

APPENDIX 3 ENVIRONMENTAL SUPPORTING STATEMENT

Contaminated Land

The reports within the Environmental Statement which were reviewed for contaminated land and remediation issues include:

- Stirling Maynard (October 2004). *British Sugar Plc, Ipswich Factory Site: Report on Restoration / Remedial Works.*
- Stirling Maynard (June 2006). *JG Ipswich LLP, Broadmeadow Development: Environmental and Enabling Works, DRH/SJT/3883-01-08.*

Issues within these two reports are dealt with in Sections 1 and 2 below. Section 3 provides a brief review of the Budget Cost Comparison work outlined in the following report:

- Gleeds (October 2006). *Budget Cost Comparison: Mixed Use & Employment Developments for JG Ipswich LLP at Broadmeadow, Ipswich.*

Summary of Environmental Investigations

These reports, particularly those by Stirling Maynard, give an overview of the preparatory works undertaken at the site. There is a very brief mention of the Environmental Study and Investigation works undertaken in November 2001 which states that:

“...in general terms it concluded that the site contained concentrations of contaminants that are generally below human health guidance levels for commercial use. The exception was arsenic; but this was not assessed as posing a significant risk to human health and appropriate treatment can be undertaken to deal with this specific contaminant if residential development is proposed.”

The assessment of the site investigation data is summarised as suitable for commercial use though elevated arsenic was still noted. The statement indicates that treatment can be undertaken to deal with arsenic if residential use is proposed. The issue that other contamination issues may also need to be addressed for a more sensitive land use is not

brought forward in this report.

No information is given on how this assessment for commercial land use was undertaken and it should be noted that the assessment was undertaken in 2001 before the introduction of the CLEA model. This data would need to be reassessed in light of current planning requirements, if this has not already been undertaken.

Elevated biochemical methane potential was also measured and found to be elevated in a number of samples. Stirling Maynard indicates that these areas are capable of direct treatment in situ or by way of appropriate mitigation measures such as specialist materials or foundation design as part of the scheme redevelopment.

Ammonia was identified at the site associated with the processing of sugar beet and the pond areas including any related sludges e.g. effluent pond, settlement ponds and urea pond. It is understood that the water and sludges within these ponds have now been removed, dried on site and aerated and the material reused on site.

There is no indication of any desk based assessment to address the range of contaminants which may be present at the site or to focus a site investigation. There is very little information provided on the findings of the site investigation. Only certain items are highlighted (e.g. BMP and ammonia) though there is little or no information provided on any other issues identified, if any.

In addition, it is not clear whether the reuse criteria set for the dried sludge material from the ponds relate to a commercial end use or a residential end use.

Localised areas of elevated groundwater contaminants were identified above the UK Drinking Water Standards. Further detail on what contaminants are elevated is not provided.

Groundwater and gas monitoring standpipes were placed around the site perimeter and within the site to undertake long term monitoring. Stirling Maynard indicates that the findings will be discussed with the Environment Agency. No additional detail is provided with respect to contaminants of concern, length of monitoring period etc.

In May 2006, Stirling Maynard commissioned DTS Redburn on behalf of JG Ipswich LLP to undertake an assessment of ammonia concentrations within the groundwater from the long term monitoring which had been undertaken. DTS Redburn noted that concentrations of ammonia particularly in the south-eastern and south-western parts of the site were high. There is no indication of what these concentrations were assessed against. Generally speaking the identified areas seem to relate to where ammonia concentrations exceed 100mg/l. However, later on the report states that an Environmental Quality Standard of 0.6mg/l was agreed with the Environment Agency in 2001. When compared with this standard, elevated concentrations of ammonia are more widespread across the site. Based on this information, and coupled with the data to suggest that groundwater flow rates to the River Gipping are minimal, DTS Redburn identify two main 'hotspot' areas of ammonia concentrations in the groundwater beneath the site.

DTS Redburn undertook a Quantitative Risk Assessment using Environment Agency R&D Publication 20 to assess the risks from elevated ammonia in the groundwater. They looked at three scenarios in total; they modelled both "hotspot" areas as separate source areas and also modelled the remainder of the site. The target concentration chosen was that agreed with the

EA. DTS Redburn concluded that the QRA identified a “sufficiently low risk of significant harm to controlled waters as a result of the residual ammonia concentrations”.

There is no record of the monitoring results for the groundwater from 2001 to 2005 or how the decision was made that ammonia was the main contaminant of concern. No results or summary of the gas regime is provided either.

