



Our Ref: SLC/05/HC/1787
Your Ref: as below

24th October 2005

British Sugar plc Co-Products
Oundle Road
Peterborough
PE2 9QU

Attention: Andy Spetch

Dear Mr Spetch

TOPSOIL Analysis Report: Wissington Factory – WI/11-10-05/20mmA

We have completed the analysis of the TOPSOIL sample recently submitted by the Wissington factory and have pleasure reporting our findings. Our assessment is based purely on the examination and analysis of the received sample.

The purpose of the analysis was to determine the suitability of the TOPSOIL sample for general landscaping purposes.

SOIL EXAMINATION

The sample was described as a very dark brown, slightly moist, friable, sandy loam with a moderately developed fine to coarse granular structure*. The sample was slightly stony and no observable deleterious materials, roots or rhizomes of pernicious weeds were observed.

* This appraisal of soil structure was made from examination of a disturbed sample(s).

LABORATORY ANALYSIS

The sample was submitted to a UKAS and MCERTS accredited laboratory for routine physical and chemical parameters to confirm the composition and fertility of the soil, and the absence of potential contaminants. The following parameters were determined:

- pH value;
- electrical conductivity (salinity)- CaSO₄ & water extracts;
- major plant nutrients – N, P, K, Mg;
- organic matter content;
- particle size analysis & stone content;
- heavy metals (As, Cd, Cr, Cu, Pb, Hg, Ni, Se, Zn, B);
- total cyanide & total (mono) phenols;
- total sulphur & sulphate;
- acid volatile sulphide;
- speciated PAHs (US EPA 16);
- total petroleum hydrocarbons (C10-C40).

The results are presented on the attached Certificate of Analysis and an interpretation of the results is given below. The interpretation considers the use of the TOPSOIL for general landscaping purposes and its compliance/non-compliance with our *general landscape specification*.

We are not aware of any specified contaminant levels set for the proposed end-use of this topsoil so the following comments are based on the Soil Guideline Values (SGVs) for residential end-use presented in the Contaminated Land Exposure Assessment (CLEA) Model (EA/DEFRA:2002). The SGVs currently only consider a limited range of parameters so where a potential contaminant is not covered by the CLEA Model other relevant schedules for contamination assessment, such as the Dutch Guidelines, and professional judgement have been used.

COMMENTS

pH Value & Electrical Conductivity (salinity)

The sample was alkaline in reaction (pH 7.7) with a pH value that would be suitable for general landscaping purposes.

The electrical conductivity (salinity) value was moderate, which indicates that soluble salts should not be present at levels that would be harmful to plants.

Organic Matter & Fertility Status

The sample was found to be well supplied with organic matter and all major plant nutrients.

Particle Size Analysis & Stone Content

The sample fell into the sandy loam texture class. This particle size distribution (proportions of sand, silt and clay) would be suitable for general landscaping purposes.

The sample was slightly stony, and therefore stones will not restrict the use of the soil for landscaping purposes.

Potential Contaminants

Of the potential contaminants determined, none was found at levels that would indicate significant contamination.

CONCLUSIONS & RECOMMENDATIONS

The purpose of the analysis was to determine the suitability of the TOPSOIL sample for general landscaping purposes.

From the soil examination and laboratory analysis, the TOPSOIL sample was described as an alkaline, non-saline, slightly stony, sandy loam. The levels of organic matter and all major plant nutrients would be suitable for landscaping purposes.

To conclude, the topsoil would be suitable for landscaping purposes provided the physical condition of the soil is maintained.

Soil Handling Recommendations

It is important to maintain the physical condition of the soil and avoid structural degradation during all phases of soil handling (eg. Importation, stockpiling, respreading, cultivating). As a consequence, soil handling operations, including organic matter application, should be carried out when soil is reasonably dry and non-plastic (friable) in consistency.

In particular, it is important to ensure that the soil is not unnecessarily compacted by trampling or trafficking by site machinery. In addition, topsoil handling should be stopped during and after heavy rainfall, and not continued until the soil is again non-plastic in consistency. If, at any stage during the course of the soiling works, the soil is structurally damaged and compacted, it will be important to ensure that it is suitably cultivated to relieve the compaction and restore the structure prior to any planting, turfing or seeding.

We hope this report meets with your approval and provides the necessary information. Please do not hesitate to contact the undersigned if you have any queries or comments.

