

# Bioethanol Production Plant

## Non-Technical Summary

December 2007

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**vivergo**fuels




Vivergo Fuels Ltd

# Bioethanol Production Plant: *Non-Technical Summary*

December 2007

Reference 0067426

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<p>For and on behalf of Environmental Resources Management</p> <p>Approved by: Dave Ackroyd</p> <p>Signed: </p> <p>Position: Partner</p> <p>Date: 11 December 2007</p>
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## 1.1

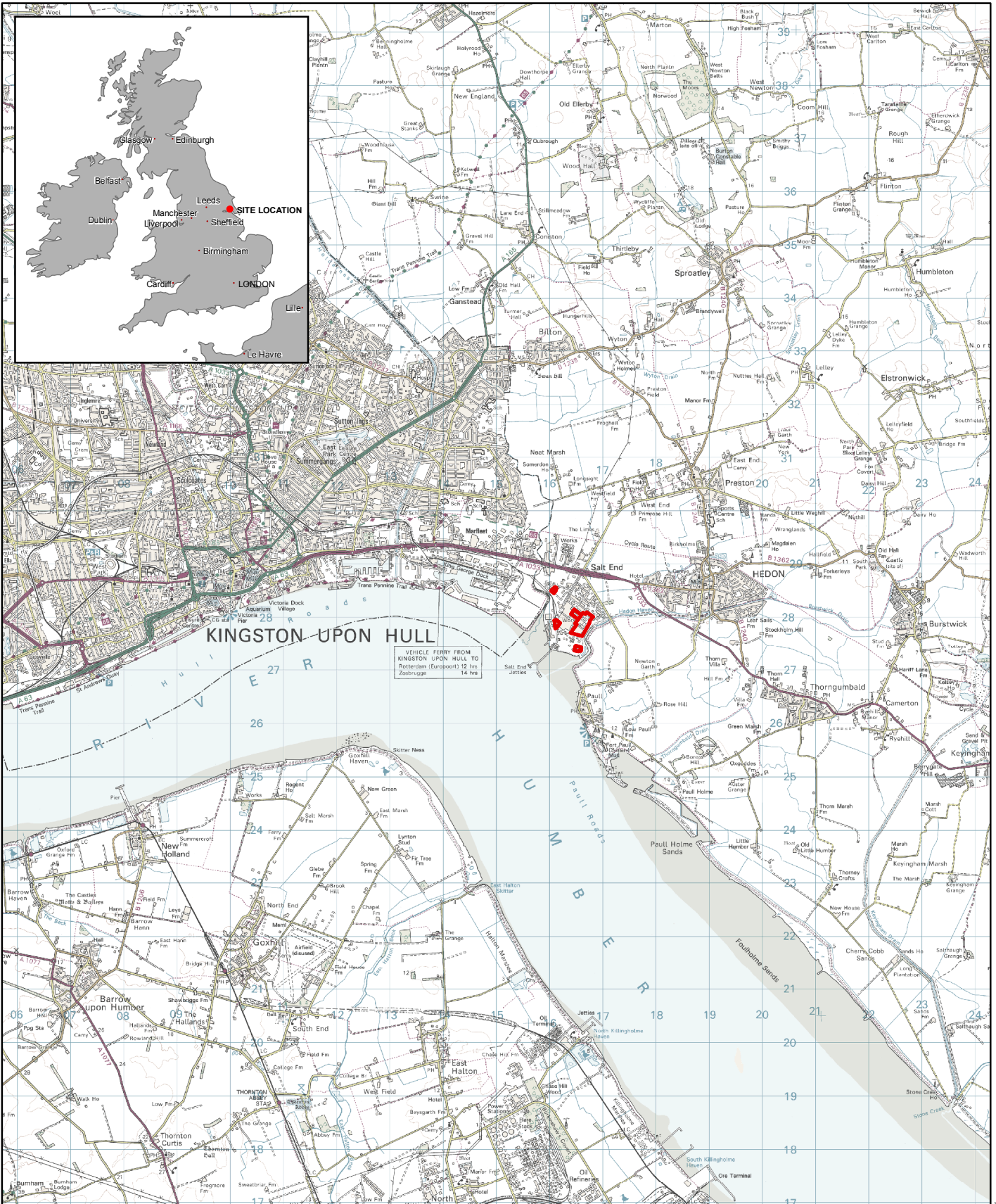
## INTRODUCTION

*This document is a summary, in non-technical language, of the Environmental Statement, undertaken by Environmental Resources Management (ERM) for a Joint Venture, Vivergo Fuels Ltd (Vivergo). It supports a planning application for a Bioethanol plant within the existing BP Chemicals site in Saltend, Hull (see Figure 1.1 for a plan showing the location of the site and Figure 1.2 showing the site boundary). The scheme falls under Schedule I of the Town and Country Planning (Environmental Impact Assessment) (England and Wales) Regulations 1999 and therefore an Environmental Impact Assessment (EIA) is required. The Environmental Statement (ES) reports the findings of the EIA. The key objectives of the EIA have been to:*

- establish and review the existing, or baseline, environmental conditions and policies which are relevant to the site of the scheme and the surrounding area;*
- identify and assess the environmental effects of the activities involved in construction and operation of the proposed scheme;*
- develop, in conjunction with Vivergo, measures that will be taken to remove, minimise or reduce these effects to acceptable levels; and*
- provide a framework for consultation with public authorities and interested parties.*

*In accordance with best practice and Government Guidance, consultation has been undertaken as part of the EIA process with those agencies and parties likely to have an interest in the proposed project.*