A quick comparison of the last groundwater monitoring results undertaken by DTS Redburn as part of their assessment indicated elevated concentrations of arsenic, nickel, lead and potentially some PAH compounds in addition to ammonia which may warrant further assessment. It is noted that the last sentence in the DTS Redburn report does state that “other contaminants at the site shall be covered separately at a later stage”.

From a brief look at the QRA, the distance to the compliance point input looks rather high and the dispersion calculation used is the least conservative. It is understood that this report is to be agreed with the EA.

Summary of Environmental Enabling / Remediation Works

Stirling Maynard state that all remediation / restoration works have been undertaken in accordance with the approvals from the EA where applicable and that EA officers have visited the site.

The objective of the works undertaken by Stirling Maynard was to remove the large volumes of water in the ponds across the site and to pre-treat where necessary (e.g. for ammonia) to meet EA discharge consents. Once the water had been removed, the pond areas were to be filled in to achieve an appropriately levelled site.

The remediation works proposed seem to relate to preparatory works and demolition rather than being focused on achieving a risk reduction / control for a particular land use scenario. No information is provided on how the works were to achieve a given standard for a particular end and use.

Demolition of some above and below ground structures had commenced by the time of the June 2006 Stirling Maynard Report however; the majority of the demolition was yet to be completed.

The works undertaken to date are summarised as follows:

- *Mud / Soil Ponds (No. 1 and 2)* – Sludge material was removed (some 20,000m³) and dried for reuse as fill.
- *Filled Southern Pond* – This was emptied in July 2002 and 92,000m³ of material removed. Stirling Maynard state that this material was “...variable and upon exposure it needed to be carefully monitored and selected for its suitability to remain on site.”
- *Filled Ash Pit in the South-West* – In August 2005 excavation began on the above ground mound of this ash pit. Different materials were encountered which were analysed and stockpiled separately. This resulted in a stockpile of factory soil suitable for direct use as on site fill material, a pile of wetter factory soil which was placed in windrows to be dried and then reused as fill and a third stockpile of variable material. However, during the excavation work some 2000m³ of sludge was also encountered. This was temporarily stockpiled on site and found to be similar in nature to the sludge from the effluent pond and

was therefore treated in the same manner (described in the next paragraph). Elevated nickel concentrations were identified and as such, Stirling Maynard proposes validation sampling in the area where this sludge has been placed. Trial pitting was undertaken in the ash pit to characterise this material. Boiler ash and wet factory soil was identified and so a number of boreholes were sunk to determine the risks to groundwater. Initial results and risk assessment indicate that the leachate concentrations are below remedial targets.

- *Effluent Pond* – The sludge within this pond was tested. A method statement for dealing with this material was agreed with the EA which involved spreading the material over the western part of the site incorporating it in the top layer of ground followed by mixing and aeration with agricultural discs to promote drying and ammonia release.
- *Urea Pond* – This material was tested and found not to be a source of contamination. Agreement with the EA was reached to remove this material and spread it thinly over flat areas and mix it with a layer of factory soil using agricultural harrowing equipment to enhance the nutritional value of the shallow soil.
- *Solar Pond* – This pond was pumped and the silty sludge layer at the base was sampled and found to be suitable to remain on site after drying.
- *Loco Shed Area* – No works considered necessary.
- *Buried Pulp Areas* – Buried pulp has been removed from site and the area validated.
- *Rubbish Tails Lime Waste Area* – No works considered necessary.
- *Tarehouse Area* – Buried asbestos containing materials (ACMs) were removed and the area validated.

The issue of selecting material for suitability for reuse is not defined. It is not clear if this material is assessed for engineering properties or for chemical classification purposes. As a result, it is not possible to determine at this stage whether the reused fill material across the site has been assessed for chemical contamination and, if so, whether any assessment was based on a commercial or residential land use scenario.

No further information is provided on the assessment around the ash pit. Risk assessment and testing have been carried out but no further details are provided.

No information is provided on why no works were necessary for some areas, such as the Loco shed area, which may have been sources of contamination. It may be the case that the site investigation did not identify contamination or that the contamination was below site assessment criteria in these areas but this is not clear from the report. Also, whether these areas were assessed as requiring no further work based on commercial or residential land use is not clear.

In November 2005 application was made to the EA for surrender of the two Waste Management Licenses i.e. the Lime Pond in the west of the site and the Waste Transfer Area in the south. The EA formally accepted surrender of both licenses in February 2006 and no further testing or monitoring is required.

Whilst this may be the case, the fact that contamination was noted in the groundwater means that there is a risk that these landfills may still be contributing to contamination of the area. Without details on the surrender, it is not possible to say that these areas no longer pose a risk.