS/cm	2267
Total Lead (Pb)	mg/kg	<0.5
Total Cadmium (Cd)	mg/kg	<0.01
Total Mercury (Hg)	mg/kg	<0.05
Total Nickel (Ni)	mg/kg	0.727
Total Chromium (Cr)	mg/kg	1.49
Water Soluble Magnesium	mg/kg	299
Water Soluble Phosphorus	mg/kg	<0.01
Water Soluble Potassium	mg/kg	131

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Date *12/11/18*

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## How does your sample analysis compare with the 'standard' figures for organic manures?

<b>Farmyard Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Poultry Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Cattle &amp; Pig Slurries</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/m <sup>3</sup> )	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	<b>Total Potash</b> (Kg K <sub>2</sub> O/m <sup>3</sup> )	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /m <sup>3</sup> )	<b>Total Magnesium</b> (Kg MgO/m <sup>3</sup> )
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.

The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

<b>Biosolids</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stabilised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

<b>Other Organic Manures</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
<b>Composts</b>	(% DM)	(Kg N/t)	(Kg P <sub>2</sub> O <sub>5</sub> /t)	(Kg K <sub>2</sub> O/t)	(Kg SO <sub>3</sub> /t)	(Kg MgO/t)
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
<b>Digestates</b>						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
<b>Paper Crumble</b>						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
<b>Water Treatment Cake</b>						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
<b>Food industry 'wastes'</b>	(% DM)	(Kg N/m <sup>3</sup> )	(Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	(Kg K <sub>2</sub> O/m <sup>3</sup> )	(Kg SO <sub>3</sub> /m <sup>3</sup> )	(Kg MgO/m <sup>3</sup> )
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9<sup>th</sup> edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.



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BURTWOOD BREWERY

SLUDGE

## SLURRY/SLUDGE ANALYSIS RESULTS (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLURRY/SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number 33298  
Sample Number 75509

Date Received 06-NOV-2018

Date Reported 12-NOV-2018

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result	Amount per fresh tonne or m3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		6.42			
Oven Dry Solids	%	3.81	38.10	2721	kg DM
Total Nitrogen	% w/w	0.350	3.50	250	kg N
Ammonium Nitrogen	mg/kg	1400	1.40	100.00	kg NH4-N
Nitrate Nitrogen	mg/kg	<10	< 0.01		kg NO3-N
Total Phosphorus (P)	mg/kg	987	2.26	161.45	kg P2O5
Total Potassium (K)	mg/kg	1116	1.34	95.66	kg K2O
Total Magnesium (Mg)	mg/kg	181	0.30	21.46	kg MgO
Total Sulphur (S)	mg/kg	169	0.42	30.18	kg SO3
Total Copper (Cu)	mg/kg	<0.2	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	0.709	< 0.01		kg Zn
Total Sodium (Na)	mg/kg	52.3	0.07	5.04	kg Na2O
Total Calcium (Ca)	mg/kg	4678	4.68	334.15	kg Ca
Equivalent field application rate		—	1.00	71.43	tonnes or m3 / ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only. Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by

J Doyle

Date

12/11/18

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BURTWOOD BREWERY

SLUDGE

## SLURRY/SLUDGE ANALYSIS RESULTS (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLURRY/SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number	33298
Sample Number	75509

Date Received	06-NOV-2018
---------------	-------------

Date Reported	12-NOV-2018
---------------	-------------

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result
Conductivity 1:6	uS/cm	3308
Total Lead (Pb)	mg/kg	<0.5
Total Cadmium (Cd)	mg/kg	<0.01
Total Mercury (Hg)	mg/kg	<0.05
Total Nickel (Ni)	mg/kg	<0.2
Total Chromium (Cr)	mg/kg	<0.2
Water Soluble Magnesium	mg/kg	176
Water Soluble Phosphorus	mg/kg	457
Water Soluble Potassium	mg/kg	1103

Released by

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Date

*12/11/18*

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## How does your sample analysis compare with the 'standard' figures for organic manures?

<b>Farmyard Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Poultry Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Cattle &amp; Pig Slurries</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/m <sup>3</sup> )	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	<b>Total Potash</b> (Kg K <sub>2</sub> O/m <sup>3</sup> )	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /m <sup>3</sup> )	<b>Total Magnesium</b> (Kg MgO/m <sup>3</sup> )
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.

The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

<b>Biosolids</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stabilised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

<b>Other Organic Manures</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
<b>Composts</b>						
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
<b>Digestates</b>						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
<b>Paper Crumble</b>						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
<b>Water Treatment Cake</b>						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
<b>Food industry 'wastes'</b>						
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9<sup>th</sup> edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.



## SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 2

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MERFYN JONES

SOILS

### Laboratory References

Report Number 78222  
Sample Number 281563

### ANALYTICAL RESULTS *on 'dry matter' basis.*

#### pH <sup>(1)</sup>

Determinand	Result	Soil pH						
		4	5	6	7	8	9	
Soil pH	5.7							

#### Soil Nutrients <sup>(1)</sup>

Determinand	Result mg/litre	Soil Index	Soil Index						
			0	1	2	3	4	5	6
Soil Phosphorus as P	23.4	2							
Soil Potassium as K	254	3							
Soil Magnesium as Mg	83.9	2							

#### Potentially Toxic Elements <sup>(2)</sup>

Determinand	Result mg/kg	Maximum mg/kg	% of maximum permissible concentration of PTE in arable/grassland soil					
			0%	25%	50%	75%	100%	
Total Copper as Cu	16.2	Arable 100						
		Grassland 170						
Total Zinc as Zn	69.3	Arable 200						
		Grassland 200						
Total Nickel as Ni	13.9	Arable 60						
		Grassland 100						
Total Cadmium as Cd	0.38	Arable 3						
		Grassland 3						
Total Lead as Pb	74.9	Arable 300						
		Grassland 300						
Total Chromium as Cr	32.2	Arable 400						
		Grassland 600						
Total Mercury as Hg	0.09	Arable 1						
		Grassland 1.5						

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by

*J Doyle*

Date

21/08/15

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## SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 3

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SOILS

### Laboratory References

Date Received 17-AUG-2015  
Date Reported 21-AUG-2015

Report Number 78222  
Sample Number 281564

### ANALYTICAL RESULTS on 'dry matter' basis.

#### pH <sup>(1)</sup>

#### Soil pH

Determinand	Result	4	5	6	7	8	9
Soil pH	5.4						

#### Soil Nutrients <sup>(1)</sup>

#### Soil Index

Determinand	Result mg/litre	Soil Index	0	1	2	3	4	5	6
Soil Phosphorus as P	22.4	2							
Soil Potassium as K	73.3	1							
Soil Magnesium as Mg	83.8	2							

#### Potentially Toxic Elements <sup>(2)</sup>

#### % of maximum permissible concentration of PTE in arable/grassland soil

Determinand	Result mg/kg	Maximum mg/kg	0%	25%	50%	75%	100%
Total Copper as Cu	17.4	Arable 80 Grassland 138					
Total Zinc as Zn	76.9	Arable 200 Grassland 200					
Total Nickel as Ni	13.5	Arable 50 Grassland 80					
Total Cadmium as Cd	0.42	Arable 3 Grassland 3					
Total Lead as Pb	68.1	Arable 300 Grassland 300					
Total Chromium as Cr	30.3	Arable 400 Grassland 600					
Total Mercury as Hg	0.11	Arable 1 Grassland 1.5					

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by *J Doyle*

Date *21/08/15*

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CRODA WIDNES

SLUDGE

## SLUDGE (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number	45669
Sample Number	79669

Date Received	27-FEB-2019
Date Reported	05-MAR-2019

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result	Amount per fresh tonne or m3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		7.45			
Oven Dry Solids	%	0.710	7.10	4438	kg DM
Total Nitrogen	% w/w	0.040	0.40	250	kg N
Ammonium Nitrogen	mg/kg	<50	< 0.01		kg NH4-N
Nitrate Nitrogen	mg/kg	<10	< 0.01		kg NO3-N
Total Phosphorus (P)	mg/kg	56.6	0.13	81.01	kg P2O5
Total Potassium (K)	mg/kg	50.7	0.06	38.03	kg K2O
Total Magnesium (Mg)	mg/kg	98.0	0.16	101.68	kg MgO
Total Sulphur (S)	mg/kg	87.7	0.22	137.03	kg SO3
Total Copper (Cu)	mg/kg	0.219	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	0.741	< 0.01		kg Zn
Total Sodium (Na)	mg/kg	561	0.76	472.64	kg Na2O
Total Calcium (Ca)	mg/kg	228	0.23	142.50	kg Ca
Equivalent field application rate		—	1.00	625.00	tonnes or m3 / ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only. Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by **Darren Whitbread**

Date **05/03/19**

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CRODA WIDNES

SLUDGE

## SLUDGE (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number	45669
Sample Number	79669

Date Received	27-FEB-2019
Date Reported	05-MAR-2019

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result
Conductivity 1:6	uS/cm	656
Total Lead (Pb)	mg/kg	<0.5
Total Cadmium (Cd)	mg/kg	<0.01
Total Mercury (Hg)	mg/kg	<0.05
Total Nickel (Ni)	mg/kg	<0.2
Total Chromium (Cr)	mg/kg	<0.2
Water Soluble Magnesium	mg/kg	74.0
Water Soluble Phosphorus	mg/kg	<0.01
Water Soluble Potassium	mg/kg	35.0

Released by *Darren Whitbread*

Date *05/03/19*

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## How does your sample analysis compare with the 'standard' figures for organic manures?