**KEY:**

- Permanent Site Boundary
- Temporary Site Boundary

0 2  
Kilometres

**CLIENT:** Vivergo Fuels

**SIZE:** A4

**TITLE:** Figure 1.1  
Location of Proposed Site

**ERM**  
Eaton House  
Wallbrook Court  
North Hinksey Lane  
Oxford, OX2 0QS  
Telephone: 01865 384800  
Facsimile: 01865 204982

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**PROJECTION:** British National Grid

<b>DATE:</b> 07/12/2007		<b>CHECKED:</b>	<b>PROJECT:</b> 0067426
<b>DRAWN:</b> IG		<b>APPROVED:</b>	<b>SCALE:</b> 1:100,000
<b>DRAWING:</b> ES_OverviewOfSite.mxd			<b>REV:</b> 0



## 1.2 THE PROPOSED DEVELOPMENT

### 1.2.1 Background

*The economic market for bioethanol is based largely on the fact that in April 2006, the UK Government announced the introduction of the Renewable Transport Fuel Obligation (RTFO) that will require the incorporation of biofuels into existing road transport fuels from 2008. The target for fuel blending in the first year is 2.5% rising to 3.75% in 2009 and reaching 5% in 2010. The RTFO has been introduced by the UK government in response to European Union (EU) legislation (Article 3 of Directive 2003/30/EC) that requires that Member States promote the use of biofuels or other renewable fuels for transport such that:*

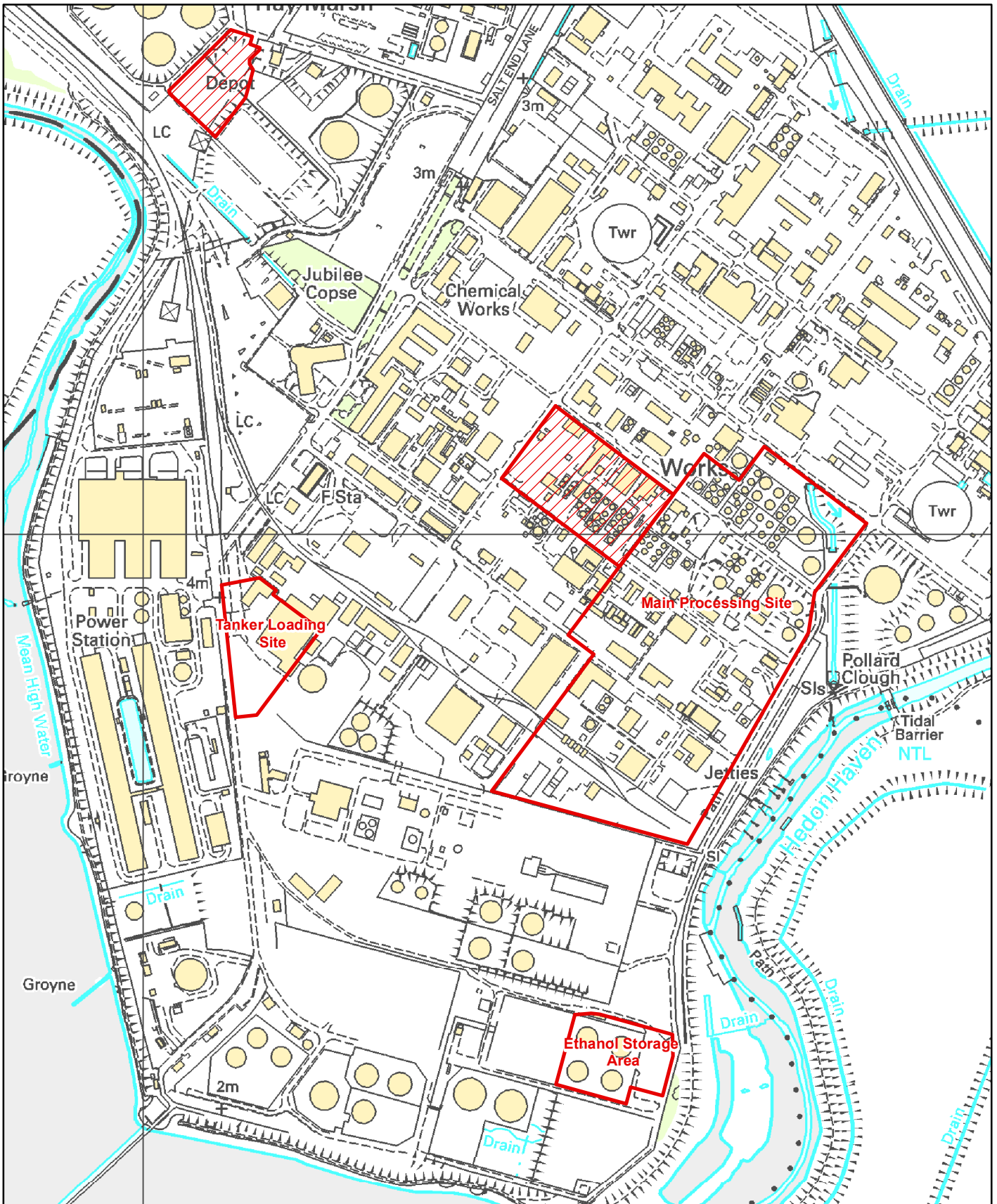
- *“1. (a) Member States should ensure that a minimum proportion of biofuels and other renewable fuels is placed on their markets, and, to that effect, shall set national indicative targets.*
- *(b) (i) A reference value for these targets shall be 2 %, calculated on the basis of energy content, of all petrol and diesel for transport purposes placed on their markets by 31 December 2005.*
- *(ii) A reference value for these targets shall be 5.75 %, calculated on the basis of energy content, of all petrol and diesel for transport purposes placed on their markets by 31 December 2010.”*