Yours sincerely

Helen Cooper
BSc, MSc, MSoilSci, CSci
Soil Scientist

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|---------|-------------------------------|
| Client | British Sugar plc Co-Products |
| Site | Wissington Factory |
| Our Ref | SLC/05/HC/1787 |
| Date | October 2005 |
| Suite | 1 & 2 |

WI/11-10-05/20mmA

pH Value & Salinity

| | | | | |
|--|-------|---|------|---|
| pH value (0.1N KCl extract) | units | G | 7.7 | ✓ |
| Electrical Conductivity (1:2.5 soil/water extract) | uS/cm | U | 1254 | ✓ |
| Electrical Conductivity (1:2.5 soil/CaSO4 extract) | uS/cm | U | 2760 | ✓ |
| Moisture Content | % | G | 17 | ✓ |

Organic Matter & Nutrient Status

| | | | | |
|------------------------|------|---|------|---|
| Organic Matter | % | U | 5.7 | ✓ |
| Total Nitrogen | % | U | 0.29 | ✓ |
| Extractable Phosphorus | mg/l | U | 66 | ✓ |
| Extractable Potassium | mg/l | U | 797 | ✓ |
| Extractable Magnesium | mg/l | U | 189 | ✓ |

Particle Size Analysis & Stones

| | | | | |
|----------------------|----------|---|----|---|
| Clay (<0.002mm) | % | U | 18 | ✓ |
| Silt (0.063-0.002mm) | % | U | 25 | ✓ |
| Sand (2.0-0.063mm) | % | U | 57 | ✓ |
| Texture Class | UK Class | U | SL | |
| Stones - 2-20mm | % by DW | G | 1 | ✓ |
| Stones - 20-50mm | % by DW | G | 1 | ✓ |
| Stones - >50mm | % by DW | G | 0 | ✓ |

Potential Contaminants

| | | | | |
|--|-------|---|------|---|
| Total Arsenic (As) | mg/kg | M | 9 | ✓ |
| Total Cadmium (Cd) | mg/kg | M | 0.3 | ✓ |
| Total Chromium (Cr) | mg/kg | M | 15 | ✓ |
| Total Copper (Cu) | mg/kg | M | 14 | ✓ |
| Total Lead (Pb) | mg/kg | M | 19 | ✓ |
| Total Mercury (Hg) | mg/kg | M | 0.05 | ✓ |
| Total Nickel (Ni) | mg/kg | M | 13 | ✓ |
| Total Selenium (Se) | mg/kg | M | 0.4 | ✓ |
| Total Zinc (Zn) | mg/kg | M | 40 | ✓ |
| Water Soluble Boron (B) | mg/kg | M | 2.8 | ✓ |
| Total Cyanide (CN) | mg/kg | M | <1 | ✓ |
| Total (mono) Phenols | mg/kg | U | <1.0 | ✓ |
| Elemental Sulphur (S) | mg/kg | M | <20 | ✓ |
| Acid Volatile Sulphide (S) | mg/kg | U | <1 | ✓ |
| Water Soluble Sulphate (SO4) | g/l | M | 0.4 | ✓ |
| Total Petroleum Hydrocarbons (C10-C40) | mg/kg | M | <50 | ✓ |
| Naphthalene | mg/kg | M | 0.2 | ✓ |
| Acenaphthylene | mg/kg | M | <0.1 | ✓ |
| Acenaphthene | mg/kg | M | <0.1 | ✓ |
| Fluorene | mg/kg | M | <0.1 | ✓ |
| Phenanthrene | mg/kg | M | <0.1 | ✓ |
| Anthracene | mg/kg | U | <0.1 | ✓ |
| Fluoranthene | mg/kg | M | 0.2 | ✓ |
| Pyrene | mg/kg | M | 0.2 | ✓ |
| Benzo(a)anthracene | mg/kg | M | <0.1 | ✓ |
| Chrysene | mg/kg | M | <0.1 | ✓ |
| Benzo(b)fluoranthene | mg/kg | U | <0.1 | ✓ |
| Benzo(k)fluoranthene | mg/kg | M | <0.1 | ✓ |
| Benzo(a)pyrene | mg/kg | M | <0.1 | ✓ |
| Indeno(1,2,3-cd)pyrene | mg/kg | U | <0.1 | ✓ |
| Dibenzo(a)anthracene | mg/kg | U | <0.1 | ✓ |
| Benzo(g,h,i)perylene | mg/kg | U | <0.1 | ✓ |
| Total PAHs sum US EPA 16 | mg/kg | U | <1.6 | ✓ |

Visual Examination

Very dark brown, slightly moist, friable sandy loam with a moderately developed fine to coarse granular structure. Slightly stony, no observable deleterious materials, including foreign matter (bricks, concrete, glass, metal, plastic) and roots or rhizomes of pernicious weeds (including couch grass, bindweed, Japanese Knotweed).

| | |
|----|---|
| ✓ | Meets General Landscape Specification |
| X | Fails General Landscape Specification |
| SL | Sandy Loam |
| M | MCERTS Accredited Method (& UKAS Accredited Method) |
| U | UKAS Accredited Method |
| G | GLP Accredited Method |