<b>Farmyard Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Poultry Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Cattle &amp; Pig Slurries</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/m <sup>3</sup> )	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	<b>Total Potash</b> (Kg K <sub>2</sub> O/m <sup>3</sup> )	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /m <sup>3</sup> )	<b>Total Magnesium</b> (Kg MgO/m <sup>3</sup> )
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.

The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

<b>Biosolids</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stabilised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

<b>Other Organic Manures</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
<b>Composts</b>	(% DM)	(Kg N/t)	(Kg P <sub>2</sub> O <sub>5</sub> /t)	(Kg K <sub>2</sub> O/t)	(Kg SO <sub>3</sub> /t)	(Kg MgO/t)
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
<b>Digestates</b>						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
<b>Paper Crumble</b>						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
<b>Water Treatment Cake</b>						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
<b>Food industry 'wastes'</b>	(% DM)	(Kg N/m <sup>3</sup> )	(Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	(Kg K <sub>2</sub> O/m <sup>3</sup> )	(Kg SO <sub>3</sub> /m <sup>3</sup> )	(Kg MgO/m <sup>3</sup> )
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9<sup>th</sup> edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.



Purchase Order : 000344

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**F990**

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ENCIRC

SLUDGE

## SLURRY/SLUDGE ANALYSIS RESULTS (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLURRY/SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

**Laboratory References**

Report Number 21767  
Sample Number 71789

Date Received 02-AUG-2018

Date Reported 07-AUG-2018

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result	Amount per fresh tonne or m3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		7.06			
Oven Dry Solids	%	0.640	6.40	2667	kg DM
Total Nitrogen	% w/w	0.060	0.60	250	kg N
Ammonium Nitrogen	mg/kg	114	0.11	47.50	kg NH4-N
Nitrate Nitrogen	mg/kg	<10	< 0.01		kg NO3-N
Total Phosphorus (P)	mg/kg	104	0.24	99.23	kg P2O5
Total Potassium (K)	mg/kg	65.8	0.08	32.90	kg K2O
Total Magnesium (Mg)	mg/kg	22.0	0.04	15.22	kg MgO
Total Sulphur (S)	mg/kg	196	0.49	204.17	kg SO3
Total Copper (Cu)	mg/kg	0.579	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	9.43	0.01	3.93	kg Zn
Total Sodium (Na)	mg/kg	438	0.59	246.01	kg Na2O
Total Calcium (Ca)	mg/kg	69.7	0.07	29.04	kg Ca
Equivalent field application rate		—	1.00	416.67	tonnes or m3 / ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only.

Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by *J Doyle*Date *07/08/18*

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ENCIRC

SLUDGE

## SLURRY/SLUDGE ANALYSIS RESULTS (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLURRY/SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number	21767
Sample Number	71789

Date Received	02-AUG-2018
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Date Reported	07-AUG-2018
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### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result
Conductivity 1:6	uS/cm	439
Total Lead (Pb)	mg/kg	<0.5
Total Cadmium (Cd)	mg/kg	<0.01
Total Mercury (Hg)	mg/kg	<0.05
Total Nickel (Ni)	mg/kg	0.296
Total Chromium (Cr)	mg/kg	0.999
Water Soluble Magnesium	mg/kg	3.78
Water Soluble Phosphorus	mg/kg	49.1
Water Soluble Potassium	mg/kg	51.4

Released by

*J Doyle*

Date

*07/08/18*

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## How does your sample analysis compare with the 'standard' figures for organic manures?

<b>Farmyard Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Poultry Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Cattle &amp; Pig Slurries</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/m <sup>3</sup> )	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	<b>Total Potash</b> (Kg K <sub>2</sub> O/m <sup>3</sup> )	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /m <sup>3</sup> )	<b>Total Magnesium</b> (Kg MgO/m <sup>3</sup> )
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.

The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

<b>Biosolids</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stabilised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

<b>Other Organic Manures</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
<b>Composts</b>						
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
<b>Digestates</b>						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
<b>Paper Crumble</b>						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
<b>Water Treatment Cake</b>						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
<b>Food industry 'wastes'</b>						
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9<sup>th</sup> edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.





Purchase Order : 000234

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**F990**

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KELLOGGS

LIQUID WASTE

## LIQUID WASTE (Metric Units)

Sample Reference : KELLOGGS

Sample Matrix : LIQUID WASTE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

**Laboratory References**

Report Number	18178
Sample Number	70326

Date Received 02-JUL-2018

Date Reported 10-JUL-2018

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result	Amount per fresh tonne or m3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		7.20			
Oven Dry Solids	%	1.11	11.10	3083	kg DM
Total Nitrogen	% w/w	0.090	0.90	250	kg N
Ammonium Nitrogen	mg/kg	175	0.17	48.61	kg NH4-N
Nitrate Nitrogen	mg/kg	<10	< 0.01		kg NO3-N
Total Phosphorus (P)	mg/kg	121	0.28	76.97	kg P2O5
Total Potassium (K)	mg/kg	127	0.15	42.33	kg K2O
Total Magnesium (Mg)	mg/kg	22.3	0.04	10.28	kg MgO
Total Sulphur (S)	mg/kg	25.1	0.06	17.43	kg SO3
Total Copper (Cu)	mg/kg	0.392	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	1.37	< 0.01		kg Zn
Total Sodium (Na)	mg/kg	106	0.14	39.69	kg Na2O
Total Calcium (Ca)	mg/kg	111	0.11	30.83	kg Ca
Equivalent field application rate		—	1.00	277.78	tonnes or m3 / ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only. Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by Darren WhitbreadDate 10/07/18

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Purchase Order : 000234

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KELLOGGS

LIQUID WASTE

## LIQUID WASTE (Metric Units)

Sample Reference : KELLOGGS

Sample Matrix : LIQUID WASTE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number	18178
Sample Number	70326

Date Received	02-JUL-2018
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Date Reported	10-JUL-2018
---------------	-------------

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result
Conductivity 1:6	uS/cm	320
Total Lead (Pb)	mg/kg	<0.5
Total Cadmium (Cd)	mg/kg	<0.01
Total Mercury (Hg)	mg/kg	<0.05
Total Nickel (Ni)	mg/kg	<0.2
Total Chromium (Cr)	mg/kg	<0.2
Water Soluble Magnesium	mg/kg	<0.01
Water Soluble Phosphorus	mg/kg	27.0
Water Soluble Potassium	mg/kg	42.0

Released by ..... *Darren Whitbread* .....

Date ..... *10/07/18* .....

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## How does your sample analysis compare with the 'standard' figures for organic manures?

<b>Farmyard Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Poultry Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Cattle &amp; Pig Slurries</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/m <sup>3</sup> )	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	<b>Total Potash</b> (Kg K <sub>2</sub> O/m <sup>3</sup> )	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /m <sup>3</sup> )	<b>Total Magnesium</b> (Kg MgO/m <sup>3</sup> )
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.

The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

<b>Biosolids</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stabilised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

<b>Other Organic Manures</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
<b>Composts</b>						
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
<b>Digestates</b>						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
<b>Paper Crumble</b>						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
<b>Water Treatment Cake</b>						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
<b>Food industry 'wastes'</b>						
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9<sup>th</sup> edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.



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**F990**

Please quote above code for all enquiries

MAELOR FOOD

SLUDGE

## SLUDGE (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number	45666
Sample Number	79666

Date Received	27-FEB-2019
---------------	-------------

Date Reported	04-MAR-2019
---------------	-------------

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result	Amount per fresh tonne or m3	Amount applied at an equivalent total Nitrogen application of 250 kg N/ha	Units
pH 1:6 [Fresh]		7.52			
Oven Dry Solids	%	4.56	45.60	3353	kg DM
Total Nitrogen	% w/w	0.340	3.40	250	kg N
Ammonium Nitrogen	mg/kg	901	0.90	66.25	kg NH4-N
Nitrate Nitrogen	mg/kg	<10	< 0.01		kg NO3-N
Total Phosphorus (P)	mg/kg	770	1.76	129.66	kg P2O5
Total Potassium (K)	mg/kg	190	0.23	16.76	kg K2O
Total Magnesium (Mg)	mg/kg	243	0.40	29.66	kg MgO
Total Sulphur (S)	mg/kg	762	1.90	140.07	kg SO3
Total Copper (Cu)	mg/kg	3.51	< 0.01		kg Cu
Total Zinc (Zn)	mg/kg	19.1	0.02	1.40	kg Zn
Total Sodium (Na)	mg/kg	674	0.91	66.81	kg Na2O
Total Calcium (Ca)	mg/kg	1047	1.05	76.99	kg Ca
Equivalent field application rate		—	1.00	73.53	tonnes or m3 / ha

The above equivalent field application rate for total nitrogen of 250 kg/ha has been provided purely for guidance purposes only. Organic manures should be used in accordance with the Defra Code of Good Agricultural Practice and where required within the specific regulatory guidance for the spreading of that material to land. To get the most benefit from your organic manures it is recommended that you follow the principles as set out in Defra's Fertiliser Manual (RB209) or as directed by a FACTS qualified adviser.

Released by **Darren Whitbread**

Date **04/03/19**

**NRM** Coopers Bridge, Braziers Lane, Bracknell, Berkshire RG42 6NS  
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**F990**

Please quote above code for all enquiries

MAELOR FOOD

SLUDGE

## SLUDGE (Metric Units)

Sample Reference : SLUDGE

Sample Matrix : SLUDGE

The sample submitted was of adequate size to complete all analysis requested.

The sample will be kept under refrigeration for at least 3 weeks.