*This EU commitment has, more recently, been extended and strengthened in “The Energy Challenge” (2006) which announced the Government’s intention to exceed the targets set out in the RTFO. The proposed Vivergo project will contribute towards achievement of these targets by making bioethanol available for addition to petrol by 2010.*

*In addition, wheat is one of the most reliable and productive crops to be grown in the UK, and the country as a whole produces an exportable surplus. The production of bioethanol will provide a new market for wheat, helping to sustain the regional farming economy. The decision to locate the Project in the Hull area is based, in part, on the fact that the region is a significant wheat producing area with approximately 700,000 tonnes of wheat being exported from the Humber ports annually.*

### 1.2.2 Project Description

*The proposed Bioethanol development site consists of an approximately 13 ha development which is currently unused ‘brownfield’ land located, within the eastern portion of the wider BP Saltend site. The bioethanol development comprises a main central processing area (10 ha) and two much smaller satellite areas (approximately 1 ha each) to provide bioethanol storage and road tanker loading facilities. The three sites will be joined by interconnecting pipelines and cables. Further pipelines/cables will be required to connect the main site to the necessary BP Saltend utilities.*



KEY:

- Permanent Site Boundary
- Temporary Site Boundary

0      150  
Metres

CLIENT: **Vivergo Fuels**

ERM  
Eaton House  
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PROJECTION: British National Grid

SIZE: **A4**

TITLE: **Figure 1.2  
Bioethanol Plant Layout**

DATE: 10/12/2007	CHECKED: CW	PROJECT: 0067426
DRAWN: IG	APPROVED:	SCALE: 1:6,000
DRAWING: <b>ES_SiteLayout.mxd</b>		REV: <b>0</b>

Fig. 0067426BPSUBENL\_CGISMapAESSES\_SiteLayout.mxd

*In addition to space allocated on the main development site, a temporary contractor logistics area (1 ha) will be provided to the west of the road tanker loading area. The location of the various Bioethanol plant areas is shown in Figure 1.2. The main elements of the plant will consist of:*

- *Wheat storage silos, approximately 34 m high;*
- *Dried Distillers Grains loading silos, approximately 36 m high;*
- *Distillation columns, approximately 34 m high;*
- *Vents; approximately 25 m high; and*
- *General buildings; approximately 10 m high.*

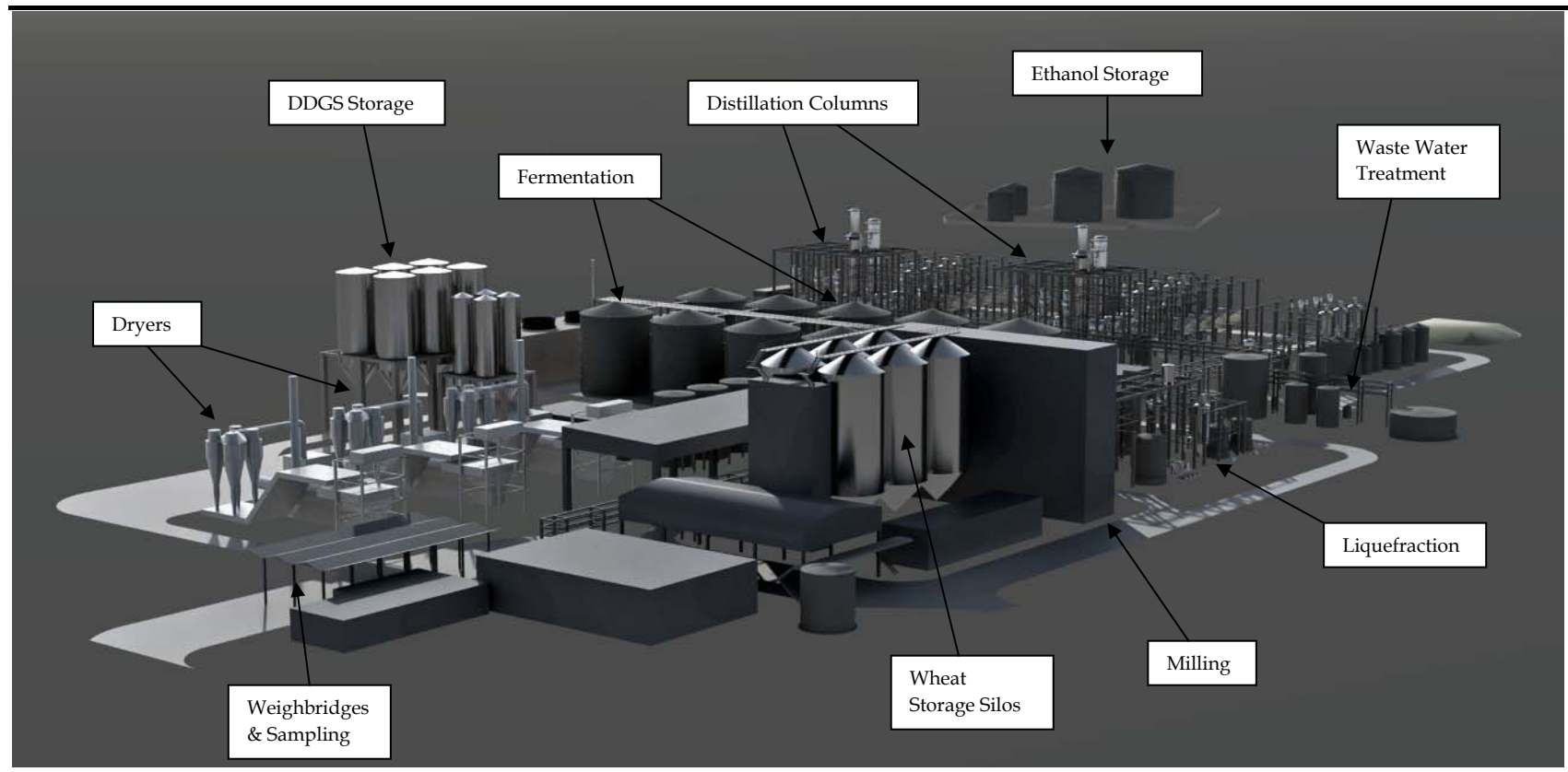
*A computer model of the plant is shown in Figure 1.3.*