### Laboratory References

Report Number	45666
Sample Number	79666

Date Received	27-FEB-2019
---------------	-------------

Date Reported	04-MAR-2019
---------------	-------------

### ANALYTICAL RESULTS *on 'as received' basis.*

Determinand on a fresh weight basis	Units	Result
Conductivity 1:6	uS/cm	1806
Total Lead (Pb)	mg/kg	<0.5
Total Cadmium (Cd)	mg/kg	<0.01
Total Mercury (Hg)	mg/kg	<0.05
Total Nickel (Ni)	mg/kg	0.592
Total Chromium (Cr)	mg/kg	1.17
Water Soluble Magnesium	mg/kg	145
Water Soluble Phosphorus	mg/kg	0.136
Water Soluble Potassium	mg/kg	180

Released by

*Darren Whitbread*

Date

*04/03/19*

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## How does your sample analysis compare with the 'standard' figures for organic manures?

<b>Farmyard Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Cattle FYM	25	6.0	3.2	9.4	2.4	1.8
Pig FYM	25	7.0	6.0	8.0	3.4	1.8
Sheep FYM	25	7.0	3.2	8.0	4.0	2.8
Duck FYM	25	6.5	5.5	7.5	2.6	2.4
Horse FYM	25	5.0	5.0	6.0	1.6	1.5
Goat FYM	40	9.5	4.5	12.0	2.8	1.8

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Poultry Manure</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
	20	9.4	8.0	8.5	3.0	2.7
	40	19.0	12.0	15.0	5.6	4.3
	60	28.0	17.0	21.0	8.2	5.9
	80	37.0	21.0	27.0	11.0	7.5

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 60% & 90% respectively.

<b>Cattle &amp; Pig Slurries</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/m <sup>3</sup> )	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /m <sup>3</sup> )	<b>Total Potash</b> (Kg K <sub>2</sub> O/m <sup>3</sup> )	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /m <sup>3</sup> )	<b>Total Magnesium</b> (Kg MgO/m <sup>3</sup> )
Cattle slurry	6.0	2.6	1.2	2.5	0.7	0.6
Dirty water (from cattle)	0.5	0.5	0.1	1.0	0.1	0.1
Separated cattle slurries						
- strainer box liquid	1.5	1.5	0.3	1.5	ND	ND
- weeping wall liquid	3.0	2.0	0.5	2.3	ND	ND
- mechanically separated liquid	4.0	3.0	1.2	2.8	ND	ND
- solid portion after separation	20.0	4.0	2.0	3.3	ND	ND
Pig slurry	4.0	3.6	1.5	2.2	0.7	0.7
Separated pig slurry - liquid	3.0	3.6	1.1	2.0	ND	ND
Separated pig slurry - solid	20.0	5.0	3.7	2.0	ND	ND

Notes: ND = no data.

The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively (50% & 100% for dirty water).

<b>Biosolids</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
Digested cake	25	11.0	11.0	0.6	8.2	1.6
Thermally dried	95	40.0	55.0	2.0	23.0	6.0
Lime stabilised	25	8.5	7.0	0.8	7.4	2.4
Composted	40	11.0	10.0	3.0	6.1	2.0

Notes: The 'standard' phosphate & potash availability figures to the next crop grown from Defra's Fertiliser Manual are 50% & 90% respectively.

<b>Other Organic Manures</b>	<b>Dry Matter</b> (% DM)	<b>Total Nitrogen</b> (Kg N/t)	<b>Total Phosphate</b> (Kg P <sub>2</sub> O <sub>5</sub> /t)	<b>Total Potash</b> (Kg K <sub>2</sub> O/t)	<b>Total Sulphur</b> (Kg SO <sub>3</sub> /t)	<b>Total Magnesium</b> (Kg MgO/t)
<b>Composts</b>						
Green compost	60	7.5	3.0	6.8	3.4	3.4
Green/food compost	60	11.0	4.9	8.0	5.1	3.4
Mushroom compost	35	6.0	5.0	9.0	ND	ND
<b>Digestates</b>						
Food-based whole	4.1	4.8	1.1	2.4	0.7	0.2
Food-based separated liquor	3.8	4.5	1.0	2.8	1.0	0.2
Food-based separated fibre	27.0	8.9	10.2	3.0	4.0	2.2
Farm-sourced whole	5.5	3.6	1.7	4.0	0.8	0.6
Farm-sourced separated liquor	3.0	1.9	0.6	2.5	<0.1	0.4
Farm-sourced separated fibre	24.0	5.6	4.7	6.0	1.2	1.8
<b>Paper Crumble</b>						
Chemically / physically treated	40	2.0	0.4	0.2	0.6	1.4
Biologically treated	30	7.5	3.8	0.4	2.4	1.0
<b>Water Treatment Cake</b>						
Water treatment cake	25	2.4	3.4	0.4	5.5	0.8
<b>Food industry 'wastes'</b>						
Dairy waste	4	1.0	0.8	0.2	ND	ND
Soft drinks waste	4	0.3	0.2	Trace	ND	ND
Brewing waste	7	2.0	0.8	0.2	ND	ND
General food waste	5	1.6	0.7	0.2	ND	ND

Notes: ND = no data.

The 'standard' figures for the above organic manures have been taken from Defra's Fertiliser Manual 2017 (RB209) 9<sup>th</sup> edition and the corresponding PLANET version 3 software. Further information on fertiliser recommendations for organic manures can be obtained from the Fertiliser Manual or from a FACTS qualified adviser.



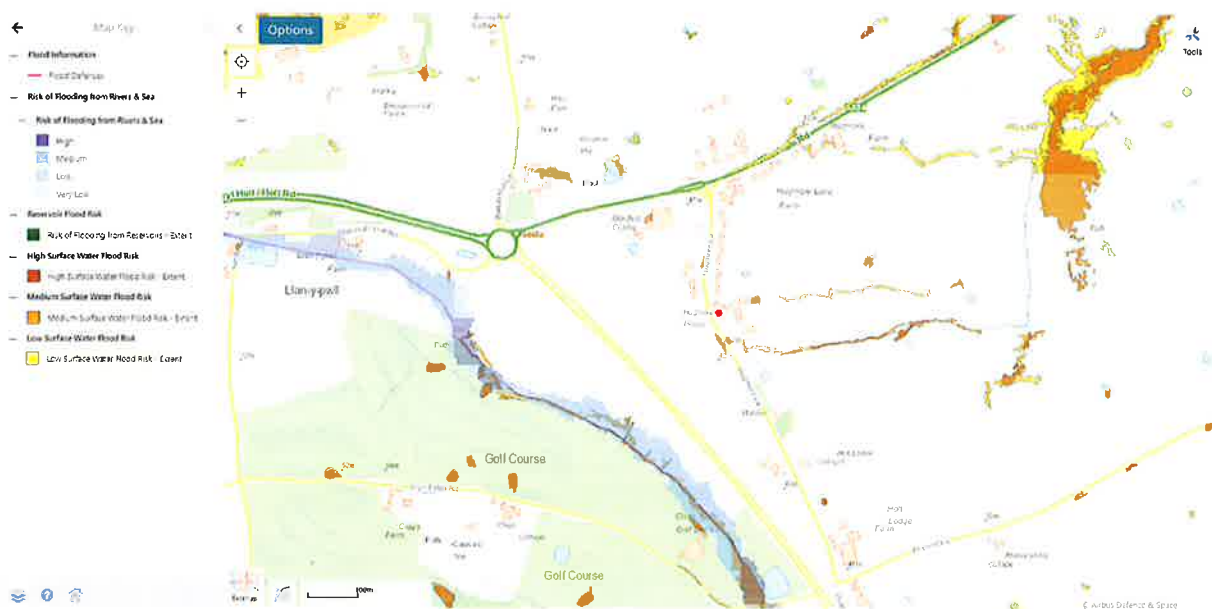
has emergency contact details. Anticipated location of storage tanks are shown in Figure 1, but locations may vary slightly due to unforeseen operational requirements.

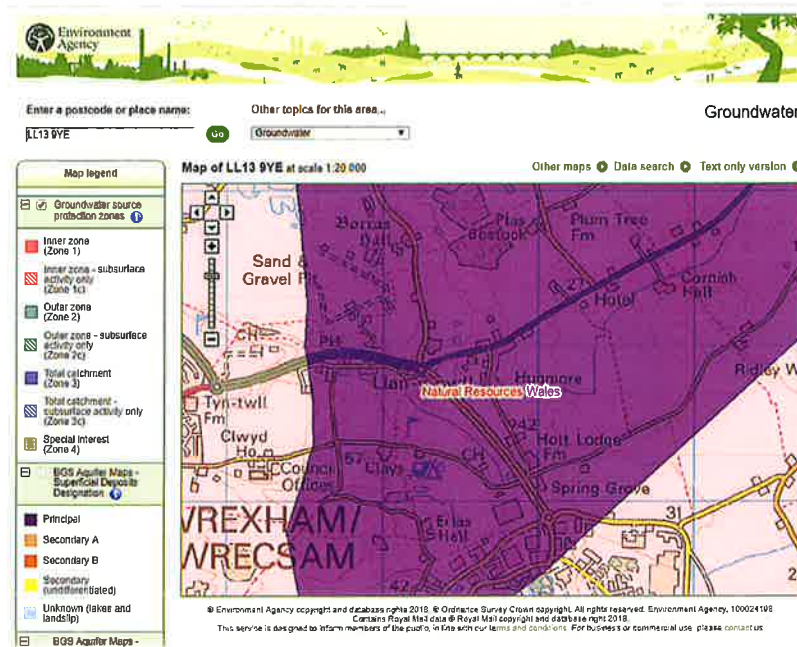
### 9. Sensitive Receptors

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 outside a flood prone area and the land is within a ground water protection zone 3 (Figure 3). The wastes 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](http://naturalresources.wales/evidence-and-data/maps/long-term-flood-risk)) and 'What's in my backyard' ([www.environment-agency.gov.uk](http://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](http://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).