*The infrastructure (and associated activities) proposed in the main process area is as follows and described in Figure 1.3:*

- *Wheat Unloading and Storage;*
- *Wheat Milling;*
- *Ethanol Process Area;*
  - *Liquefaction;*
  - *Fermentation;*
  - *Distillation & Dehydration;*
  - *Evaporation;*
- *Decantation;*
- *Dried Distillers Grains (DDGS) Drying;*
- *DDGS Pelletizing; and*
- *Wet Cake / Syrup / DDGS Storage and loading.*

*There will be two sites allocated for use during the construction phase of the project as laydown and logistics areas, one will utilise a section of the main process site and the second lies to the west of the road tanker loading area. The first stage of the construction process will be the civil engineering works required to level and prepare the site such that the infrastructure required for the Bioethanol plant can be constructed and installed.*

Figure 1.3 3D Computer Model of the Bioethanol Plant



*The main construction activities predicted during the civil works are as follows:*

- *Piling and installation of foundations, all piling will be augered (the action is similar to a large corkscrew) rather than a percussive (hammered) method to minimise noise emissions and prevent excessive ground disturbance;*
- *Use of portable air compressors for hand tools (jack hammers, concrete agitators etc);*
- *electric / air / petrol driven cutting machines (angle grinders, saws, circular saws etc) for cutting reinforcing bars and timber;*
- *crane activities; and*
- *concrete offloading from trucks and concrete pouring and levelling.*

*These activities will be common to the main processing site and the two satellite areas (ethanol storage and road tanker loading).*

*Following the completion of the civil works to prepare the site, the installation and construction of the main infrastructure will commence. This is likely to include:*

- *diesel powered electrical generators for temporary power supply;*
- *diesel powered welding plant;*
- *portable air compressors;*
- *crane activities;*
- *mobile elevated work platforms;*
- *fork lift trucks, rough terrain vehicles; and*
- *hand tools for installation of steel plates on tanks etc.*

*These activities will be carried out at all three of the sites, but the most intensive activity will be on the main processing site. It should be noted that tank erection activities are presently taking place in the area immediately to the south of the proposed ethanol tank storage location. These tanks are being constructed using a 'jack-up' technique which limits work to ground level and therefore assists with reducing potential noise and disturbance impacts off-site. Vivergo intends to construct the ethanol storage tanks using the same technique.*

*It is envisaged that, subject to the necessary consents being obtained, civil construction works for the proposed facility would start in April / May 2008, lasting for approximately 18 months, with mechanical engineering completion and commissioning scheduled for Dec 2009. The plant is proposed to be operational by January 2010.*

### **1.2.3**

#### ***Planning and Land Use***

*A review of the relevant policy documents has been undertaken. The proposed Bioethanol plant is fully in accordance with land-use allocations and environmental criteria in National Planning Policy Guidance/Statements, the Regional Spatial Strategy for Yorkshire and the Humber to 2016 based on Selective Review of RPG12 –*

2004, the Joint Structure Plan for Kingston upon Hull and the East Riding of Yorkshire 2005, and the Holderness Local Plan 1999. The proposed bioethanol plant fulfils the Government's commitment to exceed the targets set out in the RTFO.

### **1.3 SHORT TERM CONSTRUCTION EFFECTS**

*The short term construction effects are those deemed to be effects that persist for a limited period only due to construction activities such as the use of construction plant or the movement of construction materials and workers. However, construction effects will vary throughout this period as different activities take place. Details of the type of activities have been described and the key aspects are described in the following sections.*

#### **1.3.1 Socio-economics**

*Socio-economic effects arising during the construction phase will relate to employment generated by the construction process, involving direct employment on site, plus indirect and induced employment effects within the local economy.*

*It is anticipated that over 1 million man hours will be needed during the construction phase. The construction contractor workforce is expected to peak at about 400 people. Approximately 20% of the workforce is expected to be sourced locally*

*Temporary construction jobs will support further employment in the local economy, through indirect or supply chain effects and induced or income multiplier effects. Using a standard multiplier, the additional gross temporary employment generated in the local economy is estimated to be 48 full time equivalent jobs.*

#### **1.3.2 Air Quality**

*Data from monitoring results taken from the area, shows that none of the pollutants assessed exceed any air quality limit values and thus the background air quality is good.*

*It is not expected that there will be significant impacts upon ambient air quality arising from construction activities either in traffic generation or emissions to atmosphere from the construction site. The main aspect of the assessment therefore investigated the potential nuisance effects from dust caused by construction activities. The main consideration with respect to dust is one of soiling at residential properties. A Code of Construction Practice (CoCP) will be employed by the contractor. Good site practices employed during the construction period will minimise the generation and emissions of dust. Proposed mitigation will include aspects such as controlling traffic speeds to 15 mph on unhardened roads, water sprays on material stockpiles in dry weather and sheeting of lorries transporting friable construction materials.*

*In combination with good site management, it is considered that the distance to residential receptors is sufficient to ensure that dust emissions resulting from the construction activities are unlikely to be significant.*

### 1.3.3 *Archaeology and Cultural Heritage*

*As part of the EIA, a desk-based study of the potential effects on archaeology and cultural heritage as a result of the proposed extension was undertaken using existing documents and maps. The study showed that there are no Listed Buildings or Conservation Areas near the site. However, two archaeological artefacts have been found in the vicinity of the proposed Bioethanol plant. Both are on the banks of the Hedon Haven to the east of the proposed redline boundary.*