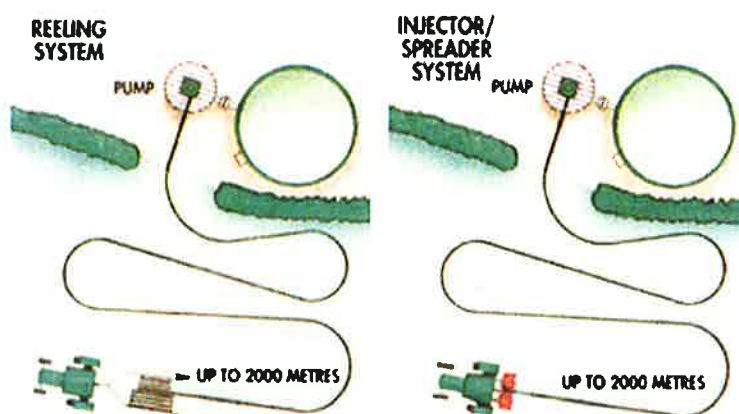
### **On-field sludge application methods to ensure consistent nutrient inputs across the field**

Nutrient inputs, as pre-notified, are based on the actual nutrient inputs from sludge applications during recent operations.

On delivery of the sludge the driver contacts the field operator to make him aware of the quantity and type of waste being deposited into the transfer tanks.

Once the level of the transfer tank has been checked and the field operator gives permission, the waste gets deposited into the transfer tank/s.

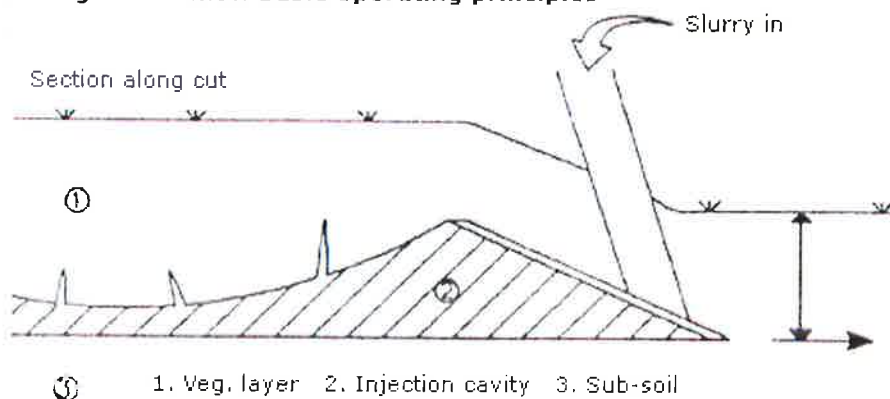
The field operator then activates the pump which pumps the sludge through an umbilical cord system to the sub soil injector mounted on the back of the field operator's tractor.



The waste is forced through four individual pipes and into four hollow injector legs.

Each injector leg is preceded by a disc which slices the soil in front of the injector leg. The injector leg has a set of angled wings which travel beneath the soil lifting it to create a pocket which will accommodate the sludge that is injected from the leg.

Diagram to show basic operating principles



The sludges are injected at different speeds/volumes depending on their nutrient content. This approach helps to ensure that the nutrients are deposited as evenly as possible. The sludge delivery to the injector can be controlled by adjusting the speed of the pump and by adjusting the driving speed of the tractor. For example, if sludge with high total nitrogen content is applied to the land, the pump engine revs can be lowered to reduce the injection rate. The operator can also adjust the speed of travel of the tractor to reduce the amount of sludge being injected to the soil.

Waste streams are generally controlled on total nitrogen input apart from where available phosphates or potash are likely to be greater than crop requirement/off take.

The above application methods help to ensure that field application rates are met and that the distribution of nutrients across the field is as even as possible, providing the required agricultural benefit to all areas of the crop, as well as providing other advantages (as stated by the manufacturer) as follow:

### **THE ADVANTAGES OF THE SUB-SOIL INJECTOR**

- Completely eliminates the environmental and nuisance problems previously associated with sludge and slurry disposal bringing more land into use closer to housing and sewage works.
- Higher application rates and significant transport economies.
- Un-rivalled nutrient benefit to crops no leaching occurs to atmosphere
- Even application with the absolute minimum of surface contamination and none of the surface run-off problems that can occur with top-spreading systems.

### **Control of waste quantities applied to the land-spreading site**

For each site a "field pack" is issued to the operator which consists of a map (showing spreading area, risks and hazards), a copy of the risk assessment, a spreading limit sheet and if available information about field drainage.

All waste which comes to the site is accompanied by a waste transfer note which is left at the field site for the operator. The operator uses this information to keep a daily check on the loads to the site. The waste transfer notes are brought to the main office on a weekly basis, where they are processed and documented. This provides a secondary system to ensure limits are not exceeded.

Trade Effluent Services Ltd.  
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## SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 1

MR ROB PIGGOTT  
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**F990**

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MR B PIGGOTT  
HUGMORE HOUSE

SOIL

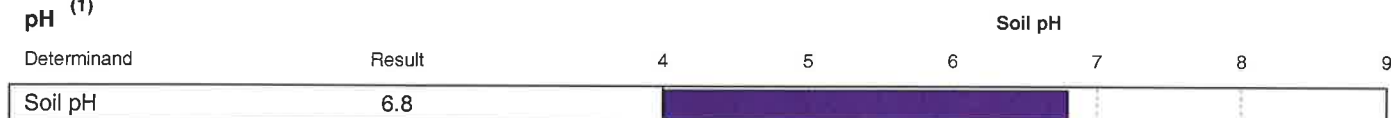
### Laboratory References

Date Received 10-AUG-2016  
Date Reported 12-AUG-2016

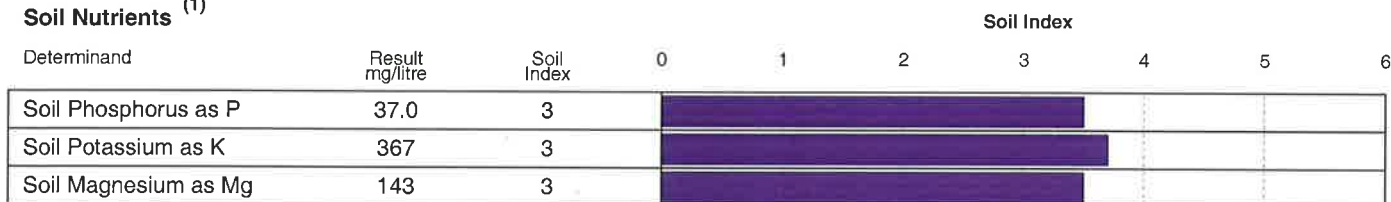
Report Number 27864  
Sample Number 314807

### ANALYTICAL RESULTS *on 'dry matter' basis.*

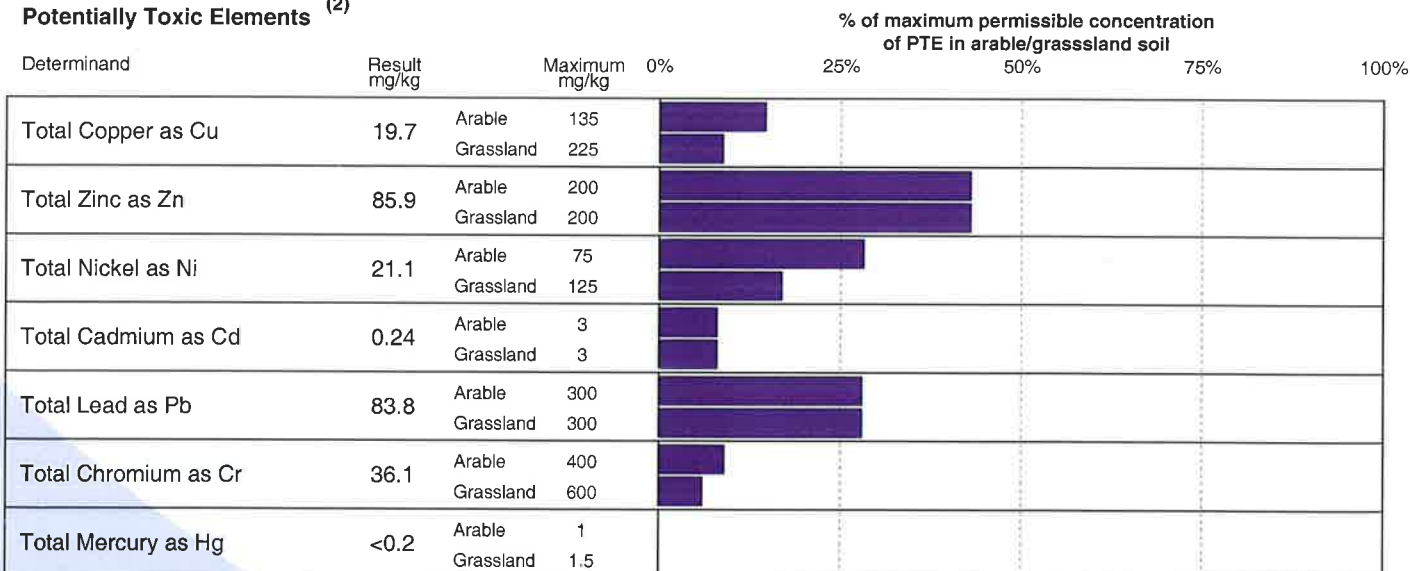
#### pH <sup>(1)</sup>



#### Soil Nutrients <sup>(1)</sup>



#### Potentially Toxic Elements <sup>(2)</sup>



(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by **Katie Dunn**

Date **12/08/16**

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## SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 2

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MR B PIGGOTT  
HUGMORE HOUSE

SOIL

### Laboratory References

Date Received 10-AUG-2016  
Date Reported 12-AUG-2016

Report Number 27864  
Sample Number 314808

### ANALYTICAL RESULTS *on 'dry matter' basis.*

#### pH <sup>(1)</sup>

Determinand	Result	Soil pH							
		4	5	6	7	8	9		
Soil pH	6.8								

#### Soil Nutrients <sup>(1)</sup>

Determinand	Result mg/litre	Soil Index	Soil Index							
			0	1	2	3	4	5	6	
Soil Phosphorus as P	39.0	3								
Soil Potassium as K	375	3								
Soil Magnesium as Mg	147	3								

#### Potentially Toxic Elements <sup>(2)</sup>

Determinand	Result mg/kg	Maximum mg/kg	% of maximum permissible concentration of PTE in arable/grassland soil						
			0%	25%	50%	75%	100%		
Total Copper as Cu	19.5	Arable 135							
		Grassland 225							
Total Zinc as Zn	85.2	Arable 200							
		Grassland 200							
Total Nickel as Ni	21.0	Arable 75							
		Grassland 125							
Total Cadmium as Cd	0.27	Arable 3							
		Grassland 3							
Total Lead as Pb	82.9	Arable 300							
		Grassland 300							
Total Chromium as Cr	37.1	Arable 400							
		Grassland 600							
Total Mercury as Hg	<0.2	Arable 1							
		Grassland 1.5							

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by **Katie Dunn**

Date **12/08/16**

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## SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 3

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**F990**

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MR B PIGGOTT  
HUGMORE HOUSE

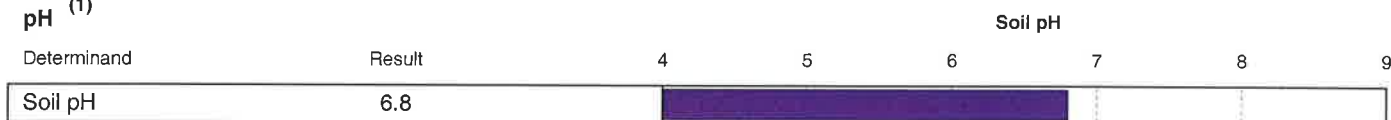
SOIL

### Laboratory References

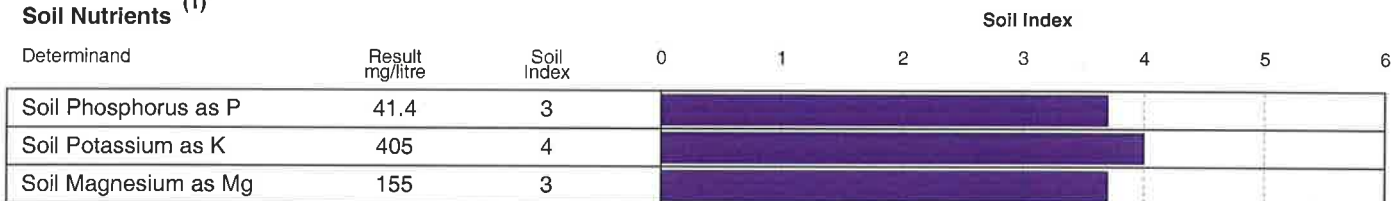
Report Number 27864  
Sample Number 314809

### ANALYTICAL RESULTS *on 'dry matter' basis.*

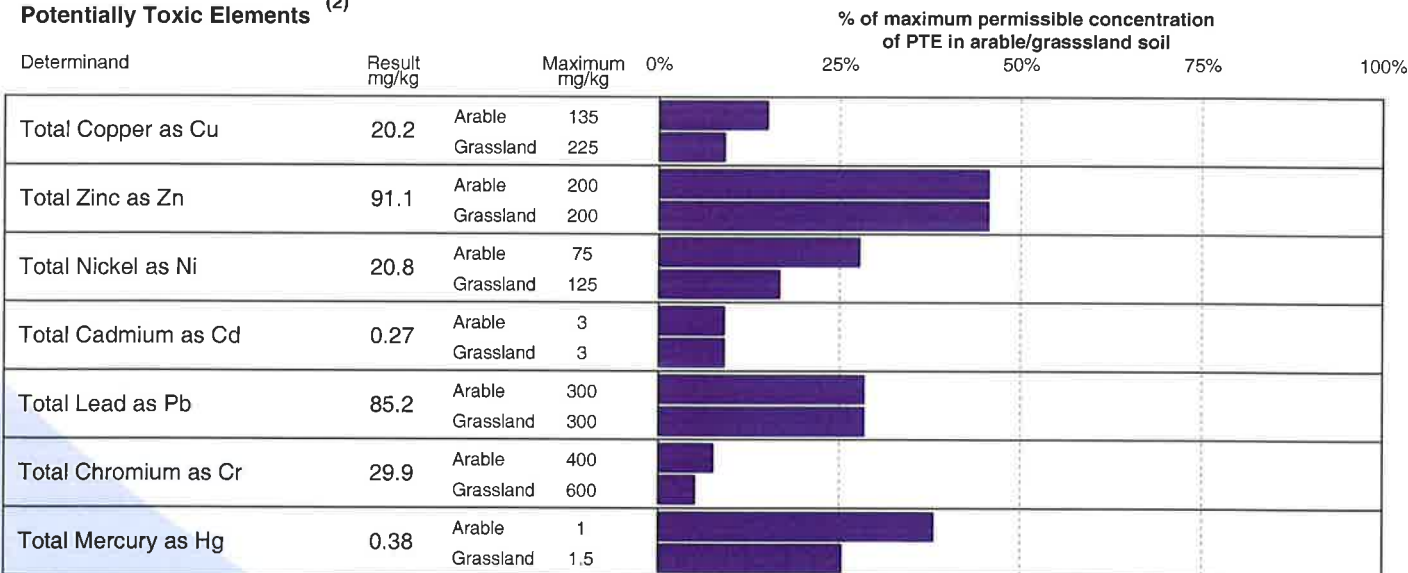
#### pH <sup>(1)</sup>



#### Soil Nutrients <sup>(1)</sup>



#### Potentially Toxic Elements <sup>(2)</sup>



(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by **Katie Dunn**

Date **12/08/16**

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## SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 4

MR ROB PIGGOTT  
TRADE EFFLUENT SERVICES  
HUGMOOR HOUSE  
HUGMOOR  
LLANYPWLL  
WREXHAM LL13 9YE

F990

Please quote above code for all enquiries

Date Received 07-APR-2017  
Date Reported 12-APR-2017

MR BRIAN PIGGOTT  
HUGMORE HOUSE  
HUGMORE LANE

SOIL

### Laboratory References

Report Number 55339  
Sample Number 338728

### ANALYTICAL RESULTS on 'dry matter' basis.

#### pH <sup>(1)</sup>

Determinand	Result	Soil pH						
		4	5	6	7	8	9	
Soil pH	5.9							

#### Soil Nutrients <sup>(1)</sup>

Determinand	Result mg/litre	Soil Index	Soil Index						
			0	1	2	3	4	5	6
Soil Phosphorus as P	8.2	0							
Soil Potassium as K	82.8	1							
Soil Magnesium as Mg	191	4							

#### Potentially Toxic Elements <sup>(2)</sup>

Determinand	Result mg/kg	Maximum mg/kg	% of maximum permissible concentration of PTE in arable/grassland soil					
			0%	25%	50%	75%	100%	
Total Copper as Cu	15.3	Arable 100						
		Grassland 170						
Total Zinc as Zn	82.6	Arable 200						
		Grassland 200						
Total Nickel as Ni	21.4	Arable 60						
		Grassland 100						
Total Cadmium as Cd	0.29	Arable 3						
		Grassland 3						
Total Lead as Pb	56.2	Arable 300						
		Grassland 300						
Total Chromium as Cr	35.7	Arable 400						
		Grassland 600						
Total Mercury as Hg	<0.2	Arable 1						
		Grassland 1.5						

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by

*Darren Whitbread*

Date

*12/04/17*

NRM Coopers Bridge, Braziers Lane, Bracknell, Berkshire RG42 6NS

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## SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 5

MR ROB PIGGOTT  
TRADE EFFLUENT SERVICES  
HUGMOOR HOUSE  
HUGMOOR  
LLANYPWLL  
WREXHAM LL13 9YE

**F990**

Please quote above code for all enquiries

MR BRIAN PIGGOTT  
HUGMORE HOUSE  
HUGMORE LANE

SOIL

### Laboratory References

Report Number 55339  
Sample Number 338729

### ANALYTICAL RESULTS *on 'dry matter' basis.*

#### pH <sup>(1)</sup>

Determinand	Result	Soil pH							
		4	5	6	7	8	9		
Soil pH	6.1								

#### Soil Nutrients <sup>(1)</sup>

Determinand	Result mg/litre	Soil Index	Soil Index							
			0	1	2	3	4	5	6	
Soil Phosphorus as P	7.4	0								
Soil Potassium as K	87.8	1								
Soil Magnesium as Mg	229	4								