*In 1996-1997, the Environment Agency built flood defences along the banks of the Hedon Haven. Since this development, no evidence of either feature has been found. No other Scheduled Ancient Monuments have been found within 100 m of the proposed site. It is anticipated that construction of the proposed development will have no significant effects on archaeology or cultural heritage. As part of the CoCP, a watching brief will be maintained by the contractor during any excavation works.*

### 1.3.4 *Ecology and Nature Conservation*

*The assessment of ecology and nature conservation in the ES is based on field and desk study results and consultation with relevant organisations. The studies showed the proposed development is not within sites designated for nature conservation value however, the Humber Estuary, which this site is adjacent to, is designated a Special Protection Area (SPA), Ramsar site and candidate Special Area of Conservation (SAC). No designated sites will be directly or indirectly affected by the proposed development during construction.*

*Construction activities within the proposed development sites will predominantly affect existing hardstanding and remediated areas, but will result in the permanent loss of small amounts of isolated habitat, including ephemeral/short perennial vegetation and tall and ruderal vegetation typical of pioneer vegetation in disturbed areas and are considered to be of low ecological value. Adjacent habitats of higher ecological value will not be directly affected by construction.*

*There will be no direct loss of habitat and hence existing feeding and roosting habitats will not be lost. The main impacts are therefore likely to arise from disturbance to birds (eg due to noise, presence of people) and any displacement from feeding or roosting areas which may occur as a result. The construction phase is, however, short term and it is anticipated to last approximately 18 months commencing in late spring early summer 2008. A Code of Construction Practice (CoCP) will be drawn up for the contractors to minimise any effects to the adjacent habitats.*

*Views of the construction work from the main feeding and roosting areas around Old Fleet Drain used by birds at high tide will also be partially screened by the existing power station buildings, which lie along much of the western side of the BP Saltend site.*

*The ethanol storage is located closer to the mudflats than the main process site, however, the tanks that will be created on this site will be built using a jack-up technique. This will ensure that all the construction work is undertaken from the ground up, and hence much of the construction works and all the site personnel will be hidden from view by the flood defence embankments and other existing facilities on*



*the southern margins of the BP Saltend site. This will minimise any potential disturbance.*

*No protected species have been found on the development sites. Several potential bird breeding habitats were identified in the vicinity of the site but none were found within the red line boundary. The construction of the proposed development is not considered likely to have a significant impact on birds in the area.*

*In terms of cumulative impacts, there are two other proposed developments to be constructed within the vicinity of the proposed development. However, given that one of the projects is planned for construction outside the proposed Vivergo construction period and the second is approximately 900 m distant from the Bioethanol development and more distant from the estuary, no significant cumulative impacts in terms of ecology are predicted to occur as a result of the proposals.*

### **1.3.5 Water Resources and Flood Risk**

*No abstractions are considered to be required to meet the construction water demands of the project, and no impacts are therefore anticipated.*

*If any potential contaminants or contaminated groundwaters were to be mobilised, impacts to water quality would not be anticipated to be highly significant. This is mainly due to the location of the site and the lack of a direct pathway to surface watercourses.*

*Construction impacts will be minimised by ensuring that all works will be conducted in accordance with the requirements of relevant regulations and PPGs, such as PPG1: General Guide to the Prevention of Pollution, PPG5: Works In, Near or Liable to Affect Watercourses and PPG 6: Working at Construction and Demolition sites. Regulatory requirements and the measures outlined within these PPGs will be integrated with the CoCP.*

*Specific measures will be considered to prevent the entry of construction materials (eg sediments and dusts) to the open section of Preston New Drain. This will include the adoption of buffer zones.*

*Appropriate waste handling, storage and disposal procedures will be implemented to prevent the mobilisation or entry of any wastes to surface water or groundwater.*

*No changes are planned to the estuarial floodbanks during construction, so the nature of the protection afforded will not be compromised. Internal site drainage during construction will utilise the existing BP Saltend site treatment facilities thus no impacts are predicted for adverse water quality impacts or internal site flood risk from rainfall events. A range of mitigation measures will aim to reduce the risk of flooding to ALARP levels.*

### **1.3.6 Contaminated Land and Waste Management**

*The site is of brownfield condition, having been used for industrial production for the past 50 to 60 years.*

*The risks of existing pollution being present on the site will have been minimised through site remediation both on the BP Saltend site as a whole and the proposed development site specifically. However, as with any remediated site, there remains a residual risk that construction works, could mobilise potential contaminants or provide new pathways through which contaminated groundwaters could migrate. The construction of the Bioethanol plant will incorporate a range of mitigation measures which will include a programme of site remediation prior to the commencement of the construction activities*

*Site assessment and remediation programmes have been undertaken by consultants Carl Bro and MWH, the results of these studies indicate generally low concentrations of the parameters analysed in the soils and groundwaters on the site. A number of samples showed elevated concentrations of hydrocarbons, typically in ground associated with storage and production of chemicals.*

*Mitigation measures include the removal/treatment of contaminated soils/capping with topsoil, hardstanding and the possible installation of gas impermeable membranes.*

*Vivergo/contractor will make provisions to ensure that all hazardous substances including oil drums or containers on site are controlled in accordance with COSHH regulations, are labelled appropriately and have a suitable Spill Contingency Plan in place.*

*As a result no significant impacts are predicted during construction.*

### **1.3.7**

#### ***Landscape and Visual***

*The landscape and visual impact assessment in the ES was prepared in accordance with good practice and included a site visit and analysis of particular views (known as 'key' views) from areas accessible to the public (eg footpaths and playing fields). In addition consultations were carried out with a number of organisations in order to obtain information about the landscape and visual character of the area.*