#### Potentially Toxic Elements <sup>(2)</sup>

Determinand	Result mg/kg	Maximum mg/kg	% of maximum permissible concentration of PTE in arable/grassland soil						
			0%	25%	50%	75%	100%		
Total Copper as Cu	15.2	Arable 135							
		Grassland 225							
Total Zinc as Zn	79.4	Arable 200							
		Grassland 200							
Total Nickel as Ni	22.0	Arable 75							
		Grassland 125							
Total Cadmium as Cd	0.29	Arable 3							
		Grassland 3							
Total Lead as Pb	53.7	Arable 300							
		Grassland 300							
Total Chromium as Cr	38.1	Arable 400							
		Grassland 600							
Total Mercury as Hg	<0.2	Arable 1							
		Grassland 1.5							

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by **Darren Whitbread**

Date **12/04/17**

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## SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 6

MR ROB PIGGOTT  
TRADE EFFLUENT SERVICES  
HUGMOOR HOUSE  
HUGMOOR  
LLANYPWLL  
WREXHAM LL13 9YE

**F990**

Please quote above code for all enquiries

Date Received 07-APR-2017  
Date Reported 12-APR-2017

MR BRIAN PIGGOTT  
HUGMORE HOUSE  
HUGMORE LANE

SOIL

### Laboratory References

Report Number 55339  
Sample Number 338730

### ANALYTICAL RESULTS on 'dry matter' basis.

#### pH <sup>(1)</sup>

#### Soil pH

Determinand	Result	4	5	6	7	8	9
Soil pH	6.1						

#### Soil Nutrients <sup>(1)</sup>

#### Soil Index

Determinand	Result mg/litre	Soil Index	0	1	2	3	4	5	6
Soil Phosphorus as P	14.8	1							
Soil Potassium as K	69.4	1							
Soil Magnesium as Mg	162	3							

#### Potentially Toxic Elements <sup>(2)</sup>

#### % of maximum permissible concentration of PTE in arable/grassland soil

Determinand	Result mg/kg	Maximum mg/kg	0%	25%	50%	75%	100%
Total Copper as Cu	18.2	Arable 135 Grassland 225					
Total Zinc as Zn	86.8	Arable 200 Grassland 200					
Total Nickel as Ni	23.4	Arable 75 Grassland 125					
Total Cadmium as Cd	0.30	Arable 3 Grassland 3					
Total Lead as Pb	66.7	Arable 300 Grassland 300					
Total Chromium as Cr	38.0	Arable 400 Grassland 600					
Total Mercury as Hg	<0.2	Arable 1 Grassland 1.5					

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by **Darren Whitbread**

Date **12/04/17**

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## SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 7

MR ROB PIGGOTT  
TRADE EFFLUENT SERVICES  
HUGMOOR HOUSE  
HUGMOOR  
LLANYPWLL  
WREXHAM LL13 9YE

**F990**

Please quote above code for all enquiries

MR BRIAN PIGGOTT  
HUGMORE HOUSE  
HUGMORE LANE

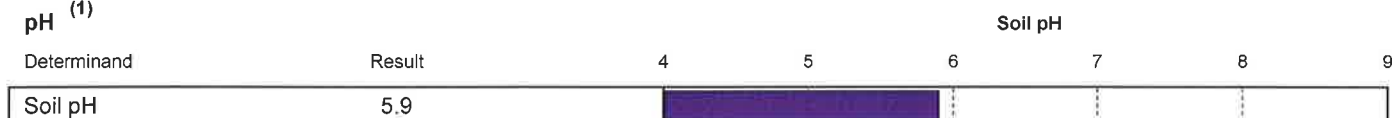
SOIL

### Laboratory References

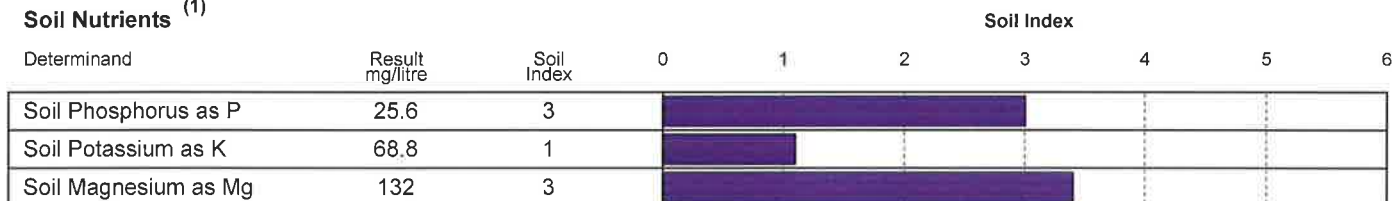
Report Number 55339  
Sample Number 338731

### ANALYTICAL RESULTS *on 'dry matter' basis.*

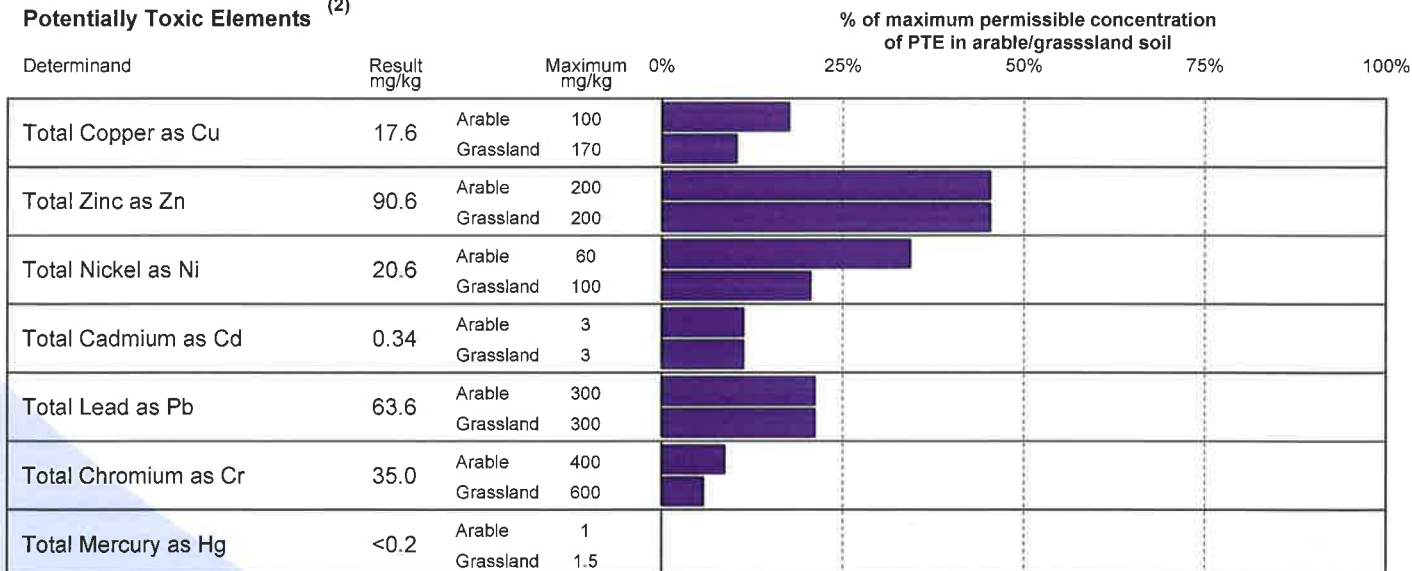
#### pH <sup>(1)</sup>



#### Soil Nutrients <sup>(1)</sup>



#### Potentially Toxic Elements <sup>(2)</sup>



(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by **Darren Whitbread**

Date **12/04/17**

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## SOIL CHEMICAL ANALYSIS REPORT FOR FIELD - 1

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WREXHAM LL13 9YE

**F990**

Please quote above code for all enquiries

Date Received 17-AUG-2015  
Date Reported 21-AUG-2015

MERFYN JONES

SOILS

### Laboratory References

Report Number 78222  
Sample Number 281562

### ANALYTICAL RESULTS *on 'dry matter' basis.*

#### pH <sup>(1)</sup>

Determinand	Result	Soil pH
Soil pH	5.7	

#### Soil Nutrients <sup>(1)</sup>

Determinand	Result mg/litre	Soil Index	Soil Index
Soil Phosphorus as P	33.6	3	
Soil Potassium as K	72.9	1	
Soil Magnesium as Mg	109	3	

#### Potentially Toxic Elements <sup>(2)</sup>

Determinand	Result mg/kg	Maximum mg/kg	% of maximum permissible concentration of PTE in arable/grassland soil
Total Copper as Cu	14.8	Arable 100 Grassland 170	
Total Zinc as Zn	70.6	Arable 200 Grassland 200	
Total Nickel as Ni	16.4	Arable 60 Grassland 100	
Total Cadmium as Cd	0.38	Arable 3 Grassland 3	
Total Lead as Pb	54.0	Arable 300 Grassland 300	
Total Chromium as Cr	56.0	Arable 400 Grassland 600	
Total Mercury as Hg	0.07	Arable 1 Grassland 1.5	

(1) Recommendations for liming and fertiliser should be obtained from Defra's Fertiliser Manual (RB209). The analytical methods used are as described in Defra's RB427.

(2) Concentration of Potentially Toxic Elements (PTE, commonly referred to as 'heavy metals') are in mg/kg dry soil. The maximum and the percentage of this maximum permissible concentration of PTE in soil are derived from the values in Defra's Code of Practice for Agricultural Use of Sewage Sludge (England & Wales) 1996. If applying organic manures to this soil it is important to ensure the soil is managed with a pH no less than 5.0, and that the PTE maximum values are not exceeded following the application. For soil where the pH value is less than 5.2, a FACTS Qualified Adviser should be consulted. Further details are provided in the Sludge Code.

Released by

*J Doyle*

Date

*21/08/15*

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## Agricultural Benefit Statement

### Report Index

1. Permit Details and Appropriate Technical Expertise
2. Land Details
3. Waste Details
4. Operational Details
5. Fields and Crop Requirement
6. NVZ Compliance
7. Benefits of The Operation
8. Potential Negative Impacts
9. Sensitive Receptors
10. Contingency Planning
11. Appendix C – Soil Analysis
12. Appendix D – Waste Analysis

### 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).

Relevant Qualifications & Experience include:

- FACTs Qualified – Basis registration no. R/FE/5689
- 9 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 up to 10 wastes to land. The land details are listed in Table 1, and the site map can be found in Figure 1. This benefit statement is one of two for this land, where the waste streams Encirc and Sykes (Sefton Seafoods) are also registered.

**Table 1: Farm and Land Details**

<b>Farm Name</b>	Bryn Villa; Hugmore House
<b>Farm Address and Postcode</b>	Hugmore Lane, Llan-y-pwll, LL13 9YE (both farms)
<b>Land Address and Nearest Postcode</b>	Land at Rhosrobin, LL14 4YL; Hugmore Lane, Llan-y-pwll, LL13 9YE
<b>Total Area to be Spread (hectares)</b>	16.2; 20.4 (totalling 36.6)

Up to 30m<sup>3</sup> of waste will be stored in each mobile storage tank at the land to be spread, with no more than 120m<sup>3</sup> in total being stored on site. This is suitable storage and the storage tank locations will be situated in appropriate locations. The storage locations are marked on the site map in Figure 1a & 1b, which are at the following grid reference locations: SJ 37829

51617, SJ 32799 52711 and SJ 38333 51296. A lagoon is also available for temporary storage at the following location: SJ 37786 51673.

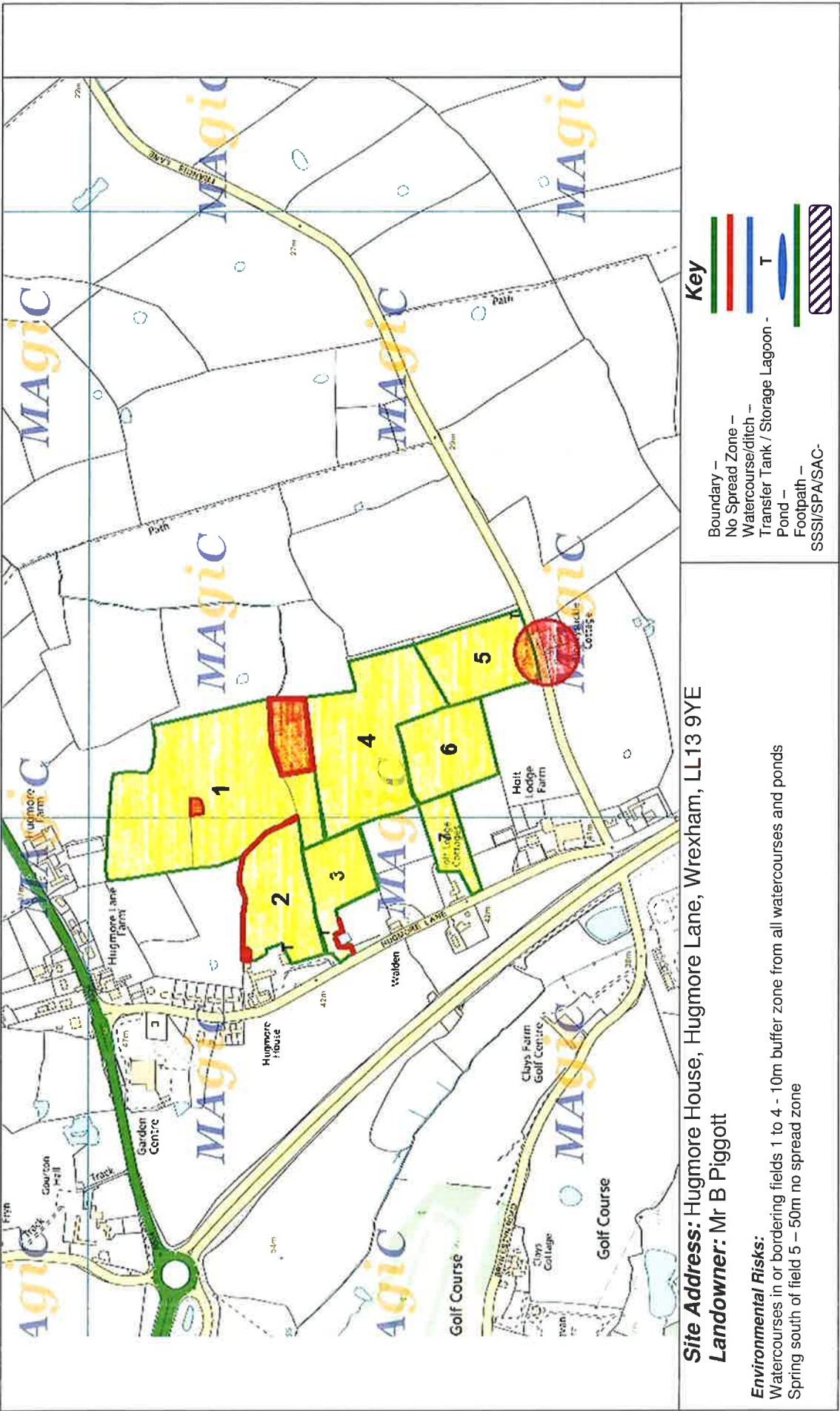
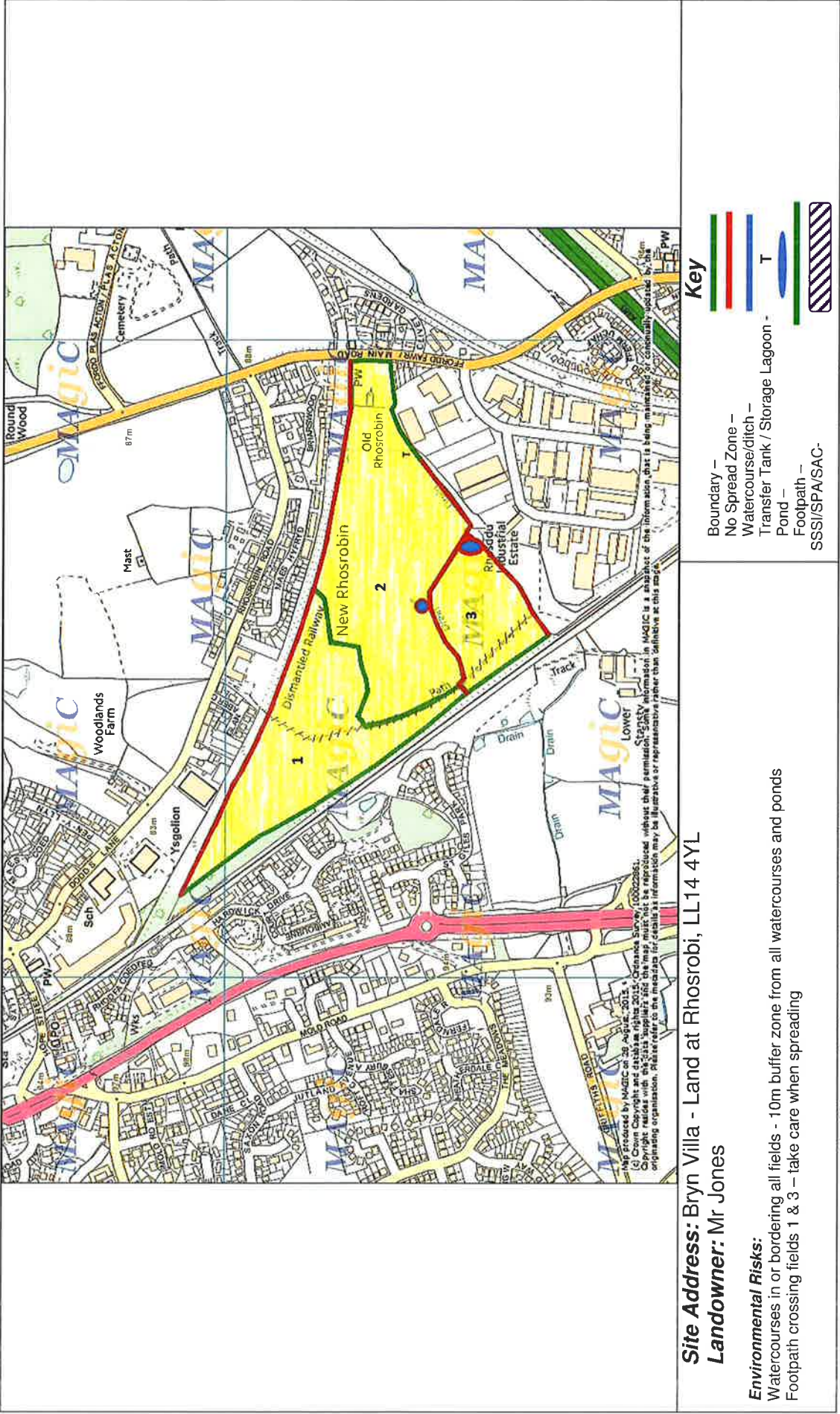


Figure 1a: Site map including the fields to spread, receptors, storage (T), and spreading control measures





### 3. Waste Details

The wastes generally arise from food and beverage manufacturers and are primarily sludge from on-site effluent treatment plants, and materials unsuitable for consumption and processing. The waste details are displayed in Table 2.