*The proposed bioethanol plant is located within the large scale industrial development of BP Saltend. The total development site area is an approximately 13 ha in total, which comprises unoccupied brownfield land. The landscape quality of the site is low and sensitivity to change is low.*

*Landscape and visual impacts will occur in the short term as a result of alterations to the landscape during the 18 month construction period. The impacts will be phased, temporary and restricted to the construction period, thus the duration of the resulting landscape and visual impacts will also be temporary. Mitigation measures that will be adopted include the appropriate storage and removal of construction plant (including cranes) and appropriate lighting to minimise offsite light impacts whilst retaining a safe and secure site.*

### 1.3.8

#### **Noise and Vibration**

*The assessment of noise and vibration in the ES addressed the potential of the construction of the proposed development to effect local noise and vibration sensitive receptors. Background noise measurements showed that noise levels on the Saltend mud flats were typically lower than at receptors on the Hull road.*

*Noise measurements by BP were made at intervals around the site boundary including the side facing the mud flats. The lowest noise levels were recorded along the southern boundary of the site with the SSSI/SPA. The short-term noise levels ranged from 40 to 47 dB(A) during this survey. However, the longer term monitoring suggested that the average 24 hour  $L_{Aeq}$  was more likely to be between 60 and 65 dB.*

*Noise levels from the construction of the proposed development were estimated for the closest noise sensitive receptors (NSR). It is recognised that the construction phase will give rise to additional noise from activities such as civil activities eg augered piling and crane activities and mechanical activities eg compressors, cranes and generators.*

*Predicted noise levels at the residential receptors generated by the three main construction sites are below the assessment criteria and therefore no significant impacts are expected.*

*The project scope includes a number of substantial site-built tanks which are located closer to the SSSI/SPA than the remainder of the facility. In order to eliminate significant working at height and thereby eliminate the nuisance hazards of noise and light from high level welding and tank fitting, plus significant high level craneage the project has selected 'tank jacking' as the technique for site built tank construction. This technique involves constructing the roof at ground level and jacking up from the base to form the sides thereby allowing the majority of activities to be conducted at ground level. This methodology is consistent with the technique currently being employed by BP Chemicals for construction of neighbouring site built tanks.*

*Due to the large distances between the residential Noise Sensitive Receptors (NSR) and the sites of construction works, no impacts are predicted during any phase of the construction programme at these receptors. Construction work may, from time to time, be audible, however predicted unmitigated levels of construction noise are below the assessment criteria of 75 dB and no residual impacts are expected to occur. Noise levels at ecological receptors during the construction phase may produce a variable response from the bird species that inhabit the SSSI / SPA. These impacts have been classed as Slight to Moderate. The construction phase will be a temporary disturbance.*

### 1.3.9

#### **Traffic and Transport**

*The traffic assessment in the ES was conducted by JMP Consulting Ltd., based on a review of existing traffic, transport and accessibility conditions in the vicinity of the plant according to criteria based on current guidance on transport appraisal.*

*The potential impact of construction traffic has been minimised by phasing the deliveries and site staff arrival for work and departure from site outside of the existing*

*peak travel hours. The assessment shows that during the morning, the base traffic flows on the highway network during the peak hour for construction movements to and from the site (0600 to 0700 hours) are significantly lower than the base traffic flows during 0700 to 0800 hours and 0800 to 0900 hours.*

*On Castle Street, one of the most congested sections of the local highway network, the total flow on the eastbound carriageway including 38 construction trips, is over 1000 vehicles less than 0700 to 0800 hours and 0800 to 0900 hours.*

*The highest accumulation of construction trips during the morning on one section of the highway network is on the eastbound carriageway of the A1033 Hedon Road (west of Southcoates Lane), with 64 vehicles travelling to the site. The impact is negligible since the baseline traffic flow here is only 771.*

*In the evening, the majority of the construction trips leaving the site are generated during 1700 to 1800 hours. On Castle Street, the baseline traffic flow in a westbound direction is 1,272, and therefore an additional 30 trips are unlikely to have any significant impact.*

*The highest accumulation of construction trips during the evening on one section of the highway network is on the westbound carriageway of the A1033 Hull Road (east of Saltend Roundabout) with 56 vehicles leaving the site. The impact is negligible since the baseline traffic flow here is only 914.*

*Mitigation measures will include:*

- A Construction Traffic Management Plan will be submitted for consultation to East Riding of Yorkshire Council, Hull City Council and the Highways Agency before commencement of construction;*
- the routes identified as suitable for construction vehicles and the time periods in which HGV's can access the site will be adhered to i.e. no HGV movements in the peak hours (0700 to 0900 hours) and 1600 to 1800 hours) along the A63 / A1033 corridor;*
- materials and equipment will be stored securely onsite to minimise unnecessary traffic movements;*
- The use of construction employee minibuses and other methods by which to reduce the number of vehicle movements to and from the site will be considered.*

*In summary, although some of the increases due to the construction traffic on the network are above the stated 5% threshold for a sensitive network, or above the 30 two way trips, the increases are generally outside of the network peak hours and therefore are not considered to cause a significant impact pursuant to the IHT Guidelines.*

### 2.1.1 *Socio-economics*

*It is estimated by Vivergo that approximately 80 permanent jobs will be created by the project, of which 50 will be operational shift workers required on site plant operation and maintenance. The Bioethanol plant will also provide indirect employment through use of hauliers, engineering contractors and local service providers. It is intended that the workforce will be sourced locally where appropriate. Vivergo is currently engaged in discussions with East Riding of Yorkshire Council to discuss how best to maximise employment locally.*

*The sourcing of wheat from local farmers in the area for the bioethanol plant will provide an additional market for grain and will underpin the existing regional agricultural industry in a sustainable way.*

*Using standard multipliers, it is anticipated that 184 new full time equivalent (FTE) jobs will be generated in the local economy, including drivers for HGV deliveries of wheat and other supplies. A more significant number of FTE jobs (840) will also be supported throughout the UK.*

### 2.1.2 *Air Quality*

#### *Operational Traffic*

*The impact of operational road traffic on air quality is considered to be negligible as the incremental volume of operational traffic is not significant (< 10%) when compared to the baseline traffic.*

#### *Shipping Traffic*

*Air quality impacts due to shipping emissions are not considered to be significant at the Saltend jetty and along the River Humber based on the assumptions made*

#### *Dust during Grain Receiving/ Handling, Milling and Loading Activities*

*The impact of dust emissions during grain receiving/ handling, milling and loading activities are not expected to be significant due to dust mitigation measures (ie dust filtering system) that will be in place. High efficiency de-dusting cyclones will be fitted to control dust emissions from the dryers.*

#### *Stack/ Vent Emissions*

*The incremental emissions to air from the operation of the proposed Bioethanol plant station are expected to result in non-significant impact to human health as the predicted Ground Level Concentrations are well within the air quality assessment criteria.*

*In evaluating NO<sub>x</sub> concentrations, nitrogen deposition and acid deposition, incremental impacts upon Humber Estuary are not considered to be significant as the values are small when evaluated against the assessment criteria.*

### *Odour*

*Results from atmospheric modelling have indicated that whilst there is potential for odorous emissions from the plant, the proposed mitigation of the addition of a wet scrubber system and thermal oxidisers will minimise odours and it is not considered likely that significant odour impacts will be experienced at the identified receptors.*

### *Plume Visibility*

*The plume visibility impacts from the dryer stacks steam plume are considered to be high according to the technical criteria set by the Environment Agency. From a visual perspective as viewed in context from Eden Roc, the plume visibility impact is deemed to be moderate.*

## **2.1.3 Archaeology and Cultural Heritage**

*No significant archaeological resources have been identified within or in the immediate vicinity of the proposed Bioethanol plant; therefore no adverse residual impacts are anticipated. No impacts are predicted to occur to listed buildings, Conservation Areas or Historic Parks and Gardens as none are within a kilometre of the proposed site.*

## **2.1.4 Ecology and Nature Conservation**

*The operation of the Bioethanol plant on its own will not result in any significant ecological impacts.*

*The Bioethanol development site supports little habitat of value to breeding bird species. Once operational there will be no habitat within the development site to support bird species, and the Bioethanol plant will not have significant impacts on birds using surrounding habitats.*

*The findings of the assessment indicate that on its own, the bioethanol plant will not have a significant impact on important habitats for nature conservation, especially sand dunes and saltmarsh which are qualifying interest habitats of the European designated site along the Humber. All incremental increases due to the plant when compared against the critical levels or loads for nitrogen and acid are 1% or less.*

*The air emissions from the predicted road traffic movements and shipping movements at the BP Saltend jetty are not predicted to be significant.*

*The noise levels resulting from the operational plant will be due to regular noise events and are predicted to be up to 59 dB(A) at Hedon Haven, with lower levels in many areas. No significant impacts to feeding or roosting waterfowl are predicted.*

*Given the continued use of feeding and roosting by waterfowl areas despite the development of similar size plants much closer to the mudflats, impacts caused by visual disturbance are not predicted.*

*An increase of up to 24 ships a month (i.e. 288 per year) will still be much lower than the levels which have operated in the past, and during which birds have continued to use the mudflats. Significant impacts on birds due to shipping increases are not predicted.*

*The Bioethanol plant will not result in the direct loss of any habitats of nature conservation importance, and in particular it will not affect any of the habitats which form part of the qualifying interest of the European designations along the Humber Estuary.*

*A number of other projects are planned in the area and cumulative impacts have been assessed.*

*The Energy from Waste (EfW) plant is a further 900 m inland and to the north of the Bioethanol plant. It is unlikely to have significant impacts on birds from the Humber Estuary.*

*Of the approved projects there is no indication that construction of Quay 2005 is about to proceed, despite the project having been given consent. The Humber Quays Phase 2 project has received outline planning consent. Construction work is expected to proceed in autumn 2008 and last for 12 months. It is, therefore, likely that this development will be ongoing at the same time as the bio-ethanol plant. However, given that the bio-ethanol project is predicted to have little impact on birds, the cumulative impacts are not predicted to be significant.*

*The Humber Bundle Pipelines Project (BP Chemicals, Total UK Ltd, Lindsey Oil Refinery, ConocoPhillips Ltd and BOC Ltd) is located adjacent to Paull Road, however, BP has indicated that this is unlikely to proceed before 2009.*

*There are proposals for a Hull Riverside Bulk Terminal facility which will include a new jetty into the Humber Estuary however, an application for consent has yet to be submitted. It is expected that the cumulative impacts of this proposals will be considered as part of that application.*

*Significant cumulative impacts are not therefore predicted.*

### **2.1.5 Water Resources and Flood Risk**

*The facility will utilise a combination of Towns Water and recycled process water to minimise water consumption. Potential impacts to the water environment have been significantly reduced by the location of the plant within the BP Saltend site. This is due to the ability to use, and dispose of, waters to existing systems, namely the site treatment plant "Aquarius". The high specification of the proposed and existing surrounding drainage systems and the low porosity and permeability of the site also reduces the potential for pollution mobilisation, whilst the risks of release will be controlled by detailed procedures and operational controls.*