**Table 2: Waste Details**

<b>Waste Producer</b>	<b>EWC Code</b>	<b>Waste Description</b>
Secanim	02 02 04	Sludges from on-site ETP from abattoirs, poultry preparation plants, rendering plants or fish preparation plants only
P Z Cussons	07 07 12	Sludges from on-site biological effluent treatment plant at chemical manufacturing sites other than those mentioned in 07 01 11 only
Croda Chemicals (Goole)	07 07 12	Sludges from on-site biological effluent treatment plant at chemical manufacturing sites other than those mentioned in 07 01 11 only
Meadow Foods	02 05 02	Sludge from on-site ETP
Maelor Foods	02 02 01	Sludges from washing and cleaning
Encirc	02 07 05	Sludge from on-site ETP
Burtonwood Brewery	02 07 04	Materials unsuitable for consumption or processing
Croda Widnes	02 03 05	Sludges from on-site ETP
Authentic Food Company	02 03 05	Sludges from on-site ETP
Kelloggs (Kellogs)	02 03 05	Sludges from on-site ETP

The wastes have been analysed by NRM laboratories for nitrogen, phosphorous, potash and PTE's, and individual waste analyses are attached in Appendix D.

To avoid the need for multiple deployments 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 the timing of application (before seedbed preparation).

Due to the coding of the Secanim waste stream (02 02 04), a visual inspection was made to determine if analysis for fats, oil and grease (FOGs) was required. It was deemed not necessary. The waste will be closely monitored during the spreading of this site, and so the requirement for FOGs analysis will be reviewed periodically.

With the pH of the fields around 6 we do not anticipate any negative effects and this has been accepted on previous deployments until a new sample is obtained.

#### **4. Operational Details**

The wastes will be delivered to the site by road tanker and off-loaded into the mobile storage tanks. It is intended to spread the wastes by sub-soil injection to reduce the risk of environmental incidents, such as run-off and odour issues; to minimise disbenefit to the growing crop, such as through smothering or leaf scorch; and to provide nutrients to the root zone. Typically, wastes will be applied by deep-leg injector. However, a shallow injector or surface application 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.

It is intended to spread the wastes to grass fields as a split when the leaf is short or after silage cuts. For this application, the wastes are expected to be applied to all fields in April 2018 (before the growing season). However, this may change due to farmer requirements and weather conditions.



### 5. Fields and Crop Requirement

The sludges 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 (9<sup>th</sup> 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
1	7.2	SJ 38052 51803	Grass	2 cut silage and grazing	38	325	20 ( <b>64*</b> )	70 ( <b>228*</b> )
2	2.4	SJ 37854 51686	Grass	2 cut silage and grazing	38	325	20 ( <b>64*</b> )	70 ( <b>228*</b> )
3	1.2	SJ 37916 51585	Grass	2 cut silage and grazing	38	325	20 ( <b>64*</b> )	240
4	4.5	SJ 38128 51553	Grass	2 cut silage and grazing	38	325	205	240
5	2.2	SJ 38265 51352	Grass	2 cut silage and grazing	38	325	205	240
6	1.9	SJ 38110 51414	Grass	2 cut silage and grazing	38	325	145	240
7	1.0	SJ 37932 51393	Grass	2 cut silage and grazing	38	325	20 ( <b>64*</b> )	240
1 <sup>Rh</sup>	5.6	SJ 32347 52886	Grass	2 cut silage and grazing	38	325	20 ( <b>64*</b> )	240
2 <sup>Rh</sup>	8.1	SJ 32642 52762	Grass	2 cut silage and grazing	38	325	65	70 ( <b>228*</b> )
3 <sup>Rh</sup>	2.5	SJ 32583 52611	Grass	2 cut silage and grazing	38	325	65	240
<b>Total</b>	<b>36.4</b>							

Rh – fields 1-3 for the land at Rhosrobin (Bryn Villa)

The soil nitrogen supply (SNS) for all fields is moderate.

## 6. NVZ Compliance

The site falls outside an NVZ designated area, which is illustrated in Figure 2. The application rates of the wastes 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 NVZ mapping service on the Welsh government website ([lle.gov.wales/apps/nvz/](http://lle.gov.wales/apps/nvz/)).**

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 listed months are 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 (9<sup>th</sup> edition, section 2). Fields 1-4 were spread in June 2017 for deployment PAN-000624 and fields 5-7 were spread in September 2017 for deployment PAN-001597.

**Table 4: Previous Nutrients Applied**

<b>Field</b>	<b>Waste Applied</b>	<b>Month Applied</b>	<b>Application Rate</b>	<b>Nitrogen</b>	<b>Phosphate</b>	<b>Potash</b>
			t/ha	kg/ha	kg/ha	kg/ha
1	Commercial Waste	September 2018	100	123	62	79
2	Commercial Waste	September 2018	100	123	62	79
3	Commercial Waste	September 2018	100	123	62	79
4	Commercial Waste	September 2018	100	123	62	79
1	Commercial Waste	October 2018	90	110	48	71
2	Commercial Waste	October 2018	90	110	48	71
3	Commercial Waste	October 2018	90	110	48	71

## 7. Benefits of The Operation

The wastes 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 wastes will also provide benefit through the addition of organic matter and trace elements. The applied nutrients provided by the wastes 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.

A summary of the wastes and the proposed application rates are listed in Table 5.

**Table 5: Summary of Waste Nutrients and Application Rate**

Waste	App Rate	Nitrogen		Phosphate		Potash	
		(total)	(available) 30%	(total)	(available) 50%	(total)	(available) 90%
Secanim	162	145	44	65	32	39	35
P Z Cussons (Rob Morgan)	208	248	74	8	4	8	7.2
Croda Chemicals (Goole)	47	94	28	63	32	10	9
Meadow Foods	222	155	47	56	28	22	20
Maelor Foods	36	122	37	63	32	8	7
Encirc	234	140	42	56	28	19	17
Burtonwood Brewery	24	84	25	54	27	32	29
Croda Widnes	250	100	30	33	16	15	14
Authentic Food Company	32	102	31	55	28	6	5
Kelloggs (Kellogs)	201	181	54	56	28	31	28

Wastes will be applied on an individual basis and applications, which are established for each waste when applied in isolation, will be carefully managed and monitored to ensure that nutrients are applied at or below crop requirement/offtake values. It may however be necessary to apply the wastes as a mix such as during storage during adverse weather. In this case, the waste with the highest nutrient, PTE or other limiting factor is used as the maximum application rate, and thus wastes will be applied at the lowest individual application rate. Application rates will be adjusted by variation in tractor speed and or pump speed. It should be noted that if application rates are adjusted, they will not be increased above the application rates stated in this benefit statement (see Table 5). As this is one of two deployments for the land, the wastes across both will be carefully monitored and application rates will be adjusted accordingly, as outlined above. It should be noted that if application rates are adjusted, they will not be increased above the application rates stated in this benefit statement (see Table 5).

## Nitrogen

The waste analysis shows that the ammoniacal and nitrate nitrogen in the majority of wastes 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

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 wastes applied will supply up to 32kg/ha of potash, which will not meet crop offtake for all fields, but it will allow the landowner/farmer to considerably reduce the amount of chemical fertiliser required to meet the crop need. Applications of wastes are limited to ensure that potash is applied at or below crop off take values, as calculated from the RB209, ensuring that the spreading activities do not increase soil reserves.

## Organic Matter

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

## pH

Pz Cussions (Rob Morgan) has a pH of 4.45 which is slightly acidic, the receiving soil have pH ranging from 5.9 to 6.8 and will buffer the waste pH with not detrimental effect anticipated. The soils at Hugmore are classified on soil scapes as Loamy and clayey soils floodplain soils with naturally high groundwater. These soil types are at a much lower of risk to the effect of pH than other soils such as Non-calcareous sandy soils. PZ Cussion will not be spread on the land at Rhosrobin

## 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
1	6.8	37.0	3	367	3	143	3

2	6.8	39.0	3	375	3	147	3
3	6.8	41.4	3	405	4	155	3
4	5.9	8.2	0	82.8	1	191	4
5	6.1	7.4	0	87.8	1	229	4
6	6.1	14.8	1	69.4	1	162	3
7	5.9	25.6	3	68.8	1	132	3
1 (Rhosrobin)	5.7	33.6	3	72.9	1	109	3
2 (Rhosrobin)	5.7	23.4	2	254	3	83.9	2
3 (Rhosrobin)	5.4	22.4	2	73.3	1	83.8	2

The soils were sampled in August 2015 for fields 1 (Rhosrobin) - 3 (Rhosrobin), in August 2016 for fields 1-3, and April 2017 for fields 4-7 in accordance with the sampling procedures described in the RB209 (9<sup>th</sup> 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 loamy to medium loam categorised in accordance with RB209 (9<sup>th</sup> edition) as mineral soils for crop recommendations. Soils SNS for all fields are moderate

Soil pH ranges from 5.4 and 6.8, and are generally at or around the target value, although it shouldn't affect crop performance. Soil P index's range from 0 to 3, and the soils are generally at or above the guideline target index of 2. Soil K levels ranged from index 1 to 4 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 wastes.

### 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 wastes have the potential to cause odour, however storage will be sited away from dwellings, and it is unlikely to cause nuisance odour issues. Additionally, application of sludge via an umbilical cord sub soil injection system will minimise the risk of odour. The operation will be carried out in accordance within normal agricultural hours to minimise the risk of odour and noise complaints.

### Storage Tanks

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