*The main risks identified are associated with the location of the site within Flood Zone 3. However, this risk is considered to be being managed to a large extent through the commitment of the EA, local industry and the Humber Flood Risk Management*



*Strategy to protect and reduce the risk of inundation to Humberside's residential and industrial area.*

*Drainage from roofs and hardstanding will be conveyed to the BP site drainage system prior to discharge. Process waters will be treated in an on-site treatment plant and either re-used as process water or conveyed to "Aquarius". With appropriate engineering design of the operational site drainage, no onsite or offsite operational impacts are predicted. The site is contained behind the Humber Estuary flood defence bunds at Saltend. These defences are designed and maintained by the Environment Agency. No impact is predicted from estuarial flooding.*

## **2.1.6 Contaminated Land and Waste Management**

*The review of previous site investigation reports has identified that, for the development sites, there are localised areas yet to be remediated. In order to mitigate this aspect, further investigation works will be necessary to delineate any potential contaminant areas within the unremediated areas and determine what works are required.*

*A programme of site investigation and remediation works are planned and should be completed prior to the development commencing. Appropriate verification reports will be provided to confirm soil, soil gas and groundwater quality following these works.*

*The operation of the Bioethanol plant will incorporate a range of mitigation measures which will include a programme of site remediation, prior to the commencement of the construction activities. The completed development would have a beneficial impact due to the capping/localised removal of contaminated soil. As a result no significant impacts are predicted during operation.*

## **2.1.7 Landscape and Visual**

*In summary, there will be a small number of minor landscape and visual impacts as a result of the Vivergo development. However, the existing landscape of the area is developed and industrial in nature. As a result of this and the type of development proposed, impacts are largely of minor significance or of no significance.*

*There will be no significant direct loss of landscape resources, on or outwith the site, as a consequence of the proposal. Similarly, there is no significant impact on the landscape and townscape character areas within the study area.*

*With regard to visual impact, it is considered that from the majority of visual receptors there will either no significant impacts, or minor impacts.*

*It is considered that residential receptors at Paull and Eden Roc will incur a visual impact of minor significance from the new buildings.*

*The dryers will emit steam plumes from the vents. These have been modelled and a maximum extent of approximately 600 m was calculated. This has been the basis for the photomontage assessment. It is considered that the impact of this worst-case assessment is moderate.*

*The bioethanol plant will generate a number of steam plumes. These have been modelled and the results presented in the Air Quality assessment. A visual representation of the plumes has been presented in the photomontages. From a visual perspective as viewed in context from Eden Roc, the plume visibility impact is deemed to be moderate. However according to Environment Agency technical guidance, the generation of such plumes by the dryers is deemed "high" and will require further technical justification.*

*The existing buildings will predominantly screen the proposals when looking from the west and north, and partially screen the infrastructure when looking from the south. Due to the flat low lying nature of the surrounding landscape, buildings and vegetation at a local level including hedgerows along country lanes, will also dramatically reduce the visibility of the proposals. The building finishes will be grey for the building cladding and metal finish for tanks and exposed pipework.*

### **2.1.8 Noise and Vibration**

*Noise levels from routine operation of fixed plant is not likely to result in significant off-site noise effects either at residential locations or at the SSSI/SPA at Saltend mud flats. Noise levels from the operation of the plant are predicted to produce a Slight to Negligible impact.*

*In order to control noise emissions during the operational phase, standard on-site noise control measures will be employed to ensure that the criteria are not exceeded. These typically include ensuring that all plant and equipment is routinely maintained and that acoustic enclosures are provided where deemed necessary.*

*The plant logistics have been designed such that there will be no requirement for trucks to reverse in the process and loading areas thus there will be no reversing sirens in routine operation.*

### **2.1.9 Traffic and Transport**

*The traffic assessment in the ES was conducted by JMP Consulting Ltd based on a review of existing traffic, transport and accessibility conditions in the vicinity of the plant according to criteria based on current guidance on transport appraisal.*

*In summary, although the increases on the network are above the stated 5% threshold for a congested network, the increases due to the operational traffic are generally outside of the network peak hours and therefore are not considered to cause a significant impact pursuant to the IHT Guidelines. The two-way development trips are not predicted to be above 30 at any one section on the highway network.*

*A number of mitigation measures will be adopted to reduce the impacts from the operational traffic:*

- *An Operational Traffic Management Plan will be submitted for consultation to East Riding of Yorkshire Council, Hull City Council and the Highways Agency before commencement of the plant operation;*

- *the routes identified as suitable for operational wheat and DDGS HGVs and the time periods in which such HGVs can access the site will be adhered to i.e. no HGV movements in the peak hours (0700 to 0900 hours and 1600 to 1800 hours) along the A63 / A1033 central Hull corridor;*
- *Methods by which to reduce the number of vehicle movements to and from the site will be considered.*

## 2.2

### SUMMARY AND CONCLUSIONS

*Having regard to the assessment contained in the ES, it is not considered that the proposed Bioethanol plant will have either significant long or short term adverse effects on atmospheric emissions, traffic, noise and vibration, nature conservation and biodiversity, land contamination water resources, socio-economics or archaeology and cultural heritage. With respect to landscape and visual impact, the operational plant and associated storage and loading facilities will not create an adverse impact, when viewed from representative residential viewpoints. The discharge emanating from the grain dryers is deemed to be of moderate significance from a visual perspective but is deemed to be a high impact process discharge when utilising technical guidance from the Environment Agency. Further detailed design of the dryers could reduce this magnitude of the plume and therefore the impact.*

*The total number of vehicles on the highway network with the addition of the construction or operation traffic remains well below peak hour levels. It is expected that there will be enough capacity to accommodate these extra vehicles on the highway network.*

*In conclusion, the EIA has outlined that the Saltend site is appropriate for the Bioethanol plant.*

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